A STUDY OF PAY AT THE WASHINGTON POST

November 6, 2019

THE WASHINGTON POST
GUILD

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INTRODUCTION

Washington Post employees work every day to ensure that our company is a leader in the journalism industry. Members of our company's union, The Washington Post Newspaper Guild, believe The Post should also lead the way in how it treats its staff.

We want to foster an environment where all people, regardless of their gender, race, religion, sex, age or job, feel they are heard, respected and paid fairly.

Our company has expressed a commitment to these values. But the members of the Post Guild believe that true progress can only be achieved when we begin with the facts. And the facts tell us that The Post has a problem with pay disparity.

The Post has never conducted and released to the public a comprehensive pay study of its own. So this year, Post Guild decided to do one itself.

Our union contract with Post management mandates that the company give us pay data on Guild-covered employees on an annual basis. We requested this information in July 2019 and spent four months analyzing the data, a reporting effort led by Pulitzer Prize-winning data journalist Steven Rich and supported by a team of dozens of other Post Guild members. We took care to protect the integrity of the data and the privacy of our colleagues.

The result of those efforts is this new report — the most comprehensive study to date of pay at The Washington Post.

This is what we found.

IN THE NEWSROOM

- **Women as a group are paid less than men.**
- **Collectively, employees of color are paid less than white men**, even when controlling for age and job description. White women are paid about the median for their age. Women of color in the newsroom receive $30,000 less than white men — a gap of 35 percent when comparing median salaries.
- **The pay disparity between men and women is most pronounced among journalists under the age of 40**: When adjusting for similar age groups, which in most cases is a good stand-in for years in journalism, it becomes clear that the pay disparity between men and women exists almost exclusively among employees under the age of 40.
- **Men receive a higher percentage of merit pay raises than women**, despite accounting for a smaller proportion of the newsroom.
- **The Post tends to give merit raises based on performance evaluation scores, but those who score the highest are overwhelmingly white.** The Post is fairly consistent across races/ethnicities and genders at awarding raises to those who do well on performance evaluations. But in 85 percent of instances in which a 4 or higher was awarded to a salaried newsroom employee, that employee was white. Employees are rated on a scale of 1 to 5. On the flip side, 37 percent of scores below 3 were given to employees of color in the newsroom (the newsroom is about 24 percent nonwhite).
- **Pay disparities have narrowed from the Graham era to the Bezos era,** but most have not shrunk to within what could be considered parity.

IN THE COMMERCIAL DIVISION

- **Men and women are paid about the same.** Gender pay disparities are nearly nonexistent among salaried employees in the commercial division's nine departments.
- **Pay disparities do exist, however, when analyzing for race or ethnicity.** The median salary for white employees in commercial is $88,000, compared with $83,445 for people of color — a difference of $4,555, or 5 percent.
- **The disparity is even larger when adjusted for age,** suggesting that employees of color in commercial are paid less than their white peers despite having more experience.

The Guild recognizes that these are complicated problems and reflect deeply entrenched disparities in our society. But we believe the company can and must make a significant and urgent effort to address them.

The results of the study were shared with the company ahead of publication. Members of the Guild also met with representatives of Post management to review the findings and invited management to respond. The company declined to comment. If The Post disagrees with any of the Guild's conclusions, we welcome the company to conduct and share a study of its own.

We must note that the ability to analyze pay disparities at The Post has been hindered by the company's lack of specific data on the professional experience of its employees, who sometimes have built lengthy careers before joining The Post. The relative lack of diversity at The Post, particularly the relatively low numbers of black and Hispanic or Latino newsroom employees, also complicated our analysis because of the small sample sizes — but in itself demonstrates that the company must do better to recruit and retain a diverse staff.

We know there are common-sense steps the company can take to eliminate these disparities, and we have outlined a list of those recommendations at the end of this report.

We believe in The Washington Post's ability to do better. We want to help our company get there. This is our guide to making it happen.

PAY ANALYSIS

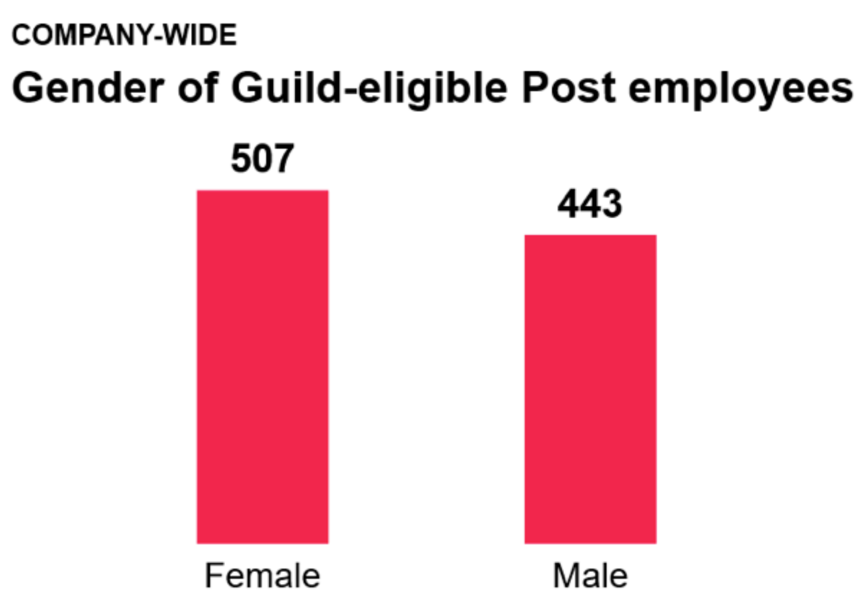
THE POST'S FULL WORKFORCE

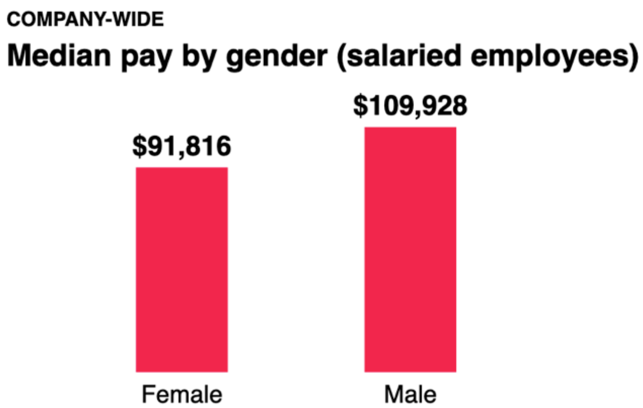
Among all current Guild-covered employees, about two-thirds (707 in total) are salaried. Among those employees, the mean salary is $112,383, while the median salary is $99,904. The median salary is generally a better metric for salaries. The higher mean suggests that the highest salaries have skewed the average upward.

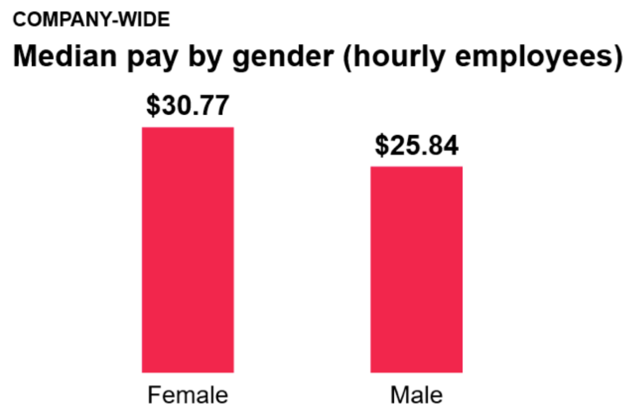
The other third of employees (243 in total) are hourly. The median hourly rate for those employees is $29.23 an hour. While this studFy will largely focus on salaried employees, some sections will analyze hourly employees. The data does not have a field for hours worked per week or average hours worked per week, so take-home pay is difficult to discern — a major difficulty encountered in this study.

Conducting a pay study of an organization like The Washington Post is not easy. Because the organization isn't flat, meaning not everyone with the same amount of experience is working the same job, topline numbers such as median salary by gender or race and ethnicity cannot capture the entire story of pay at The Post. Those figures presented here should be understood primarily as a starting point for discussion. Ultimately, the goal in this report is to add nuance to this analysis, and demonstrate truer metrics for pay at The Post, accurately capturing the landscape to determine where the organization has genuine pay parity, and where it has disparities.

Of all current employees, 53.4 percent are female and 46.6 percent are male. Among salaried employees, 52.3 percent are female and 47.7 percent are male. The median salary for the 337 salaried male employees at The Post is about 20 percent higher than the median salary for the 370 salaried female employees: $109,928 compared with $91,816. One potential reason for some of the $18,000 disparity is the median age of each gender. For men, the median age is 41, while the median age of women is 35.



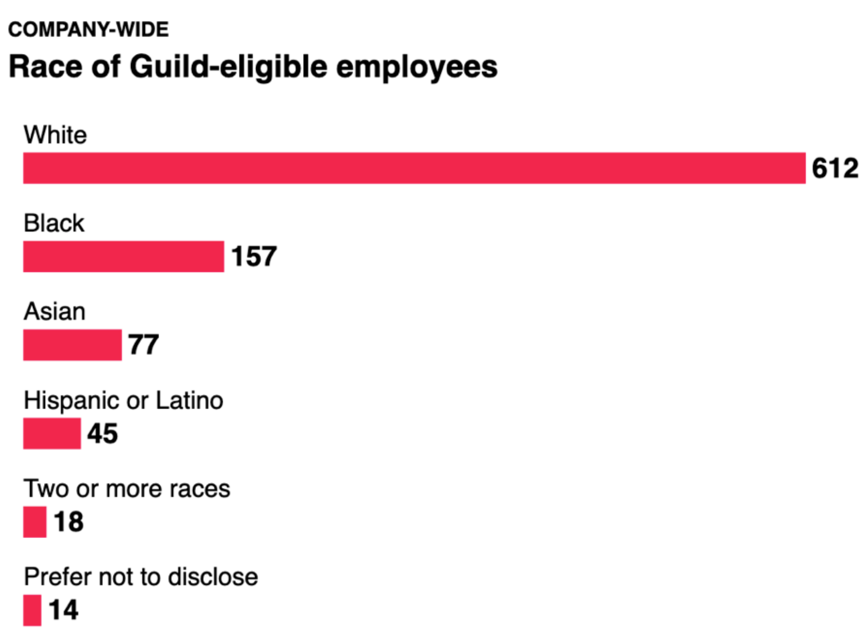




To study employees by race and ethnicity, the Guild again relied on information provided by management, which means the provenance of the data was unclear. The information on race and ethnicity was combined into just one field, which prevented the Guild from separating the two for analysis. Not every employee has a race or ethnicity listed, but the vast majority do. Only 22 current employees, just over 2 percent, do not have this information listed in the database.

Of 950 current employees, the racial and ethnic breakdown is as follows:
• White employees: 64.4 percent
• Black employees: 16.5 percent
• Asian employees: 8.1 percent
• Hispanic or Latino employees: 4.7 percent
• Employees with two or more races: 1.9 percent

For the 707 salaried employees, the racial and ethnic breakdown is as follows:
• White employees: 71.4 percent
• Black employees: 8.8 percent
• Asian employees: 8.3 percent
• Hispanic or Latino employees: 4.7 percent
• Employees with two or more races: 2 percent



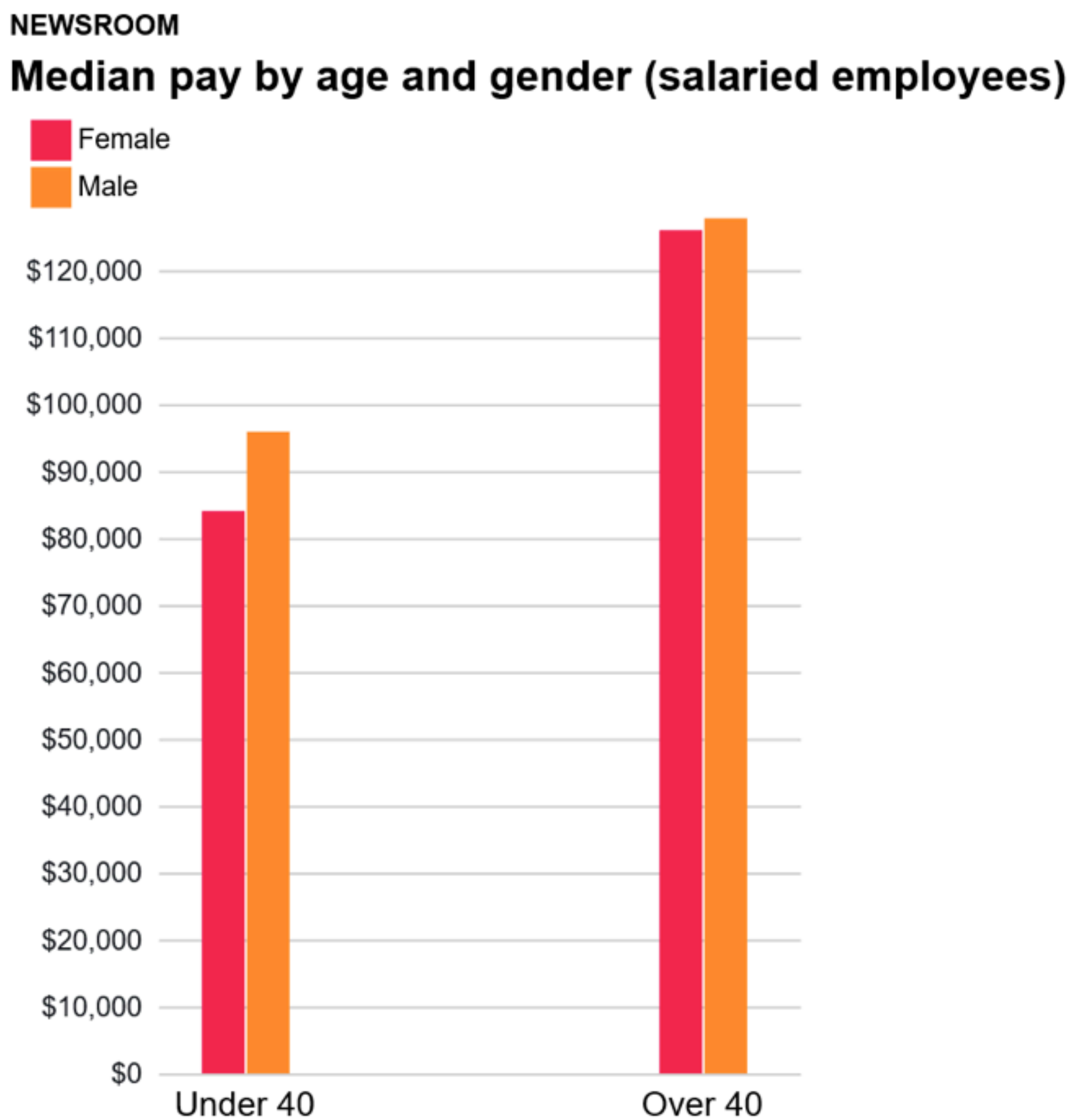
The median salary by race and ethnicity for those salaried employees is as follows:

- White employees: $102,880
- Black employees: $91,881
- Asian employees: $90,780
- Hispanic or Latino employees: $82,000
- Employees with two or more races: $79,860

NEWSROOM

For the 290 salaried male newsroom employees working at The Post, the median salary is $116,065. For the 284 salaried female newsroom employees, it is $95,595. These groups have disparities in age and years of service: The median age for men working in the newsroom is 41, compared with 35 for women.

When adjusting for similar age groups, which in most cases is the best stand-in for years of experience in journalism included in the data, it becomes clear that the pay disparity between men and women exists almost exclusively among employees under the age of 40. For men and women 40 and over, the median salaries are separated by less than 1.5 percent: $127,765 compared to $126,000, respectively.



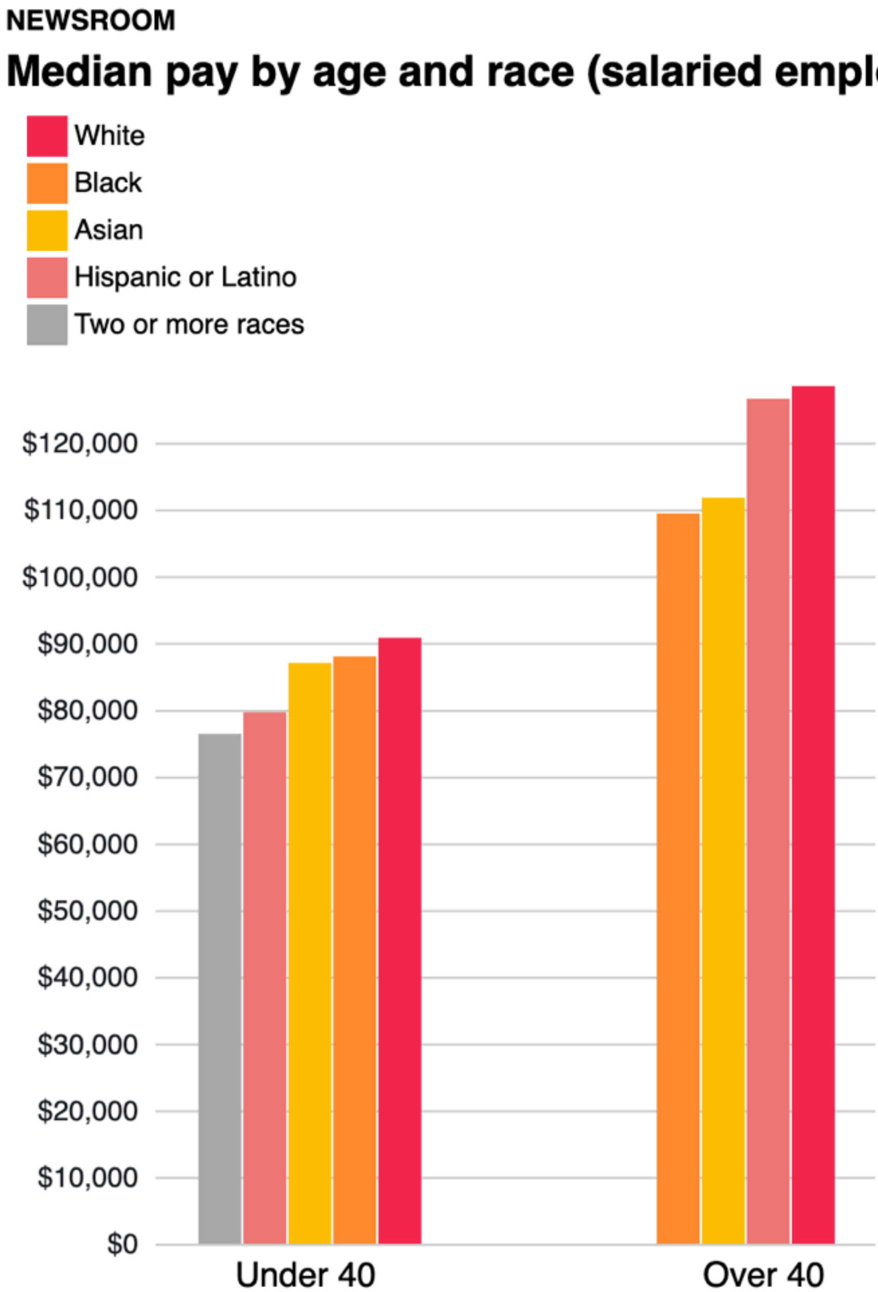
For men and women under the age of 40, the gap is more than 14 percent, with the median salary for men at $95,890, compared to $84,030 for women. It's unclear why this topline disparity exists only for this age bracket. One possible explanation is a hiring disparity in positions that The Post considers more prestigious, and therefore higher-paying. Another explanation might be the pay disparities across races and ethnicities: The younger women at the organization are more diverse.

For 96 hourly employees across the newsroom, there is virtual pay equity. The median hourly wage for men is $33.33, compared with $32.75 for women. Comparing by age is difficult because only 33 men work hourly jobs in the newsroom and their ages vary widely. That said, there is virtual pay parity between male and female hourly workers under the age of 40. Women make more money than men working hourly over 40, but the sample size for men is low (15), meaning a few employees can lower or raise the median fairly drastically.

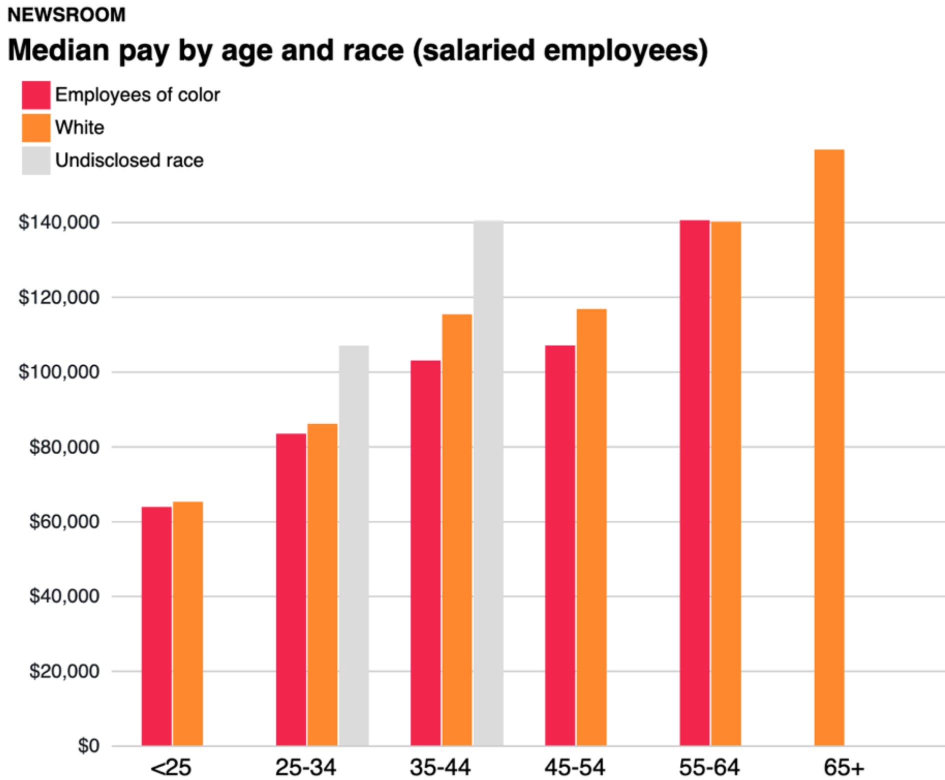
In the newsroom, 71 percent of salaried Guild-eligible employees are white and 24 percent of employees are nonwhite. Below are the median salaries by race and ethnicity across the newsroom:
• White: $106,212
• Black: $97,276
• Asian: $95,205
• Hispanic or Latino: $82,890
• Two or more races: $79,860

The total gap between white journalists in the newsroom and journalists of color is more than 15 percent, with a median salary of $106,212 for 406 white journalists and $92,080 for 139 journalists of color. Much like the gender gap, some of this could be explained by age and years of service: White journalists have a median age of 40 and journalists of color have a median age of 36.

But age doesn't explain everything. Young employees of color across the newsroom don't have complete parity with their young white colleagues. Among those under 40, newsroom employees of color make about 7 percent less than white journalists, with median salaries of $84,780 and $90,780, respectively. The disparity widens for journalists 40 and over: Newsroom employees of color have a median salary of $110,845, while their white colleagues have a median salary of $128,484 — a gap of nearly 16 percent.



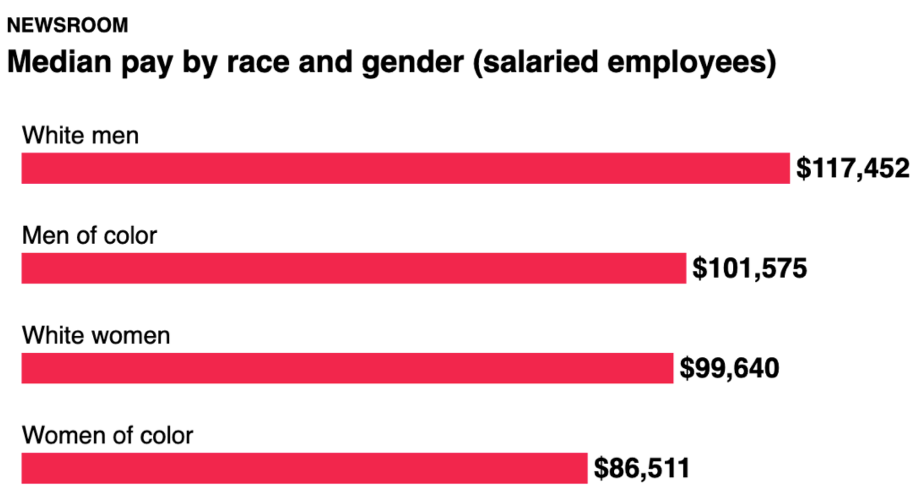
Data is not displayed for six employees who preferred not to disclose their race



About two-thirds of hourly employees in the newsroom are white, making this category more diverse than salaried workers. However, a racial pay gap still exists among hourly employees, with white employees making a median wage of $33.59 an hour, compared to $30.07 for employees of color. That gap of 11.7 percent is well outside the range that the Guild would consider parity in pay. When accounting for age, gaps still exist, though the analysis is difficult because there are only 30 hourly employees of color in the newsroom.

We would be remiss if this study did not examine gender, race and ethnicity through an intersectional lens. Across most industries, disparities increase when multiple factors are taken into account. Our analysis shows a similar pattern. The median salaries by group are as follows:

- White men: $117,452
- Men of color: $101,575
- White women: $99,640
- Women of color: $86,511



The gender pay gap is fairly similar across races and ethnicities. White men make about 18 percent more than white women, and men of color make 17 percent more than women of color across the newsroom. Likewise, racial pay gaps are similar across genders, with white men making about 16 percent more than men of color and white women making 15 percent more than women of color.

When comparing white men in the newsroom to women of color in the newsroom, the gap is over 35 percent, with the median salaries separated by more than $30,000. Here, again, some of this may be attributed to the fact that white men working at The Post have the oldest median age of any group across the newsroom. Median ages by group are as follows:
• White men: 41
• Men of color: 40
• White women: 37
• Women of color: 33

Controlling for age does, in fact, close the gap significantly between white men and men of color and also between white women and women of color. The gender gaps remain fairly consistent.

The Guild attempted to determine median salary by age group as a way to analyze pay by gender and race and ethnicity, and to determine which groups were paid above and below those benchmarks when age disparities were corrected. Controlling for age, here is how the median salaries for the four groups stack up:
• White men are paid an average of 7.27 percent higher than the median for their age group
• Men of color are paid an average of 1.73 percent lower than the median for their age group
• White women are paid an average of 0.14 percent higher than the median for their age group
• Women of color are paid an average of 3.26 percent lower than the median for their age group

Based on this analysis, The Post underpays men and women of color relative to white men. It pays white women about the median for their age.

One unexplored detail in this analysis is how desks factor into the equation: Do disparities exist within desks, and if they do, to what degree? For this, the Guild grouped cost centers into desks where appropriate. But many desks are not captured in the analysis because they are too small to evaluate.

In general, we found the same pattern of disparities throughout the newsroom, but also discovered that desks with some of the highest median salaries — such as National, Financial and Investigative — also had higher percentages of white men. This suggests that The Post must do more to cultivate women and people of color for those desks that demand the highest levels of skill and experience and therefore command the highest salaries.

Of 14 desks that have at least five men and five women, the median pay for men is at least 5 percent higher on 10 desks. Two have a median pay disparity that favors women by at least 5 percent, and two have approximate pay equity between the genders (within 5 percent). Of 10 desks for which there were at least five white journalists and five journalists of color, seven desks have a median pay disparity favoring white journalists by at least 5 percent. Zero have a median pay disparity favoring journalists of color by at least 5 percent, and three have approximate pay equity between the two (within 5 percent).

There are only three desks that have at least five white men, five white women, five men of color and five women of color: National, Local and Design. All three have racial and gender pay disparities. Of those three desks, all have disparities in median salary of more than 30 percent between white men and women of color.

One prominent factor for these pay disparities is that the higher the median salary is for a desk, the higher its percentage of journalists who are male and the higher percentage of journalists who are white.

For desks in which the median salary is higher than $125,000, 80 percent of journalists are white and 57 percent of journalists are men. Those desks include National, Financial and Investigative. In this group, 47 percent of journalists are white men and 10 percent are women of color. For desks in which the median salary is below $92,000, 68 percent of journalists are white and 40 percent of journalists are men. In this group, 28 percent of journalists are white men and 21 percent are women of color.

In an equitable pay environment, one would expect that 50 percent of people in each group would be above the median salary and that 50 percent would be below. Controlling for age and median desk salary, the following represents how many employees are above the median expected salary:

- White men: 57.6 percent
- White women: 48.9 percent
- Men of color: 41.2 percent
- Women of color: 38.5 percent

The deviation from the median for each of these groups when controlling for age and median desk salary is as follows:

- The median salaried white male employee makes $2,448 a year more than the expected median salary for their age and assignment
- The median salaried white female employee makes $14 a year less than the expected median salary for their age and assignment
- The median salaried male employee of color makes $407 a year less than the expected median salary for their age and assignment
- The median salaried female employee of color makes $1,360 a year less than the expected median salary for their age and assignment

We recognize that these groups aren't monoliths, and so in a normal distribution of pay, the Guild would expect about a third of employees to make within 5 percent of the median for their age and desk, about a third to make more than 5 percent below and about a third to make more than 5 percent above. Those distributions also show disparities among these groups.

- White men: 32.4 percent of employees make more than 5 percent below the expected median salary and 48.1 percent make more than 5 percent above the expected median salary
- White women: 38 percent of employees make more than 5 percent below the expected median salary and 35.3 percent make more than 5 percent above the expected median salary
- Men of color: 41.2 percent of employees make more than 5 percent below the expected median salary and 29.4 percent make more than 5 percent above the expected median salary
- Women of color: 46.2 percent of employees make more than 5 percent below the expected median salary and 25.6 percent make more than 5 percent above the expected median salary

The data also shed light on who received raises over the past five years and their performance evaluation scores for the past four.

For men and women in the newsroom, the median performance evaluation score is even, at 3.4 for 3,664 evaluations conducted over four years. Analyzed by race and ethnicity, scores started to diverge. Among groups for whom more than 20 evaluations were done over the four years from 2015 through 2018, the median performance ratings were as follows:

- White: 3.5
- Asian: 3.4

• Hispanic or Latino: 3.3
• Black: 3.3
• Two or more races: 3.2

For men, performance ratings were always at least equal to those of their female counterparts of the same race or ethnicity. Ratings for men and women by race and ethnicity were as follows:
• White men: 3.5
• White women: 3.4
• Asian men and women: 3.4
• Hispanic or Latino men and women: 3.3
• Black men: 3.3
• Black women: 3.25
• Men and women of two or more races: 3.2

It is unclear what accounts for these disparities in performance evaluation scores.

Most pay raises in the newsroom are a result of Guild-negotiated contracts that award across-the-board increases in salaries. In addition, people also receive merit pay increases, which are based on performance evaluations and awarded solely at the discretion of management. Merit pay increases account for 26 percent of all raises. They are an important way to reward effort and initiative but can also create and magnify disparities if the company does not take steps to ensure fairness in the way performances are evaluated and rewarded.

Men received 51.7 percent of those merit raises, and women received 48.3 percent. (The newsroom's gender makeup is 48.2 percent men and 51.8 percent women.)

The percentages of merit raises distributed by race and ethnicity for salaried journalists are as follows:
• White: 75.7 percent
• Black: 9.3 percent
• Asian: 8.3 percent
• Hispanic or Latino: 3.6 percent
• All others: 3.1 percent

For contrast, over that time the racial and ethnic makeup of salaried employees is as follows:
• White: 70.1 percent
• Black: 9.1 percent
• Asian: 8.5 percent
• Hispanic or Latino: 4.6 percent
• All others: 7.7 percent

The Post contends that merit raises are tied mostly to performance evaluations, and the data bears that out. Those who score higher, regardless of race, ethnicity or gender, tend to be the ones who get merit raises most frequently. However, an analysis of every performance evaluation score over the past four years shows that those who score the highest are overwhelmingly white.

In cases in which a 4 or higher was awarded to a salaried newsroom employee, 85 percent were white, and over half of scores of 4 or higher were awarded to white men. And in cases in which salaried newsroom employees were given a score of 3 or below, 37 percent of those scores were given to employees of color (the newsroom is about 24 percent nonwhite).

GRAHAM FAMILY ERA VS. BEZOS ERA

Finally, the Guild wanted to examine whether pay disparities had changed after Amazon founder Jeff Bezos bought The Washington Post in 2013 from the Graham family. Analysis shows that from the Graham era to the Bezos era, pay disparities have shrunk slightly, but not to within a range that the Guild would recognize as the point of parity. While white men are paid closer to the median salary across age groups, all other groups are also closer to white men than they were before.

Overall, the pay disparity between current white newsroom employees and current newsroom employees of color who were hired under the Graham family is 12 percent. For current employees hired after Bezos acquired the newspaper, that disparity is down to 5 percent. In particular, the gender pay gap has narrowed for new hires. Whereas the disparity between men and women who were hired under the Graham era is 5 percent, that figure is down to 3 percent for current employees hired after Bezos purchased the paper. A big drop occurred between white men and women of color, down from a 16 percent disparity to an eight percent disparity.

For current employees hired under Bezos's ownership, salaries when accounting for age (years in journalism) and median desk pay are as follows:

- White men are paid an average of 9 percent higher than the median for their age group and desk
- White women are paid an average of 6 percent higher than the median for their age group and desk
- Men of color are paid an average of 3 percent higher than the median for their age group and desk
- Women of color are paid an average of 1 percent higher than the median for their age group and desk

COMMERCIAL

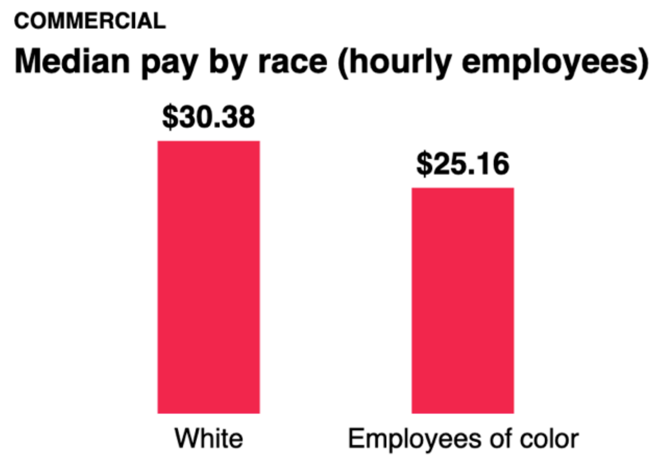
Analysis of the organization's commercial side as a whole is difficult, because it includes nine different departments across the organization and only 133 salaried employees and 147 hourly employees. These numbers are large enough for topline analysis, but with the introduction of more and more factors, the results become less reliable. In many departments, it is difficult to ascertain pay equity or disparity across races/ethnicities and genders because they have too few employees.

The following section attempts to examine pay where possible. As with the newsroom section, topline numbers are only reliable insofar as they reveal broad trends, though they cannot capture other factors that influence pay, such as years of experience or the demands of the job itself.

About one-third of Guild-covered employees work on the commercial side of The Post. Overall, gender pay disparities are nearly nonexistent. For the 47 salaried men working in commercial at The Post, the median salary is $86,880; for the 86 women, it's $85,977.

The difference of 1 percent indicates that the two groups are effectively on par. That equity does not hold when it comes to race and ethnicity, though disparities are smaller on the newsroom side. For the 99 salaried employees on the commercial side who are white, the median salary is $88,000; For the 32 employees of color working alongside them, the median salary is $83,445. That disparity of 5.5 percent is lower than the disparity for commercial's hourly employees.

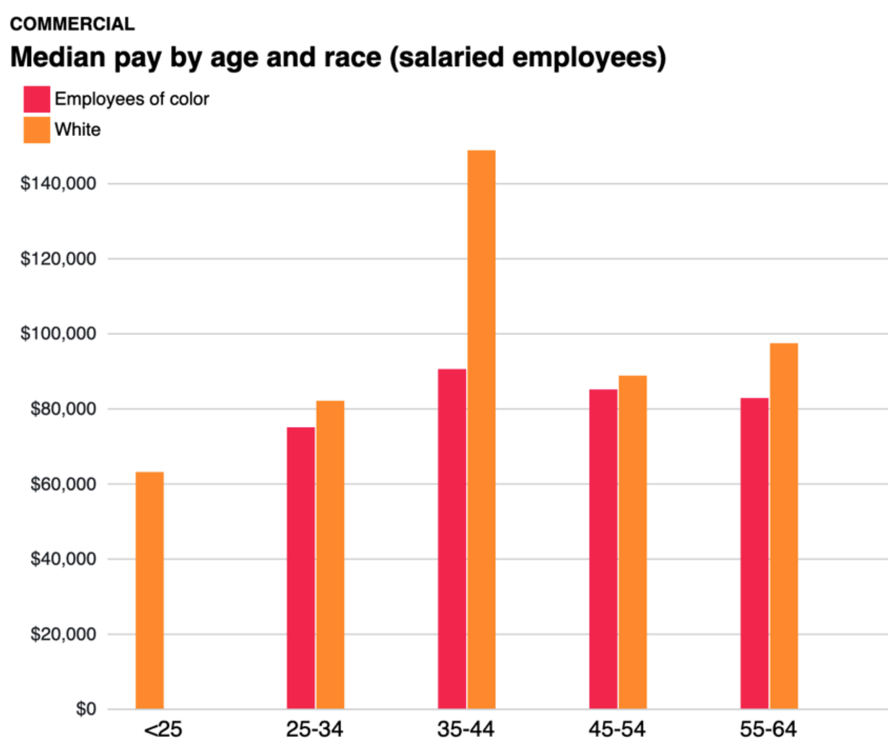
For the 43 hourly employees in commercial who are white, the median hourly rate is $30.38; for the 101 employees of color working alongside them, the median hourly rate is $25.16. That represents a disparity of more than 20 percent.

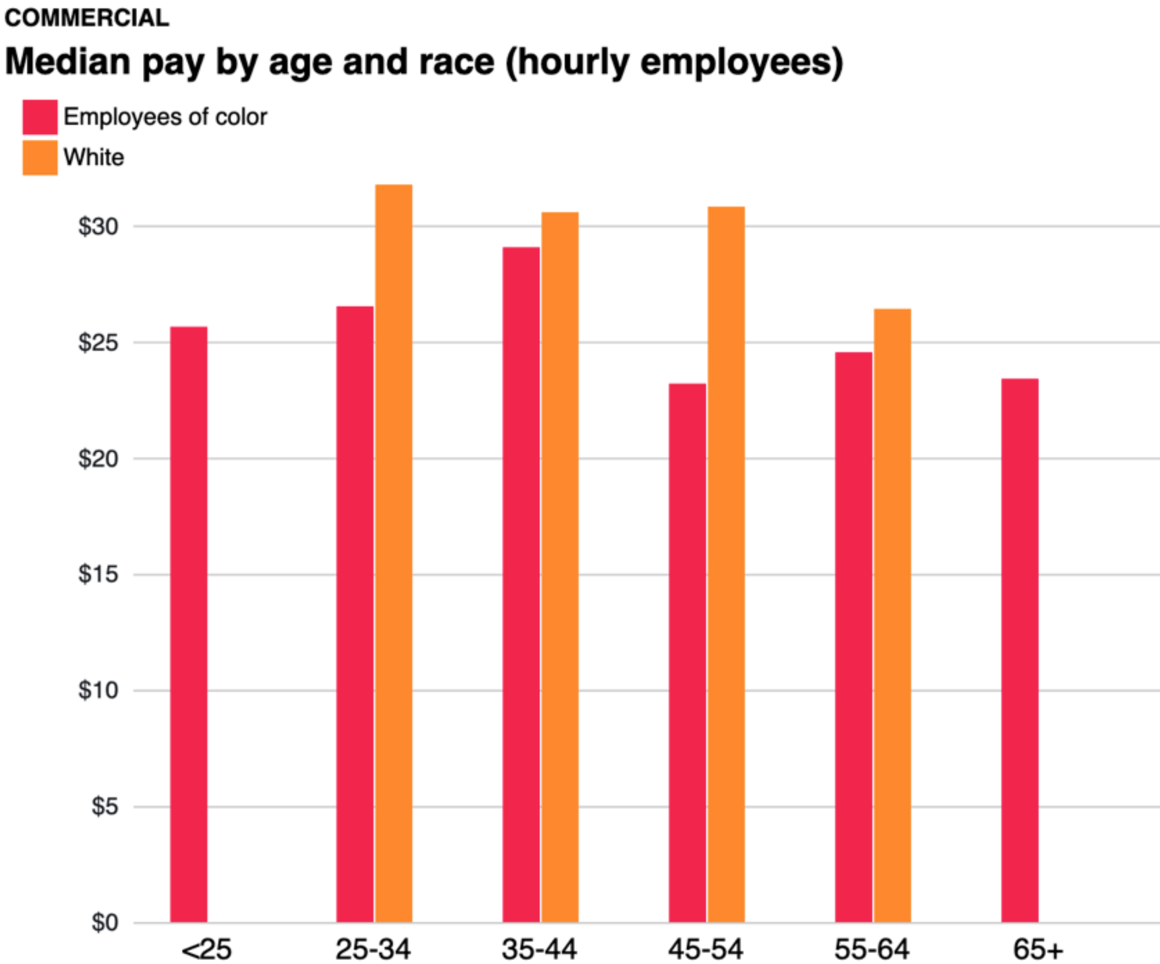


When adjusting for age, the disparity grows even larger. The gap between the median ages of employees of color and white employees overall is five years; the median age for white salaried employees is 35, and for employees of color it is 40. For hourly employees, the median ages are 39 and 47, respectively. So employees of color in commercial tend to be paid less than their white counterparts, despite tending to have more experience in their jobs.

Examining race and ethnicity within genders reveals an interesting pattern. Among women, the racial pay disparity is quite low. The 67 salaried white women in commercial have a median salary that is 1.3 percent higher than that of the 17 women of color. This gap falls within the range that the Guild considers approximate pay parity. The women are clustered around the median salary for all of commercial.

But between white men and men of color, the pay disparity is stark. For the 32 white men, the median salary is $94,497; for the 15 men of color, the median salary is $76,866. That disparity is 22.9 percent, one of the highest disparities seen across the entire organization.





This trend is different for hourly employees. In many workplaces, the biggest pay gap tends to exist between white men and women of color, but in commercial, the biggest gap among hourly employees is the gap between white women and men of color. In fact, the gap between white men and women of color is almost nonexistent. The median hourly rate for the 21 white men in commercial is $26.76, compared with $26.54 for the 52 women of color — a difference of just 0.8 percent. On the other hand, the median hourly rate for 22 white women is $31.76 and for the 49 men of color is $23.33, a 36.1 percent disparity.

One of the issues with attempting to determine disparities across commercial is that the data does not allow us to determine how many hours an employee works. The data distinguishes between full- and part-time hourly employees but does not count how many hours part-time employees work (which would be difficult, because of the fluidity of many part-time schedules).

When analyzing just the full-time hourly employees in commercial, the disparities shrink and shift. For the men and women of color, the wages are virtually the same for full-time employees on an hourly wage. For white men and women, hourly wages are about $2 apart. But while full-time men and women of color have median hourly rates of $26.04 and $26.82, respectively, full-time white men and women have median hourly rates of $29.91 and $31.84, respectively.

There is a slight gender disparity in the scores that commercial employees have received on performance evaluations. While the median score for women is 3.3, the median score for men is 3.2. Similarly, when it comes to race and ethnicity, while white and Asian employees in commercial each have a median score of 3.3, black employees have a median score of 3.2 and Hispanic or Latino employees each have a median score of 3.15.

Finally, an analysis of raises for The Post's commercial employees shows few disparities in who receives them. The most common type of raise among commercial employees, with the exception of those mandated by Guild contracts, is merit raises.

Men received 44.3 percent of those merit raises, and women received 55.7 percent. (The gender makeup of commercial is 42.9 percent male and 57.1 percent female.)

The percentages of merit raises distributed by race and ethnicity for salaried commercial employees were as follows:
• Black: 47.4 percent
• White: 40.7 percent
• Asian: 7.1 percent
• Hispanic or Latino: 3.5 percent
• All others: 1.3 percent

For contrast, over that time the racial and ethnic makeup of salaried employees was as follows:
• Black: 37.5 percent
• White: 47.8 percent
• Asian: 7.3 percent
• Hispanic or Latino: 4.2 percent
• All others: 3.1 percent

Merit raises went to these groups in the following percentages, compared to the percentages they make up in commercial:
• White men: 17.1 percent of merit raises vs. 18 percent of employees
• White women: 23.6 percent of merit raises vs. 29.8 percent of employees
• Men of color: 27.1 percent of merit raises vs. 24.9 percent of employees
• Women of color: 31.9 percent of merit raises vs. 27.3 percent of employees

ADDITIONAL ANALYSIS

The analysis provided above is a fraction of the analysis completed as part of this pay study. If we had written it all up, this report would be much, much longer. The numbers in this report represent the most relevant topline numbers in the analysis, and all attempts were made to present those numbers alongside context including factors such as age and job.

If you are interested in seeing the Post Guild's full analysis, it is attached as an appendix to this report.

TESTIMONIES

In interviews, employees across desks and departments described troubling pay disparities between colleagues doing the same job, even with the same level of experience. They expressed frustration with a system that encourages employees to seek offers elsewhere in order to receive significant raises. They spoke of a hiring process that benefits industry insiders coming from higher-paying competitors and that too often sets back women, people of color, and journalists from smaller publications.

The employees that the Post Guild interviewed come from a variety of departments in the newsroom, including Video, Photo, Local, Foreign, Style and Graphics, as well as from commercial. All asked for their names and certain identifying details to be withheld.

Veteran employees hired as interns or entry-level staff members described being pigeonholed into jobs with slow, incremental raises and limited opportunities for substantial salary boosts. One news reporter hired as an intern nearly 20 years ago said he still makes less than $70,000 a year. He's thinking about getting a part-time job, he said, possibly driving for Uber.

"This is not to disparage anybody … but it's tough to sit there and look at someone who's 15 years younger than you, with 10, 15, 20 years less experience, making significantly more than you," he said. "It feels like a caste system."

One veteran reporter said it took her more than two decades at The Post to feel that she had any substantial disposable income. At one point, while working as a foreign bureau chief, she learned that the man who previously held her job, a reporter of the same age with more managerial experience but a fraction of her experience at The Post, was making $50,000 more than her.

Another female employee, a 35-year-old award-winning journalist who started as an intern in the mid-2000s, recently found out that all of the men on her team are paid more than her — even though she's been at The Post longer than all of them and has been working in journalism longer than most of them. One of the men on her team is paid more than $30,000 more than her.

While she has received incremental raises, The Post only gave her a substantial raise after a competitor offered her a job several years ago.

"It's always disgusted me that the only way we can get what we deserve is by getting an offer somewhere else," she said. "How is that a way to show that you value someone?"

She has noticed a pattern of young women like her being hired at low salaries and getting "stuck."

"We don't know what we should be paid, because no one tells you that in college," she said. "You take what you're offered, and then you're on this track."

One 32-year-old female newsroom employee was hired about a year and a half ago after two years in journalism and about a decade of other related job experience. The Post job application asked her how much she made in her previous job, as a fellow at a nonprofit journalism outlet, and how much she would like to make in her new job.

Not long after she joined The Post, she found out that a colleague who started on the exact same day, in the same position, with a similar level of experience, was hired at a salary $14,000 higher than hers. That colleague told her that before she was hired, she had known another member of the team who encouraged her to negotiate for a higher salary. The 32-year-old employee, meanwhile, did not know that she could negotiate upward of 20 percent of her salary upfront.

She said she then went through the salary review process, which concluded that she was, compared to her colleagues and other market rates, underpaid by at least $10,000. But neither that information nor the process that furnished it guaranteed corrective measures of any kind.

In her annual review this year, she did get a sizable merit raise, which cut her pay disparity with her colleague in half. Still, she said, “it’s this continual uphill battle of just trying to get even.”

“That money should really not be used for corrective purposes,” she said of the merit raises. “It’s very hard, once you start at a lower point, to ever fully play catch-up. “Because as I’m playing catch-up, people are getting actual merit increases. There’s no — as far as I can see — clearly defined process or path for correcting these pay inequities.”

One 29-year-old female employee started at The Post more than five years ago in an entry-level job at a low salary. The role was a demotion from her former job but was described to her as a starting point with opportunity for advancement. She was quickly promoted to editing roles with demanding evening and weekend hours. While she has received raises almost every year, she recently learned that at least three colleagues on her team, at her same level, make tens of thousands of dollars more than her.

“It made me feel undervalued and made me question what I’m doing and if this is really a sustainable place to be,” she said. “Can I actually buy a house here? I don’t want to just live this kind of life forever.”

She wants to ask how she can bump up her salary, but she isn’t sure how or when to have that conversation with her supervisor.

“I’ve definitely noticed morale sinking for me,” she said.

On the commercial side, one employee in Client Solutions described a lack of opportunities for upward mobility, especially for people of color. The employee, a 40-year-old woman of color who has worked in Client Solutions for more than five years, said she has been trained to manage new departmental tasks outside of her role. But when she has expressed interest in applying for available positions, she has not been considered. Instead, she has taken on new responsibilities without a pay increase.

She would ideally like to transition to a role that is more in line with her new skills and training, but she has seen the department focus its hiring on young people fresh out of college. At her age, she said, “I’ve already accepted that that’s not an opportunity for me.”

The Post Guild also found pay disparities among newsroom aides, whose salary floors are much lower than those of other employees. One newsroom aide, a full-time staffer, was hired at a salary of less than $40,000 a year. As a recent college graduate, the aide did not negotiate for a higher salary.

“I think I was scared of them rescinding my job offer,” the aide said. “I feel so stupid for not doing it … It makes me so upset to even think about it. But I didn’t even think to negotiate or ask for more money.”

The employee has since found out that another aide, who is the same age, has a similar level of experience and was hired around the same time, makes $4,000 more. Another slightly more senior aide makes about $12,000 more.

The aide thought back to orientation day at The Post, when new employees were told they had been hired for long careers at the company. With such a low salary and an unclear path for moving up, the employee wondered how likely such a career at The Post might be.

“It just feels very almost disingenuous,” the employee said.

RECOMMENDATIONS

The Guild believes that a diverse, equitable and inclusive workplace is key to The Post's success as an organization. While the company has made progress, there is still work to do. To help promote such an environment, the Guild offers the following recommendations:

The Post should strengthen and better formalize the salary review process. This process — which the Guild negotiated for in its last contract — is intended as a mechanism to empower employees to understand how much they are being paid in relation to their co-workers, ideally providing the groundwork for salary negotiation conversations with their direct managers. Currently, only one Post employee conducts salary reviews for the entire company. We believe this is too much work for just one person, and we recommend that more Post employees be trained on the salary review process to ensure reviews are completed in a reasonable time frame. Furthermore, it should be made clear in new employee onboarding and orientation that employees may request a salary review at any time. We also recommend that the organization conduct salary reviews for all employees hired in the past five years. Employees who go through the salary review process should also have the option of having a Guild representative present during the process if they wish. We believe these enhancements to the salary review process can be accomplished in a reasonable time frame and would signal that the company values empowering its employees to have these conversations.

The Post should allow direct managers to know how much their reports make. Currently, many direct managers do not know this information, despite being in the best position to negotiate raises on their reports' behalf. Also, these managers are often responsible for having salary conversations with new hires and should be appropriately informed about pay expectations. This would empower direct managers to look out for and be aware of pay disparities on their teams and help correct them, taking some of that burden off top management.

The Post should ensure that pay disparities do not begin during the hiring process. The Post currently requires prospective applicants to list their salary history and desired salary during the application process. We believe the company should remove these questions — that of previous salary history and desired salary — entirely from the application and interview process. These questions often serve to perpetuate gender pay gaps, and have already been banned from states such as California and cities such as New York. The company should not use these questions as a proxy to determine applicants' starting salaries. As one of the largest and best-resourced newsrooms in the nation, The Post clearly has enough information to determine what the expected salary for a Post-caliber position should be.

The Post also should re-evaluate the existing two-year intern program. For many years, The Post would hire summer interns into full-time positions but classify them as "two-year interns." Two-year interns are essentially full-time Guild-covered employees with benefits but are slotted into a salary of less than $50,000 for two years. Once they "graduate" from the two-year program, these employees are at a disadvantage with regard to pay in comparison to their peers, despite often having the same amount of experience. The Post has moved away from this model in recent years, instead hiring some interns as contractors and some as full-time staffers. Many contractors eventually transition to full-time staff, but the two-year intern classification has not been eradicated. While we applaud The Post for hiring interns and giving young people opportunities, we believe this classification, if no longer being used, should be retired entirely.

The Post must do more to ensure that the company reflects the diversity of American society. The

Post must do more to recruit and retain employees from underrepresented backgrounds, especially black and Hispanic or Latino journalists. We recommend that The Post create a new job position for a recruiter to scout talent from underrepresented backgrounds. The Post should be present and actively recruiting at journalism conferences, such as those held by the National Association of Black Journalists, the Asian American Journalists Association, the National Association of Hispanic Journalists and the Native American Journalists Association. We are inspired by the recent news that Vox Media has committed to ensuring that 40 percent of applicants who pass a phone interview round must be from underrepresented backgrounds — a stipulation negotiated by the Vox Media Union. We recommend The Post adopt a similar approach and support having diverse candidate pools for positions, as an investment in our belief that diverse, representative institutions — especially in the journalism industry — better serve their communities.

To hold the company accountable in creating an equitable and diverse workplace, we also recommend that The Post hire an equity, diversity and inclusion chair/consultant and form a diversity committee. This consultant should be hired by the end of 2020. The committee should be created as soon as possible. This consultant can help the company establish goal posts for creating a more diverse workplace, draft initiatives to support these endeavors and also act as an accountability arm. The diversity committee would work closely with this consultant, but would also create and enact initiatives that support increased equity, diversity, and inclusion throughout The Post. One such project could be creating guidelines for inclusive journalism, similar to a guide published by the Seattle Times diversity committee. This committee should be made of a mix of employees from all parts of the organization. nization.

PAY HISTORY AT THE POST

The fight for equal pay at The Washington Post has spanned decades of hard work, collective action and uncommon courage from past generations of Post employees.

When the Civil Rights Act of 1964 passed the Senate after the longest debate in its history, Title VII came into law, prohibiting employment discimination based on race, sex, color, religion and national origin. The act not only prohibited discriminatory pay, but also discrimination in recruitment, hiring, assignment, promotions, benefits, discipline and layoffs.

It also created the Equal Employment Opportunity Commission, a committee tasked with eliminating employment discrimination. It was not until 1972, however, that the EEOC gained enforcement powers, unleashing a decade of legal fights for equal employment and pay, including at The Post.

In 1972, 117 female employees of The Post joined the Washington-Baltimore Newspaper Guild to file a sex discrimination suit against The Post with the EEOC. Women at The Post had seen little improvement in their pay and working conditions since signing a memorandum of understanding with management two years earlier, in 1970. The suit was finally settled in 1980 with $50 to $250 in back pay distributed to 567 women and the company's agreement to a five-year affirmative action plan that guaranteed one-third of editorial and commercial jobs would be filled by women.

The settlement did not require the company to admit sex discrimination or a violation of Title VII — though the EEOC in 1974 had found "reasonable cause to believe" that The Post discriminated against women in salaries, promotions, and aspects of hiring.

Not everyone was thrilled with this settlement. "If this is a victory, I'd hate to see a defeat," one female assistant managing editor told a Post reporter in 1980.

In the same year as the 1972 sex discrimination suit, black Post employees were also organizing. Nine black reporters delivered a list of 20 pointed questions to editor Ben Bradlee about the lack of black editors and reporters, particularly on prestigious desks, and the nature of their assignments. In her memoir, Dorothy Butler Gilliam relates how one of the petitioners, LaBarbara "Bobbi" Bowman, described meetings with the editor: "His hands were shaking, and I thought, 'We have scared Ben Bradlee.'"

Seven of the original group went on to file a complaint with the EEOC about discriminatory hiring and promotion of black reporters in a city that was then over 70 percent black. They were all junior reporters, and would come to be known as the Metro Seven. The EEOC found that the group had grounds to go to court — but they lacked the resources to do so, and so never filed a lawsuit.

Despite this, Gilliam writes, the Metro Seven's work "did cause movement inside The Washington Post newsroom. Managers broadened subject beats, increased the number of columnists of color, and stepped up promotion and hiring" of black employees.

"The progress in hiring Blacks in daily newspapers," Gilliam writes, "was not simply due to the largesse of white editors."

Katharine Graham herself noted in her autobiography, "Personal History," that "without the suits and without the laws adopted by the country," The Post would not have seen the significant improvements it did to the numbers and working conditions of women and people of color at The Post in the 1970s.

But the story did not end there.

In the 1980s, The Post still had a pay gap problem, and the lawsuits kept coming. A new "dual" pay system instituted by management in the 1979 contract led to widening pay gaps, lower minimum salaries, and more managerial discretion in the setting of salaries and merit increases, particularly in the newsroom.

Post management argued that experience and years spent at The Post could account for pay disparity — a position it maintained as recently as 2016 — but a 1986 pay study by the Guild showed that "in the newsroom, where management has the most flexibility in setting pay, long service at the Post and experience count less for women and blacks than for white males, who often command higher salaries even with less experience and fewer years' service." Among reporters in 1986, the average salary for white men was $988.68 per week. For black women, it was $791.33.

One year later in 1987, Gwen Ifill wrote in a Post Guild bulletin that "The patterns for pay discrimination that have contributed over the years to low morale and wide gaps in the amount Washington Post managers are willing to pay their employees not only persist, but have widened significantly" for women and black people since 1986. White men were then earning $240.59 a week more than black women, a gap that had widened by $43.24 from the year before. "We can't eat prestige," Ifill wrote.

In the years since Ifill's bulletin, pay disparities have contracted and expanded, but never closed completely. In 1988, the Guild filed a charge of discrimination with the D.C. Office of Human Rights and the EEOC. The suit was settled in 1997 with an agreement to provide final and binding arbitration by employees asserting a claim of discrimation. Eighteen such claims were filed, with the last one settled in 2003.

The Guild conducted a pay study at The Post in 2016 that revealed significant disparities, although Post management dismissed the results and declined the Guild's invitation to address the issue collaboratively. However, the Guild's persistence in 2017-2018 contract negotiations resulted in a new contract section: Article XVIII(c), which empowered employees to initiate individual pay equity reviews conducted by the Human Resources department.

The advancements made by previous generations of Post employees, empowered by civil rights legislation and by the Guild, are a testament to the power of collective action and the bravery of those who put their jobs on the line in the name of equality. As the latest pay study will attest, there is still much work to be done.

PAY STUDIES AT OTHER COMPANIES

The Post Guild, of course, is not the only entity to conduct a pay study. Google and Citigroup are two major companies that have recently conducted public pay equity studies.

In March 2019, Google released a summary of its 2018 pay analysis only for groups consisting of 30 employees or more, containing five or more people per demographic (i.e. women, men, minority, non-minority) to ensure statistical accuracy. Google says the purpose was to “identify any unexplained differences between groups of Googlers who are doing the same job.” Google found in one particular job code, men received less discretionary funds than women, but did not elaborate on any other job code discrepancies. Google spent $9.7 million on pay gap adjustments across 10,677 employees, 49 percent of which was spent correcting hire offers. The company was critiqued for examining only if demographic groups were being paid equally for the same job, rather than addressing which jobs and pay groups certain demographic groups are placed into.

The Citigroup study, released January 2018, differentiated between “adjusted” pay gaps, which account for “job function, level and geography,” and unadjusted, or raw, pay gaps. The adjusted analysis found negligible disparities between women and men, and between minorities and non-minorities. But the raw data showed that the median pay for women globally was 71 percent of the median for men, and that the median pay for U.S. minorities was 93 percent of the median for non-minorities. Citigroup resolved to increase representation of women and minorities in managerial levels.

A number of media unions have also conducted their own pay studies of their newsrooms, such as Bloomberg. Published in January 2019, the study found that Bloomberg BNA has a newer workforce (more than half of the bargaining unit employees having less than five years at the company) and is above average in terms of gender diversity compared to the news industry. Still, the study concluded that significant pay disparities exist. The median salary for black employees is on average $7,800 less than their white counterparts. For Hispanic employees, on average $10,609 less than their white counterparts. Pay disparities appeared to be widening for newly hired women into the commercial and IT departments. Across the board, women make less than their male counterparts and employees of color make less than their white counterparts. It’s also worth noting that white employees were found to be overrepresented in the newsroom.

While Bloomberg has made an effort to bring in new hires, the merit pay system already in place meant the pay disparities inevitably continued, and the company does not have a mechanism to balance pay. The study recommended a proactive pay policy for new hires and compensation for current employees. BBNA’s guild chair noted that she found the methodology flawed because it is difficult to quantify experience. She also noted that disparities varied across groups in the company, and that that should be kept in mind as solutions are proposed.

METHODOLOGY

The Washington Post Newspaper Guild received pay data from Post management on July 2, 2019, after Alice Li and Sophie Ho, co-chairs of the Guild Diversity and Equity Committee, made a request pursuant to the Guild's contract with The Post. On that date, data was transmitted to the Washington-Baltimore News Guild via a thumb drive, which was transferred to Steven Rich. Data was transferred to an air-gapped machine — one that wasn't connected to the Internet — and the thumb drive was returned to the News Guild. Rich was the only member of the Post Guild granted access to the data, and data was promptly destroyed upon completion of the analysis to prevent the full data set from becoming public.

The data comprised two Microsoft Excel spreadsheets with three tabs each: one spreadsheet for The Post's current Guild-covered employees and one spreadsheet for terminated employees, as of July 2. This only includes employees who were covered by the union's collective bargaining agreement with The Post, regardless of whether they are dues-paying members of the Guild, and is not a complete survey of salaries across the organization; it is unclear how many Post employees, such as managers, are excluded. The data lists 950 current employees and 539 terminated employees. Here, "terminated" means terminated from the Guild, which in most cases means that the employee left The Post, but can also mean that the employee was promoted to a position ineligible for Guild membership.

The first tab of the data contains 167 fields of information about each current employee and 128 for employees who left or are no longer covered by the Guild. (Only one field in the latter doesn't appear in the former: date of termination.) This provides a fairly comprehensive look at employees at The Post, excluding one field that the Guild is not entitled to: full legal name of the employee. It would be feasible to determine some names using the available information, but the Guild made no attempt to identify anyone in the data and, over the course of its analysis, never perused the records of individual employees.

Identifying the median salaries of small numbers of people would make it easy to discern individuals' salaries, so the Guild took two preventive measures, while also aiming to accumulate as many accurate results as possible. The first involved grouping employees by factors such as age, race and newsroom desk. The Guild created these groups in consultation with experts who study pay trends as well as Guild members familiar with the newsroom's structure. Second, we suppressed results from any group or subgroup that had fewer than five people, because results for small groups can be misleading. For example, in a group of three people, the person who makes the second-largest or second-smallest amount of money has the median salary. Additionally, all three members would know exactly who they are in the analysis, an outcome that seemed preferable to avoid.

To study salaries by gender, the Guild relied on a field provided by The Post. The field is binary, containing no additional information beyond "male" or "female." It is unclear how The Post determined this information for its employees. That caveat aside, the field had information for every employee in the data set.

Analysis in Python was written by Steven Rich and audited by Aaron Williams. Analysis in r was written by Steven Rich and audited by Andrew Ba Tran.

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APPENDIX

We want this study to be transparent and accessible, so we have decided to publish the results in full in this appendix section.

It contains breakdowns by job title, desk and more, but suppresses results that are less than five people to ensure more accurate results and to protect the identities of our colleagues.

This code was written by data editor Steven Rich – in two languages, Python and R. It is our hope that other news organizations within our NewsGuild family, and those fighting to unionize right now, can use our pay study as a model for how to bring transparency to their own workplaces.

Appendix A: Analysis in Python

November 6, 2019

1 Washington Post Newspaper Guild Pay Study 2019

This is the study of Washington Post Guild members' salaries based on data turned over by management of The Washington Post on July 2, 2019, pursuant to a request by members of the Guild. Management turned over two Excel files: one file detailing the salaries of current guild members working for The Post (as of the date of transmission) and one file detailing the salaries of past guild members who worked for The Post and have left the organization in the past five years.

What follows is an attempt to understand pay at The Washington Post. No individual analysis should be taken on its own to mean that disparities in pay do or do not exist. This study will start with summary analysis of trends and will dive deeper as the study goes on.

The only data manipulation done prior to analysis was taking the data out of Excel and putting the files into CSV files, converting dates from 'MM/DD/YYYY' to 'YYYY-MM-DD' and removing commas from monetary columns where values exceeded 1,000.

1.1 Importing data

[1]:
```
from pathlib import Path

import re
import numpy as np
import pandas as pd
import statsmodels.api as sm
from statsmodels.iolib.summary2 import summary_col
from linearmodels.iv import IV2SLS
import seaborn as sns

pd.options.display.max_columns = None

pd.set_option('display.float_format', lambda x: '%.2f' % x)
```

[2]:
```
BASEDIR = Path.cwd()
CSVPATH = BASEDIR.joinpath('csvs')
```

[3]:
```
active_wd_schema = {
    'department': str,
    'employee_id': str,
    'gender': str,
```

```python
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    '2016_annual_performance_rating': np.float64,
    '2017_annual_performance_rating': np.float64,
    '2018_annual_performance_rating': np.float64
}

parse_dates = ['date_of_birth', 'original_hire_date',␣
 ↪'hire_date','effective_date1','effective_date2','effective_date3','effective_date4','effect
```

[4]:

```
terminated_wd_schema = {
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    'employee_id': str,
    'gender': str,
    'race_ethnicity': str,
    'date_of_birth': str,
    'original_hire_date': str,
    'hire_date': str,
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    'business_process_type1': str,
    'business_process_reason1': str,
    'pay_rate_type1': str,
    'base_pay_change1': np.float64,
```

```
    'job_profile1': str,
    'time_type1': str,
    'cost_center1': str,
    'effective_date2': str,
    'business_process_type2': str,
    'business_process_reason2': str,
    'pay_rate_type2': str,
    'base_pay_change2': np.float64,
    'job_profile2': str,
    'time_type2': str,
    'cost_center2': str,
    'effective_date3': str,
    'business_process_type3': str,
    'business_process_reason3': str,
    'pay_rate_type3': str,
    'base_pay_change3': np.float64,
    'job_profile3': str,
    'time_type3': str,
    'cost_center3': str,
    'effective_date4': str,
    'business_process_type4': str,
    'business_process_reason4': str,
    'pay_rate_type4': str,
    'base_pay_change4': np.float64,
    'job_profile4': str,
    'time_type4': str,
    'cost_center4': str,
    'effective_date5': str,
    'business_process_type5': str,
    'business_process_reason5': str,
    'pay_rate_type5': str,
    'base_pay_change5': np.float64,
    'job_profile5': str,
    'time_type5': str,
    'cost_center5': str,
    'effective_date6': str,
    'business_process_type6': str,
    'business_process_reason6': str,
    'pay_rate_type6': str,
    'base_pay_change6': np.float64,
    'job_profile6': str,
    'time_type6': str,
    'cost_center6': str,
    'effective_date7': str,
    'business_process_type7': str,
    'business_process_reason7': str,
    'pay_rate_type7': str,
```

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    'job_profile7': str,
    'time_type7': str,
    'cost_center7': str,
    'effective_date8': str,
    'business_process_type8': str,
    'business_process_reason8': str,
    'pay_rate_type8': str,
    'base_pay_change8': np.float64,
    'job_profile8': str,
    'time_type8': str,
    'cost_center8': str,
    'effective_date9': str,
    'business_process_type9': str,
    'business_process_reason9': str,
    'pay_rate_type9': str,
    'base_pay_change9': np.float64,
    'job_profile9': str,
    'time_type9': str,
    'cost_center9': str,
    'effective_date10': str,
    'business_process_type10': str,
    'business_process_reason10': str,
    'pay_rate_type10': str,
    'base_pay_change10': np.float64,
    'job_profile10': str,
    'time_type10': str,
    'cost_center10': str,
    'effective_date11': str,
    'business_process_type11': str,
    'business_process_reason11': str,
    'pay_rate_type11': str,
    'base_pay_change11': np.float64,
    'job_profile11': str,
    'time_type11': str,
    'cost_center11': str,
    'effective_date12': str,
    'business_process_type12': str,
    'business_process_reason12': str,
    'pay_rate_type12': str,
    'base_pay_change12': np.float64,
    'job_profile12': str,
    'time_type12': str,
    'cost_center12': str,
    'effective_date13': str,
    'business_process_type13': str,
    'business_process_reason13': str,
```

```
    'pay_rate_type13': str,
    'base_pay_change13': np.float64,
    'job_profile13': str,
    'time_type13': str,
    'cost_center13': str,
    'effective_date14': str,
    'business_process_type14': str,
    'business_process_reason14': str,
    'pay_rate_type14': str,
    'job_profile14': str,
    'time_type14': str,
    'cost_center14': str,
    '2015_annual_performance_rating': np.float64,
    '2016_annual_performance_rating': np.float64,
    '2017_annual_performance_rating': np.float64,
    '2018_annual_performance_rating': np.float64
}

parse_dates2 = ['date_of_birth', 'original_hire_date',␣
 ↪'hire_date','termination_date','effective_date1','effective_date2','effective_date3','effec
```

[5]:
```
df = pd.read_csv(CSVPATH.joinpath('active_wd.csv'), dtype=active_wd_schema,␣
 ↪parse_dates=parse_dates)
df2 = pd.read_csv(CSVPATH.joinpath('terminated_wd.csv'),␣
 ↪dtype=terminated_wd_schema, parse_dates=parse_dates2)
```

1.2 Add fields for analysis

[6]:
```
date_received = np.datetime64('2019-07-02')

df['age'] = (date_received - df['date_of_birth']).astype('<m8[Y]')
df['years_of_service'] = (date_received - df['hire_date']).astype('<m8[Y]')
df2['age'] = (date_received - df2['date_of_birth']).astype('<m8[Y]')
df2['years_of_service'] = (date_received - df2['hire_date']).astype('<m8[Y]')
```

1.2.1 Add field for 5-year age groups

[7]:
```
bins= [0,25,30,35,40,45,50,55,60,65,100]
labels = ['<25','25-29','30-34','35-39','40-44',␣
 ↪'45-49','50-54','55-59','60-64','65+']
df['age_group_5'] = pd.cut(df['age'], bins=bins, labels=labels, right=False)
df2['age_group_5'] = pd.cut(df2['age'], bins=bins, labels=labels, right=False)
```

1.2.2 Add field for 10-year age groups

[8]:
```
bins= [0,25,35,45,55,65,100]
labels = ['<25','25-34','35-44','45-54','55-64','65+']
df['age_group_10'] = pd.cut(df['age'], bins=bins, labels=labels, right=False)
df2['age_group_10'] = pd.cut(df2['age'], bins=bins, labels=labels, right=False)
```

1.2.3 Add field for years-of-service groups

[9]:
```
bins= [0,1,3,6,11,16,21,26,100]
labels = ['0','1-2','3-5','6-10','11-15','16-20','21-25','25+']
df['years_of_service_grouped'] = pd.cut(df['years_of_service'], bins=bins,␣
 ↪labels=labels, right=False)
df2['years_of_service_grouped'] = pd.cut(df2['years_of_service'], bins=bins,␣
 ↪labels=labels, right=False)
```

1.2.4 Group departments

[10]:
```
def dept(row):
    NEWS_DEPTS = ['News', 'Editorial', 'News Service and Syndicate']
    COMMERCIAL_DEPTS = [
        'Client Solutions', 'Circulation', 'Finance', 'Marketing', 'WP News␣
 ↪Media Services', 'Production', 'Public Relations', 'Administration',␣
 ↪'Product', 'Audience Development and Insights', 'Customer Care and␣
 ↪Logistics', 'Legal', 'Washington Post Live'
    ]
    if row['department'] in NEWS_DEPTS:
        return 'News'
    elif row['department'] in COMMERCIAL_DEPTS:
        return 'Commercial'
    else:
        return 'Unknown'

df['dept'] = df.apply(lambda row: dept(row), axis=1)
df2['dept'] = df2.apply(lambda row: dept(row), axis=1)
```

1.2.5 Group desks

[11]:
```
def desk(row):
    OPERATIONS = ['110000 News Operations','110001 News Digital Operations']
    AUDIENCE = ['Audience Development and Engagement']
    AUDIO = ['110620 News Audio']
    DESIGN = ['110604 Presentation Design','110605 Presentation']
    EMERGING = ['110664 News National Apps','110665 News The Lily','110666 News␣
 ↪Snapchat','110667 News By The Way']
```

```
    FINANCIAL = ['113210 Economy and Business']
    FOREIGN = ['114000 Foreign Administration','114095 News Foreign Brazil','114100 Foreign Latam','114220 News Foreign Istanbul','114235 Foreign Western Europe','114300 News Foreign West Africa','114415 Foreign Hong Kong','114405 Foreign Beijing Bureau','114105 Foreign Mexico Bureau','114005 Foreign Beirut Bureau','114400 Foreign India Bureau','114410 Foreign Tokyo Bureau','114205 Foreign Islamabad Bureau','114305 Foreign Nairobi Bureau','114240 Foreign Rome Bureau','114200 Foreign London Bureau','114230 Foreign Moscow Bureau','114225 Foreign Cairo Bureau','114215 Foreign Berlin Bureau']
    GRAPHICS = ['110603 Presentation Graphics']
    INVESTIGATIVE = ['110450 Investigative']
    LOCAL = ['112300 Local Politics and Government']
    MULTI = ['110601 Multiplatform Desk']
    NATIONAL = ['110500 Magazine','113200 National Politics and Government','113205 National Security','113215 News National Health & Science','113220 National Enterprise','113235 National America','113240 News National Environment']
    RESEARCH = ['110006 News Content & Research']
    LOGISTICS = ['110455 News Logistics']
    OUTLOOK = ['110410 Book World','110460 Outlook']
    POLLING = ['110475 Polling']
    SPORTS = ['110015 Sports Main']
    STYLE = ['110300 Style','110435 Food','110485 Travel','110495 Local Living','110505 Weekend']
    UNIVERSAL = ['110600 Universal Desk']
    VIDEO = ['110652 News Video - General']
    OTHER = ['110663 Wake Up Report']
    EDITORIAL = ['115000 Editorial Administration']
    if row['cost_center_current'] in OPERATIONS:
        return 'Operations'
    elif row['cost_center_current'] in AUDIENCE:
        return 'Audience Development and Engagement'
    elif row['cost_center_current'] in AUDIO:
        return 'Audio'
    elif row['cost_center_current'] in DESIGN:
        return 'Design'
    elif row['cost_center_current'] in EMERGING:
        return 'Emerging News Products'
    elif row['cost_center_current'] in FINANCIAL:
        return 'Financial'
    elif row['cost_center_current'] in FOREIGN:
        return 'Foreign'
    elif row['cost_center_current'] in GRAPHICS:
        return 'Graphics'
    elif row['cost_center_current'] in LOCAL:
        return 'Local'
```

```
    elif row['cost_center_current'] in MULTI:
        return 'Multiplatform'
    elif row['cost_center_current'] in NATIONAL:
        return 'National'
    elif row['cost_center_current'] in RESEARCH:
        return 'News Content and Research'
    elif row['cost_center_current'] in LOGISTICS:
        return 'News Logistics'
    elif row['cost_center_current'] in OUTLOOK:
        return 'Outlook'
    elif row['cost_center_current'] in POLLING:
        return 'Polling'
    elif row['cost_center_current'] in SPORTS:
        return 'Sports'
    elif row['cost_center_current'] in STYLE:
        return 'Style'
    elif row['cost_center_current'] in UNIVERSAL:
        return 'Universal Desk'
    elif row['cost_center_current'] in VIDEO:
        return 'Video'
    elif row['cost_center_current'] in OTHER:
        return 'Other'
    elif row['cost_center_current'] in EDITORIAL:
        return 'Editorial'
    else:
        return 'non-newsroom'

df['desk'] = df.apply(lambda row: desk(row), axis=1)
df2['desk'] = df2.apply(lambda row: desk(row), axis=1)
```

1.2.6 Group desks by median salary ranges

[12]:
```
def tier(row):
    TIER1 = ['National','Foreign','Financial','Investigative']
    TIER2 = ['Style','Local','Graphics','Universal␣
 ↪Desk','Sports','Outlook','Editorial']
    TIER3 =␣
 ↪['Audio','Polling','Design','Operations','Multiplatform','Video','Audience␣
 ↪Development and Engagement']
    TIER4 = ['News Logistics','News Content and Research','Emerging News␣
 ↪Products','Other']
    if row['desk'] in TIER1:
        return 'Tier 1'
    elif row['desk'] in TIER2:
        return 'Tier 2'
    elif row['desk'] in TIER3:
```

```
        return 'Tier 3'
    elif row['desk'] in TIER4:
        return 'Tier 4'
    else:
        return 'other'

df['tier'] = df.apply(lambda row: tier(row), axis=1)
df2['tier'] = df2.apply(lambda row: tier(row), axis=1)
```

1.2.7 Group race and ethnicity

[13]:
```
def race_groups(row):
    WHITE = ['White (United States of America)']
    NONWHITE = [
        'Black or African American (United States of America)', 'Asian (United␣
 ↪States of America)', 'Hispanic or Latino (United States of America)', 'Two␣
 ↪or More Races (United States of America)', 'American Indian or Alaska Native␣
 ↪(United States of America)', 'Native Hawaiian or Other Pacific Islander␣
 ↪(United States of America)'
    ]
    if row['race_ethnicity'] in WHITE:
        return 'white'
    elif row['race_ethnicity'] in NONWHITE:
        return 'person of color'
    else:
        return 'unknown'

df['race_grouping'] = df.apply(lambda row: race_groups(row), axis=1)
df2['race_grouping'] = df2.apply(lambda row: race_groups(row), axis=1)
```

1.2.8 Employee pay change grouping

[14]:
```
reason_for_change1 =␣
 ↪df[['business_process_reason1','base_pay_change1','effective_date1','pay_rate_type1','gende
 ↪rename(columns={'business_process_reason1':
 ↪'business_process_reason','base_pay_change1':
 ↪'base_pay_change','effective_date1':'effective_date','pay_rate_type1':
 ↪'pay_rate_type'})
reason_for_change2 =␣
 ↪df[['business_process_reason2','base_pay_change2','effective_date2','pay_rate_type2','gende
 ↪rename(columns={'business_process_reason2':
 ↪'business_process_reason','base_pay_change2':
 ↪'base_pay_change','effective_date2':'effective_date','pay_rate_type2':
 ↪'pay_rate_type'})
```

```
reason_for_change3 = 
 df[['business_process_reason3','base_pay_change3','effective_date3','pay_rate_type3','gende
 rename(columns={'business_process_reason3':
 'business_process_reason','base_pay_change3':
 'base_pay_change','effective_date3':'effective_date','pay_rate_type3':
 'pay_rate_type'})
reason_for_change4 = 
 df[['business_process_reason4','base_pay_change4','effective_date4','pay_rate_type4','gende
 rename(columns={'business_process_reason4':
 'business_process_reason','base_pay_change4':
 'base_pay_change','effective_date4':'effective_date','pay_rate_type4':
 'pay_rate_type'})
reason_for_change5 = 
 df[['business_process_reason5','base_pay_change5','effective_date5','pay_rate_type5','gende
 rename(columns={'business_process_reason5':
 'business_process_reason','base_pay_change5':
 'base_pay_change','effective_date5':'effective_date','pay_rate_type5':
 'pay_rate_type'})
reason_for_change6 = 
 df[['business_process_reason6','base_pay_change6','effective_date6','pay_rate_type6','gende
 rename(columns={'business_process_reason6':
 'business_process_reason','base_pay_change6':
 'base_pay_change','effective_date6':'effective_date','pay_rate_type6':
 'pay_rate_type'})
reason_for_change7 = 
 df[['business_process_reason7','base_pay_change7','effective_date7','pay_rate_type7','gende
 rename(columns={'business_process_reason7':
 'business_process_reason','base_pay_change7':
 'base_pay_change','effective_date7':'effective_date','pay_rate_type7':
 'pay_rate_type'})
reason_for_change8 = 
 df[['business_process_reason8','base_pay_change8','effective_date8','pay_rate_type8','gende
 rename(columns={'business_process_reason8':
 'business_process_reason','base_pay_change8':
 'base_pay_change','effective_date8':'effective_date','pay_rate_type8':
 'pay_rate_type'})
reason_for_change9 = 
 df[['business_process_reason9','base_pay_change9','effective_date9','pay_rate_type9','gende
 rename(columns={'business_process_reason9':
 'business_process_reason','base_pay_change9':
 'base_pay_change','effective_date9':'effective_date','pay_rate_type9':
 'pay_rate_type'})
```

```
reason_for_change10 =␣
↪df[['business_process_reason10','base_pay_change10','effective_date10','pay_rate_type10','g
↪rename(columns={'business_process_reason10':
↪'business_process_reason','base_pay_change10':
↪'base_pay_change','effective_date10':'effective_date','pay_rate_type10':
↪'pay_rate_type'})
reason_for_change11 =␣
↪df[['business_process_reason11','base_pay_change11','effective_date11','pay_rate_type11','g
↪rename(columns={'business_process_reason11':
↪'business_process_reason','base_pay_change11':
↪'base_pay_change','effective_date11':'effective_date','pay_rate_type11':
↪'pay_rate_type'})
reason_for_change12 =␣
↪df[['business_process_reason12','base_pay_change12','effective_date12','pay_rate_type12','g
↪rename(columns={'business_process_reason12':
↪'business_process_reason','base_pay_change12':
↪'base_pay_change','effective_date12':'effective_date','pay_rate_type12':
↪'pay_rate_type'})
reason_for_change13 =␣
↪df[['business_process_reason13','base_pay_change13','effective_date13','pay_rate_type13','g
↪rename(columns={'business_process_reason13':
↪'business_process_reason','base_pay_change13':
↪'base_pay_change','effective_date13':'effective_date','pay_rate_type13':
↪'pay_rate_type'})
reason_for_change14 =␣
↪df[['business_process_reason14','base_pay_change14','effective_date14','pay_rate_type14','g
↪rename(columns={'business_process_reason14':
↪'business_process_reason','base_pay_change14':
↪'base_pay_change','effective_date14':'effective_date','pay_rate_type14':
↪'pay_rate_type'})
reason_for_change15 =␣
↪df[['business_process_reason15','base_pay_change15','effective_date15','pay_rate_type15','g
↪rename(columns={'business_process_reason15':
↪'business_process_reason','base_pay_change15':
↪'base_pay_change','effective_date15':'effective_date','pay_rate_type15':
↪'pay_rate_type'})
reason_for_change16 =␣
↪df[['business_process_reason16','base_pay_change16','effective_date16','pay_rate_type16','g
↪rename(columns={'business_process_reason16':
↪'business_process_reason','base_pay_change16':
↪'base_pay_change','effective_date16':'effective_date','pay_rate_type16':
↪'pay_rate_type'})
```

```
reason_for_change17 =␣
↪df[['business_process_reason17','base_pay_change17','effective_date17','pay_rate_type17','g
↪rename(columns={'business_process_reason17':
↪'business_process_reason','base_pay_change17':
↪'base_pay_change','effective_date17':'effective_date','pay_rate_type17':
↪'pay_rate_type'})
reason_for_change18 =␣
↪df[['business_process_reason18','base_pay_change18','effective_date18','pay_rate_type18','g
↪rename(columns={'business_process_reason18':
↪'business_process_reason','base_pay_change18':
↪'base_pay_change','effective_date18':'effective_date','pay_rate_type18':
↪'pay_rate_type'})
reason_for_change19 =␣
↪df2[['business_process_reason1','base_pay_change1','effective_date1','pay_rate_type1','gend
↪rename(columns={'business_process_reason1':
↪'business_process_reason','base_pay_change1':
↪'base_pay_change','effective_date1':'effective_date','pay_rate_type1':
↪'pay_rate_type'})
reason_for_change20 =␣
↪df2[['business_process_reason2','base_pay_change2','effective_date2','pay_rate_type2','gend
↪rename(columns={'business_process_reason2':
↪'business_process_reason','base_pay_change2':
↪'base_pay_change','effective_date2':'effective_date','pay_rate_type2':
↪'pay_rate_type'})
reason_for_change21 =␣
↪df2[['business_process_reason3','base_pay_change3','effective_date3','pay_rate_type3','gend
↪rename(columns={'business_process_reason3':
↪'business_process_reason','base_pay_change3':
↪'base_pay_change','effective_date3':'effective_date','pay_rate_type3':
↪'pay_rate_type'})
reason_for_change22 =␣
↪df2[['business_process_reason4','base_pay_change4','effective_date4','pay_rate_type4','gend
↪rename(columns={'business_process_reason4':
↪'business_process_reason','base_pay_change4':
↪'base_pay_change','effective_date4':'effective_date','pay_rate_type4':
↪'pay_rate_type'})
reason_for_change23 =␣
↪df2[['business_process_reason5','base_pay_change5','effective_date5','pay_rate_type5','gend
↪rename(columns={'business_process_reason5':
↪'business_process_reason','base_pay_change5':
↪'base_pay_change','effective_date5':'effective_date','pay_rate_type5':
↪'pay_rate_type'})
```

```
reason_for_change24 =␣
↪df2[['business_process_reason6','base_pay_change6','effective_date6','pay_rate_type6','gend
↪rename(columns={'business_process_reason6':
↪'business_process_reason','base_pay_change6':
↪'base_pay_change','effective_date6':'effective_date','pay_rate_type6':
↪'pay_rate_type'})
reason_for_change25 =␣
↪df2[['business_process_reason7','base_pay_change7','effective_date7','pay_rate_type7','gend
↪rename(columns={'business_process_reason7':
↪'business_process_reason','base_pay_change7':
↪'base_pay_change','effective_date7':'effective_date','pay_rate_type7':
↪'pay_rate_type'})
reason_for_change26 =␣
↪df2[['business_process_reason8','base_pay_change8','effective_date8','pay_rate_type8','gend
↪rename(columns={'business_process_reason8':
↪'business_process_reason','base_pay_change8':
↪'base_pay_change','effective_date8':'effective_date','pay_rate_type8':
↪'pay_rate_type'})
reason_for_change27 =␣
↪df2[['business_process_reason9','base_pay_change9','effective_date9','pay_rate_type9','gend
↪rename(columns={'business_process_reason9':
↪'business_process_reason','base_pay_change9':
↪'base_pay_change','effective_date9':'effective_date','pay_rate_type9':
↪'pay_rate_type'})
reason_for_change28 =␣
↪df2[['business_process_reason10','base_pay_change10','effective_date10','pay_rate_type10','
↪rename(columns={'business_process_reason10':
↪'business_process_reason','base_pay_change10':
↪'base_pay_change','effective_date10':'effective_date','pay_rate_type10':
↪'pay_rate_type'})
reason_for_change29 =␣
↪df2[['business_process_reason11','base_pay_change11','effective_date11','pay_rate_type11','
↪rename(columns={'business_process_reason11':
↪'business_process_reason','base_pay_change11':
↪'base_pay_change','effective_date11':'effective_date','pay_rate_type11':
↪'pay_rate_type'})
reason_for_change30 =␣
↪df2[['business_process_reason12','base_pay_change12','effective_date12','pay_rate_type12','
↪rename(columns={'business_process_reason12':
↪'business_process_reason','base_pay_change12':
↪'base_pay_change','effective_date12':'effective_date','pay_rate_type12':
↪'pay_rate_type'})
```

```
reason_for_change31 =␣
 ↪df2[['business_process_reason13','base_pay_change13','effective_date13','pay_rate_type13','
 ↪rename(columns={'business_process_reason13':
 ↪'business_process_reason','base_pay_change13':
 ↪'base_pay_change','effective_date13':'effective_date','pay_rate_type13':
 ↪'pay_rate_type'})
reason_for_change1 = pd.DataFrame(reason_for_change1)
reason_for_change2 = pd.DataFrame(reason_for_change2)
reason_for_change3 = pd.DataFrame(reason_for_change3)
reason_for_change4 = pd.DataFrame(reason_for_change4)
reason_for_change5 = pd.DataFrame(reason_for_change5)
reason_for_change6 = pd.DataFrame(reason_for_change6)
reason_for_change7 = pd.DataFrame(reason_for_change7)
reason_for_change8 = pd.DataFrame(reason_for_change8)
reason_for_change9 = pd.DataFrame(reason_for_change9)
reason_for_change10 = pd.DataFrame(reason_for_change10)
reason_for_change11 = pd.DataFrame(reason_for_change11)
reason_for_change12 = pd.DataFrame(reason_for_change12)
reason_for_change13 = pd.DataFrame(reason_for_change13)
reason_for_change14 = pd.DataFrame(reason_for_change14)
reason_for_change15 = pd.DataFrame(reason_for_change15)
reason_for_change16 = pd.DataFrame(reason_for_change16)
reason_for_change17 = pd.DataFrame(reason_for_change17)
reason_for_change18 = pd.DataFrame(reason_for_change18)
reason_for_change19 = pd.DataFrame(reason_for_change19)
reason_for_change20 = pd.DataFrame(reason_for_change20)
reason_for_change21 = pd.DataFrame(reason_for_change21)
reason_for_change22 = pd.DataFrame(reason_for_change22)
reason_for_change23 = pd.DataFrame(reason_for_change23)
reason_for_change24 = pd.DataFrame(reason_for_change24)
reason_for_change25 = pd.DataFrame(reason_for_change25)
reason_for_change26 = pd.DataFrame(reason_for_change26)
reason_for_change27 = pd.DataFrame(reason_for_change27)
reason_for_change28 = pd.DataFrame(reason_for_change28)
reason_for_change29 = pd.DataFrame(reason_for_change29)
reason_for_change30 = pd.DataFrame(reason_for_change30)
reason_for_change31 = pd.DataFrame(reason_for_change31)

reason_for_change_combined = pd.
 ↪concat([reason_for_change1,reason_for_change2,reason_for_change3,reason_for_change4,reason_
```

1.2.9 Employee performance evaluation grouping

[15]:
```
fifteen1 =␣
 ↪df[['2015_annual_performance_rating','gender','race_ethnicity','race_grouping','dept']].
 ↪rename(columns={'2015_annual_performance_rating':'performance_rating'})
```

```
fifteen2 =␣
↪df2[['2015_annual_performance_rating','gender','race_ethnicity','race_grouping','dept']].
↪rename(columns={'2015_annual_performance_rating':'performance_rating'})
sixteen1 =␣
↪df[['2016_annual_performance_rating','gender','race_ethnicity','race_grouping','dept']].
↪rename(columns={'2016_annual_performance_rating':'performance_rating'})
sixteen2 =␣
↪df2[['2016_annual_performance_rating','gender','race_ethnicity','race_grouping','dept']].
↪rename(columns={'2016_annual_performance_rating':'performance_rating'})
seventeen1 =␣
↪df[['2017_annual_performance_rating','gender','race_ethnicity','race_grouping','dept']].
↪rename(columns={'2017_annual_performance_rating':'performance_rating'})
seventeen2 =␣
↪df2[['2017_annual_performance_rating','gender','race_ethnicity','race_grouping','dept']].
↪rename(columns={'2017_annual_performance_rating':'performance_rating'})
eighteen1 =␣
↪df[['2018_annual_performance_rating','gender','race_ethnicity','race_grouping','dept']].
↪rename(columns={'2018_annual_performance_rating':'performance_rating'})
eighteen2 =␣
↪df2[['2018_annual_performance_rating','gender','race_ethnicity','race_grouping','dept']].
↪rename(columns={'2018_annual_performance_rating':'performance_rating'})
fifteen1 = pd.DataFrame(fifteen1)
fifteen2 = pd.DataFrame(fifteen2)
sixteen1 = pd.DataFrame(sixteen1)
sixteen2 = pd.DataFrame(sixteen2)
seventeen1 = pd.DataFrame(seventeen1)
seventeen2 = pd.DataFrame(seventeen2)
eighteen1 = pd.DataFrame(eighteen1)
eighteen2 = pd.DataFrame(eighteen2)

ratings_combined = pd.
↪concat([fifteen1,fifteen2,sixteen1,sixteen2,seventeen1,seventeen2,eighteen1,eighteen2])
```

1.2.10 Create departmental data frames

[16]:
```
news_salaried = df[(df['dept'] == 'News') & (df['pay_rate_type'] == 'Salaried')]
news_hourly = df[(df['dept'] == 'News') & (df['pay_rate_type'] == 'Hourly')]
commercial_salaried = df[(df['dept'] == 'Commercial') & (df['pay_rate_type'] ==␣
↪'Salaried')]
commercial_hourly = df[(df['dept'] == 'Commercial') & (df['pay_rate_type'] ==␣
↪'Hourly')]

news_salaried2 = df2[(df2['dept'] == 'News') & (df2['pay_rate_type'] ==␣
↪'Salaried')]
news_hourly2 = df2[(df2['dept'] == 'News') & (df2['pay_rate_type'] == 'Hourly')]
```

```python
commercial_salaried2 = df2[(df2['dept'] == 'Commercial') &␣
 ↪(df2['pay_rate_type'] == 'Salaried')]
commercial_hourly2 = df2[(df2['dept'] == 'Commercial') & (df2['pay_rate_type']␣
 ↪== 'Hourly')]
```

1.3 Supress Results

1.3.1 Suppress results where there are less than five employees

[17]:
```python
df['count'] = 1
df2['count'] = 1

def suppress(results):
    results.columns = results.columns.get_level_values(1)
    return results[results['count_nonzero'] >= 5]
```

1.3.2 Suppress results and order them by count of employees

[18]:
```python
def suppress_count(results):
    results.columns = results.columns.get_level_values(1)
    return results[results['count_nonzero'] >= 5].sort_values('count_nonzero',␣
 ↪ascending=False)
```

1.3.3 Suppress results and order them by median salary of employees

[19]:
```python
def suppress_median(results):
    results.columns = results.columns.get_level_values(1)
    return results[results['count_nonzero'] >= 5].sort_values('median',␣
 ↪ascending=False)
```

1.4 Summary Analysis

1.4.1 Employee counts

[20]:
```python
current_employee_count = df.shape[0]
terminated_employee_count = df2.shape[0]

print('Total employees in data: ' + str(current_employee_count +␣
 ↪terminated_employee_count))
print('Current employees: ' + str(current_employee_count))
print('Terminated employees: ' + str(terminated_employee_count))
```

```
Total employees in data: 1489
Current employees: 950
Terminated employees: 539
```

[21]:
```
current_salaried_employee_count = df[df['pay_rate_type'] == 'Salaried'].shape[0]
terminated_salaried_employee_count = df2[df2['pay_rate_type'] == 'Salaried'].
 ↪shape[0]

print('Total salaried employees in data: ' +␣
 ↪str(current_salaried_employee_count + terminated_salaried_employee_count))
print('Current salaried employees: ' + str(current_salaried_employee_count))
print('Terminated salaried employees: ' +␣
 ↪str(terminated_salaried_employee_count))
```

```
Total salaried employees in data: 989
Current salaried employees: 707
Terminated salaried employees: 282
```

[22]:
```
current_hourly_employee_count = df[df['pay_rate_type'] == 'Hourly'].shape[0]
terminated_hourly_employee_count = df2[df2['pay_rate_type'] == 'Hourly'].
 ↪shape[0]

print('Total hourly employees in data: ' + str(current_hourly_employee_count +␣
 ↪terminated_hourly_employee_count))
print('Current hourly employees: ' + str(current_hourly_employee_count))
print('Terminated hourly employees: ' + str(terminated_hourly_employee_count))
```

```
Total hourly employees in data: 500
Current hourly employees: 243
Terminated hourly employees: 257
```

1.4.2 Salary information

[23]:
```
current_mean_salary = df[df['pay_rate_type'] == 'Salaried']['current_base_pay'].
 ↪mean()
current_median_salary = df[df['pay_rate_type'] ==␣
 ↪'Salaried']['current_base_pay'].median()

print('The mean yearly pay for current salaried employees is $' +␣
 ↪str(current_mean_salary) + '.')
print('The median yearly pay for current salaried employees is $' +␣
 ↪str(current_median_salary) + '.')
```

```
The mean yearly pay for current salaried employees is $112382.98421499293.
The median yearly pay for current salaried employees is $99903.95.
```

[24]:
```
current_mean_hourly = df[df['pay_rate_type'] == 'Hourly']['current_base_pay'].
 ↪mean()
current_median_hourly = df[df['pay_rate_type'] == 'Hourly']['current_base_pay'].
 ↪median()
```

```
print('The mean rate for current hourly employees at The Washington Post is $'␣
↪+ str(current_mean_hourly) + '.')
print('The median rate for current hourly employees at The Washington Post is␣
↪$' + str(current_median_hourly) + '.')
```

```
The mean rate for current hourly employees at The Washington Post is
$30.197119341563788.
The median rate for current hourly employees at The Washington Post is $29.23.
```

1.4.3 Employee gender

[25]:
```
current_employee_gender = df.groupby(['gender']).agg({'current_base_pay': [np.
↪count_nonzero]})
suppress(current_employee_gender)
```

[25]:
```
        count_nonzero
gender
Female         507.00
Male           443.00
```

[26]:
```
terminated_employee_gender = df2.groupby(['gender']).agg({'current_base_pay':␣
↪[np.count_nonzero]})
suppress(terminated_employee_gender)
```

[26]:
```
        count_nonzero
gender
Female         291.00
Male           246.00
```

[27]:
```
current_median_salary_gender = df[df['pay_rate_type'] == 'Salaried'].
↪groupby(['gender']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_median_salary_gender)
```

[27]:
```
        count_nonzero    median
gender
Female         370.00  91815.82
Male           337.00 109928.29
```

[28]:
```
current_median_hourly_gender = df[df['pay_rate_type'] == 'Hourly'].
↪groupby(['gender']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_median_hourly_gender)
```

[28]:
```
        count_nonzero  median
gender
Female         137.00   30.77
Male           106.00   25.84
```

[29]:
```
current_age_gender_salaried = df[df['pay_rate_type'] == 'Salaried'].
↪groupby(['gender'])['age'].median().sort_values(ascending=False)
current_age_gender_salaried
```

[29]:
```
gender
Male      41.00
Female    35.00
Name: age, dtype: float64
```

1.4.4 Employee race and ethnicity

[30]:
```
current_employee_race_ethnicity = df.groupby(['race_ethnicity']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_employee_race_ethnicity)
```

[30]:
```
                                                     count_nonzero
race_ethnicity
White (United States of America)                            612.00
Black or African American (United States of Ame...          157.00
Asian (United States of America)                             77.00
Hispanic or Latino (United States of America)                45.00
Two or More Races (United States of America)                 18.00
Prefer Not to Disclose (United States of America)            14.00
```

[31]:
```
terminated_employee_race_ethnicity = df2.groupby(['race_ethnicity']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(terminated_employee_race_ethnicity)
```

[31]:
```
                                                     count_nonzero
race_ethnicity
White (United States of America)                            290.00
Black or African American (United States of Ame...          162.00
Asian (United States of America)                             46.00
Hispanic or Latino (United States of America)                20.00
Two or More Races (United States of America)                 10.00
Prefer Not to Disclose (United States of America)             7.00
```

[32]:
```
current_median_salary_race = df[df['pay_rate_type'] == 'Salaried'].
↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
↪median]})
suppress_median(current_median_salary_race)
```

[32]:
```
                                                     count_nonzero    median
race_ethnicity
White (United States of America)                            505.00 102880.00
Black or African American (United States of Ame...           62.00  91881.24
Asian (United States of America)                             59.00  90780.00
Prefer Not to Disclose (United States of America)            10.00  82140.00
Hispanic or Latino (United States of America)                33.00  82000.00
Two or More Races (United States of America)                 14.00  79860.00
```

[33]:
```

```

```
current_median_hourly_race = df[df['pay_rate_type'] == 'Hourly'].
  ↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
  ↪median]})
suppress_median(current_median_hourly_race)
```

[33]:

```
                                                        count_nonzero  median
race_ethnicity
White (United States of America)                               107.00   32.71
Asian (United States of America)                                18.00   27.30
Hispanic or Latino (United States of America)                   12.00   25.62
Black or African American (United States of Ame...              95.00   25.16
```

[34]:

```
current_age_race_salaried = df[df['pay_rate_type'] == 'Salaried'].
  ↪groupby(['race_ethnicity'])['age'].median().sort_values(ascending=False)
current_age_race_salaried
```

[34]:

```
race_ethnicity
American Indian or Alaska Native (United States of America)            49.50
Native Hawaiian or Other Pacific Islander (United States of America)   43.00
Black or African American (United States of America)                   41.50
White (United States of America)                                       39.00
Hispanic or Latino (United States of America)                          37.00
Asian (United States of America)                                       33.00
Prefer Not to Disclose (United States of America)                      31.50
Two or More Races (United States of America)                           28.00
Name: age, dtype: float64
```

[35]:

```
current_age_race_hourly = df[df['pay_rate_type'] == 'Hourly'].
  ↪groupby(['race_ethnicity'])['age'].median().sort_values(ascending=False)
current_age_race_hourly
```

[35]:

```
race_ethnicity
American Indian or Alaska Native (United States of America)   53.50
Black or African American (United States of America)          47.00
White (United States of America)                              39.00
Asian (United States of America)                              32.00
Prefer Not to Disclose (United States of America)             30.00
Hispanic or Latino (United States of America)                 29.50
Two or More Races (United States of America)                  26.50
Name: age, dtype: float64
```

1.4.5 Employee gender x race/ethnicity

[36]:

```
current_employee_race_gender = df.groupby(['race_ethnicity','gender']).
  ↪agg({'current_base_pay': [np.count_nonzero]})
suppress(current_employee_race_gender)
```

[36]:

```
                                                                count_nonzero
race_ethnicity                                          gender
```

```
Asian (United States of America)                           Female          53.00
                                                           Male            24.00
Black or African American (United States of Ame...  Female          80.00
                                                           Male            77.00
Hispanic or Latino (United States of America)         Female          24.00
                                                           Male            21.00
Prefer Not to Disclose (United States of America)  Female           6.00
                                                           Male             8.00
Two or More Races (United States of America)         Female          12.00
                                                           Male             6.00
White (United States of America)                           Female         318.00
                                                           Male           294.00
```

[37]:
```python
current_salaried_race_gender = df[df['pay_rate_type'] == 'Salaried'].
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero]})
suppress(current_salaried_race_gender)
```

[37]:
```
                                                                   count_nonzero
race_ethnicity                                             gender
Asian (United States of America)                           Female          42.00
                                                           Male            17.00
Black or African American (United States of Ame...  Female          31.00
                                                           Male            31.00
Hispanic or Latino (United States of America)         Female          16.00
                                                           Male            17.00
Prefer Not to Disclose (United States of America)  Female           5.00
                                                           Male             5.00
Two or More Races (United States of America)         Female           9.00
                                                           Male             5.00
White (United States of America)                           Female         255.00
                                                           Male           250.00
```

[38]:
```python
current_hourly_race_gender = df[df['pay_rate_type'] == 'Hourly'].
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero]})
suppress(current_hourly_race_gender)
```

[38]:
```
                                                                   count_nonzero
race_ethnicity                                             gender
Asian (United States of America)                           Female          11.00
                                                           Male             7.00
Black or African American (United States of Ame...  Female          49.00
                                                           Male            46.00
Hispanic or Latino (United States of America)         Female           8.00
White (United States of America)                           Female          63.00
                                                           Male            44.00
```

[39]:
```
current_median_salary_race_gender = df[df['pay_rate_type'] == 'Salaried'].
↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_median_salary_race_gender)
```

[39]:
```
                                                            count_nonzero  \
race_ethnicity                                      gender
Asian (United States of America)                    Female          42.00
                                                    Male            17.00
Black or African American (United States of Ame... Female          31.00
                                                    Male            31.00
Hispanic or Latino (United States of America)       Female          16.00
                                                    Male            17.00
Prefer Not to Disclose (United States of America)  Female           5.00
                                                    Male             5.00
Two or More Races (United States of America)        Female           9.00
                                                    Male             5.00
White (United States of America)                    Female         255.00
                                                    Male           250.00

                                                               median
race_ethnicity                                      gender
Asian (United States of America)                    Female   91115.00
                                                    Male     90431.45
Black or African American (United States of Ame... Female   87808.33
                                                    Male     99931.09
Hispanic or Latino (United States of America)       Female   80250.00
                                                    Male     90780.00
Prefer Not to Disclose (United States of America)  Female   73000.00
                                                    Male     88280.00
Two or More Races (United States of America)        Female   75000.00
                                                    Male     94875.00
White (United States of America)                    Female   95780.00
                                                    Male    111035.50
```

[40]:
```
current_median_hourly_race_gender = df[df['pay_rate_type'] == 'Hourly'].
↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_median_hourly_race_gender)
```

[40]:
```
                                                            count_nonzero  \
race_ethnicity                                      gender
Asian (United States of America)                    Female          11.00
                                                    Male             7.00
Black or African American (United States of Ame... Female          49.00
                                                    Male            46.00
Hispanic or Latino (United States of America)       Female           8.00
White (United States of America)                    Female          63.00
```

```
                                                              Male         44.00

                                                                      median
race_ethnicity                                                gender
Asian (United States of America)                              Female   28.30
                                                              Male     26.30
Black or African American (United States of Ame...            Female   26.82
                                                              Male     23.20
Hispanic or Latino (United States of America)                 Female   28.17
White (United States of America)                              Female   33.46
                                                              Male     31.00
```

1.4.6 Employee age

[41]:
```python
current_employee_age_5 = df.groupby(['age_group_5']).agg({'current_base_pay':
 ↪[np.count_nonzero]})
suppress(current_employee_age_5)
```

[41]:
```
             count_nonzero
age_group_5
<25                  59.00
25-29               171.00
30-34               139.00
35-39               125.00
40-44                98.00
45-49                80.00
50-54               105.00
55-59                84.00
60-64                56.00
65+                  33.00
```

[42]:
```python
terminated_employee_age_5 = df2.groupby(['age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero]})
suppress(terminated_employee_age_5)
```

[42]:
```
             count_nonzero
age_group_5
<25                   7.00
25-29               117.00
30-34               115.00
35-39                56.00
40-44                52.00
45-49                40.00
50-54                33.00
55-59                42.00
60-64                29.00
65+                  44.00
```

[43]:
```
current_employee_age_10 = df.groupby(['age_group_10']).agg({'current_base_pay':␣
↪[np.count_nonzero]})
suppress(current_employee_age_10)
```

[43]:
```
              count_nonzero
age_group_10
<25                   59.00
25-34                310.00
35-44                223.00
45-54                185.00
55-64                140.00
65+                   33.00
```

[44]:
```
terminated_employee_age_10 = df2.groupby(['age_group_10']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress(terminated_employee_age_10)
```

[44]:
```
              count_nonzero
age_group_10
<25                    7.00
25-34                232.00
35-44                108.00
45-54                 73.00
55-64                 71.00
65+                   44.00
```

[45]:
```
current_median_salary_age_5 = df[df['pay_rate_type'] == 'Salaried'].
↪groupby(['age_group_5']).agg({'current_base_pay': [np.median, np.
↪count_nonzero]})
suppress(current_median_salary_age_5)
```

[45]:
```
                median  count_nonzero
age_group_5
<25           64640.00          34.00
25-29         80000.00         126.00
30-34         92500.00         119.00
35-39        105301.31         104.00
40-44        125924.46          72.00
45-49         99502.50          56.00
50-54        110844.65          80.00
55-59        139716.51          61.00
60-64        113134.31          38.00
65+          153061.00          17.00
```

[46]:
```
current_median_hourly_age_5 = df[df['pay_rate_type'] == 'Hourly'].
↪groupby(['age_group_5']).agg({'current_base_pay': [np.median, np.
↪count_nonzero]})
suppress(current_median_hourly_age_5)
```

[46]:
```
               median  count_nonzero
age_group_5
<25             25.64          25.00
25-29           30.77          45.00
30-34           30.61          20.00
35-39           31.24          21.00
40-44           29.48          26.00
45-49           31.40          24.00
50-54           26.14          25.00
55-59           27.05          23.00
60-64           24.98          18.00
65+             27.26          16.00
```

[47]:
```
current_median_salary_age_10 = df[df['pay_rate_type'] == 'Salaried'].
 ↪groupby(['age_group_10']).agg({'current_base_pay': [np.median, np.
 ↪count_nonzero]})
suppress(current_median_salary_age_10)
```

[47]:
```
                  median  count_nonzero
age_group_10
<25             64640.00          34.00
25-34           85500.00         245.00
35-44          115118.47         176.00
45-54          108202.32         136.00
55-64          127059.40          99.00
65+            153061.00          17.00
```

[48]:
```
current_median_hourly_age_10 = df[df['pay_rate_type'] == 'Hourly'].
 ↪groupby(['age_group_10']).agg({'current_base_pay': [np.median, np.
 ↪count_nonzero]})
suppress(current_median_hourly_age_10)
```

[48]:
```
                median  count_nonzero
age_group_10
<25              25.64          25.00
25-34            30.77          65.00
35-44            30.77          47.00
45-54            28.30          49.00
55-64            26.46          41.00
65+              27.26          16.00
```

1.4.7 Employee department

[49]:
```
current_employee_dept = df.groupby(['dept']).agg({'current_base_pay': [np.
 ↪count_nonzero]})
suppress_count(current_employee_dept)
```

[49]:
```
            count_nonzero
dept
```

```
News                670.00
Commercial          280.00
```

[50]:
```
current_employee_department = df.groupby(['department']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_employee_department)
```

[50]:
```
                        count_nonzero
department
News                           632.00
Client Solutions               164.00
Circulation                     49.00
Editorial                       38.00
Finance                         31.00
Marketing                       11.00
WP News Media Services           9.00
Production                       6.00
Public Relations                 5.00
```

[51]:
```
current_employee_dept_salary = df[df['pay_rate_type'] == 'Salaried'].
↪groupby(['dept']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_employee_dept_salary)
```

[51]:
```
            count_nonzero    median
dept
News               574.00 104669.96
Commercial         133.00  86104.69
```

[52]:
```
current_employee_department_salary = df[df['pay_rate_type'] == 'Salaried'].
↪groupby(['department']).agg({'current_base_pay': [np.count_nonzero, np.
↪median]})
suppress_median(current_employee_department_salary)
```

[52]:
```
                        count_nonzero    median
department
Editorial                       33.00 105000.00
News                           541.00 104559.92
Finance                          8.00  90575.50
WP News Media Services           9.00  86104.69
Client Solutions               102.00  85633.86
Marketing                        7.00  81196.11
Production                       5.00  71665.06
```

[53]:
```
current_employee_dept_hourly = df[df['pay_rate_type'] == 'Hourly'].
↪groupby(['dept']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_employee_dept_hourly)
```

[53]:
```
            count_nonzero  median
dept
News                96.00   33.05
Commercial         147.00   26.27
```

[54]:
```
current_employee_department_hourly = df[df['pay_rate_type'] == 'Hourly'].
↪groupby(['department']).agg({'current_base_pay': [np.count_nonzero, np.
↪median]})
suppress_median(current_employee_department_hourly)
```

[54]:
```
                    count_nonzero  median
department
Public Relations             5.00   35.01
News                        91.00   33.12
Editorial                    5.00   32.31
Client Solutions            62.00   29.41
Finance                     23.00   29.23
Circulation                 49.00   22.44
```

1.4.8 Employee cost center

[55]:
```
current_employee_desk = df.groupby(['desk']).agg({'current_base_pay': [np.
↪count_nonzero]})
suppress_count(current_employee_desk)
```

[55]:
```
                          count_nonzero
desk
non-newsroom                     316.00
National                         118.00
Local                             70.00
Style                             54.00
Video                             50.00
Sports                            48.00
Design                            46.00
Multiplatform                     42.00
Financial                         38.00
Editorial                         38.00
Emerging News Products            31.00
Foreign                           27.00
Universal Desk                    16.00
Graphics                          15.00
Operations                        13.00
Audio                             13.00
Outlook                            8.00
```

[56]:
```
current_employee_cost_center = df.groupby(['cost_center_current']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_employee_cost_center)
```

[56]:
```
                                                count_nonzero
cost_center_current
112300 Local Politics and Government                    70.00
113200 National Politics and Government                 63.00
```

110652	News Video - General	50.00
110015	Sports Main	48.00
110601	Multiplatform Desk	42.00
110300	Style	39.00
119065	Dispatch Operations (Night Circulation)	39.00
115000	Editorial Administration	38.00
113210	Economy and Business	38.00
110605	Presentation	24.00
110610	Audience Development and Engagement	23.00
117682	Global Sales	22.00
110604	Presentation Design	22.00
117694	Digital Ad Sales - BrandStudio	20.00
117693	Digital Ad Sales - Planning	19.00
113205	National Security	17.00
110600	Universal Desk	16.00
110603	Presentation Graphics	15.00
126020	Revenue Administration	14.00
113215	News National Health & Science	14.00
110450	Investigative	13.00
110620	News Audio	13.00
110664	News National Apps	12.00
113235	National America	12.00
116010	Research	11.00
117720	Health	10.00
117525	National Retailers	10.00
110667	News By The Way	9.00
126060	Circulation Accounting	9.00
129300	WP News Media Services	9.00
110000	News Operations	7.00
117005	Creative Services	7.00
110666	News Snapchat	6.00
120005	Makeup	6.00
117320	Real Estate	6.00
117600	Leadership Executive	6.00
117004	Advertising Marketing	6.00
114000	Foreign Administration	6.00
110001	News Digital Operations	6.00
126010	General Ledger	6.00
110495	Local Living	6.00
129100	Community	5.00
110435	Food	5.00
110460	Outlook	5.00
117210	Production Creative	5.00
119026	Customer Contact Center	5.00
118150	WP Live	5.00
117310	Consumer to Consumer Team I	5.00
117405	Jobs Tactical	5.00

```
113240 News National Environment                          5.00
```

[57]:
```python
current_employee_desk_salary = df[df['pay_rate_type'] == 'Salaried'].
 ↪groupby(['desk']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_employee_desk_salary)
```

[57]:
```
                        count_nonzero    median
desk
National                       106.00 149520.50
Foreign                         25.00 135000.00
Financial                       38.00 133509.94
Style                           45.00 107170.81
Local                           65.00 105780.00
Editorial                       33.00 105000.00
Graphics                        15.00 100780.00
Universal Desk                   8.00 100444.28
Sports                          37.00 100000.00
Outlook                          6.00  99937.50
Audio                            7.00  92000.00
Design                          45.00  88065.25
Operations                       6.00  87890.00
non-newsroom                   162.00  87355.95
Multiplatform                   26.00  86104.00
Video                           46.00  84250.00
Emerging News Products          30.00  75000.00
```

[58]:
```python
current_employee_cost_center_salary = df[df['pay_rate_type'] == 'Salaried'].
 ↪groupby(['cost_center_current']).agg({'current_base_pay': [np.count_nonzero,␣
 ↪np.median]})
suppress_median(current_employee_cost_center_salary)
```

[58]:
```
                                                count_nonzero    median
cost_center_current
113205 National Security                                17.00 172780.00
117682 Global Sales                                     21.00 164984.25
113200 National Politics and Government                 55.00 145980.00
113235 National America                                 12.00 137123.72
113215 News National Health & Science                   12.00 135594.87
113210 Economy and Business                             38.00 133509.94
110450 Investigative                                    13.00 129780.00
117600 Leadership Executive                              5.00 127500.00
113240 News National Environment                         5.00 126080.00
110300 Style                                            36.00 115177.72
112300 Local Politics and Government                    65.00 105780.00
115000 Editorial Administration                         33.00 105000.00
110603 Presentation Graphics                            15.00 100780.00
110600 Universal Desk                                    8.00 100444.28
110015 Sports Main                                      37.00 100000.00
117525 National Retailers                                8.00  99499.70
```

```
110605 Presentation                                        24.00  96711.85
110460 Outlook                                              5.00  94875.00
110620 News Audio                                           7.00  92000.00
126010 General Ledger                                       6.00  90575.50
117720 Health                                              10.00  87924.59
110001 News Digital Operations                              6.00  87890.00
129300 WP News Media Services                               9.00  86104.69
110601 Multiplatform Desk                                  26.00  86104.00
117694 Digital Ad Sales - BrandStudio                      18.00  85000.00
110652 News Video - General                                46.00  84250.00
110610 Audience Development and Engagement                 16.00  83530.00
116010 Research                                             7.00  81196.11
110667 News By The Way                                      9.00  80000.00
110604 Presentation Design                                 21.00  78641.52
110666 News Snapchat                                        6.00  76890.00
117005 Creative Services                                    6.00  75587.35
120005 Makeup                                               5.00  71665.06
110664 News National Apps                                  11.00  68780.01
117693 Digital Ad Sales - Planning                         19.00  68000.00
```

[59]:
```
current_employee_desk_hourly = df[df['pay_rate_type'] == 'Hourly'].
 ↪groupby(['desk']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_employee_desk_hourly)
```

[59]:
```
                count_nonzero  median
desk
Audio                    6.00   39.75
Universal Desk           8.00   38.67
Multiplatform           16.00   34.09
Editorial                5.00   32.31
National                12.00   31.74
non-newsroom           154.00   26.57
Local                    5.00   26.46
Style                    9.00   21.77
Sports                  11.00   20.91
Operations               7.00   15.59
```

[60]:
```
current_employee_cost_center_hourly = df[df['pay_rate_type'] == 'Hourly'].
 ↪groupby(['cost_center_current']).agg({'current_base_pay': [np.count_nonzero,␣
 ↪np.median]})
suppress_median(current_employee_cost_center_hourly)
```

[60]:
```
                                                count_nonzero  median
cost_center_current
110620 News Audio                                        6.00   39.75
110600 Universal Desk                                    8.00   38.67
110610 Audience Development and Engagement               7.00   37.58
129100 Community                                         5.00   35.01
110601 Multiplatform Desk                               16.00   34.09
```

```
115000 Editorial Administration                         5.00    32.31
126060 Circulation Accounting                           9.00    30.51
113200 National Politics and Government                 8.00    30.49
126020 Revenue Administration                          14.00    28.75
117210 Production Creative                              5.00    28.13
112300 Local Politics and Government                    5.00    26.46
117310 Consumer to Consumer Team I                      5.00    24.71
117405 Jobs Tactical                                    5.00    24.32
119065 Dispatch Operations (Night Circulation)         39.00    22.44
110015 Sports Main                                     11.00    20.91
119026 Customer Contact Center                          5.00    20.51
110000 News Operations                                  7.00    15.59
```

1.4.9 Employee years of service

[61]:
```
current_employee_yos = df.groupby(['years_of_service_grouped']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress(current_employee_yos)
```

[61]:
```
                          count_nonzero
years_of_service_grouped
0                                138.00
1-2                              223.00
3-5                              195.00
6-10                             109.00
11-15                             80.00
16-20                            102.00
21-25                             46.00
25+                               57.00
```

[62]:
```
terminated_employee_yos = df2.groupby(['years_of_service_grouped']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress(terminated_employee_yos)
```

[62]:
```
                          count_nonzero
years_of_service_grouped
0                                  8.00
1-2                               78.00
3-5                              196.00
6-10                             119.00
11-15                             51.00
16-20                             44.00
21-25                             12.00
25+                               29.00
```

[63]:
```
current_employee_yos_salary = df[df['pay_rate_type'] == 'Salaried'].
↪groupby(['years_of_service_grouped']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
```

```
suppress(current_employee_yos_salary)
```

[63]:

```
                         count_nonzero    median
years_of_service_grouped
0                                96.00  85000.00
1-2                             164.00  91776.89
3-5                             172.00  92305.85
6-10                             75.00 106602.62
11-15                            56.00 107685.39
16-20                            74.00 125300.67
21-25                            32.00 128485.24
25+                              38.00 131793.39
```

[64]:

```
current_employee_yos_hourly = df[df['pay_rate_type'] == 'Hourly'].
 ↪groupby(['years_of_service_grouped']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_employee_yos_hourly)
```

[64]:

```
                         count_nonzero  median
years_of_service_grouped
0                                42.00   27.70
1-2                              59.00   31.68
3-5                              23.00   27.05
6-10                             34.00   29.25
11-15                            24.00   32.41
16-20                            28.00   27.78
21-25                            14.00   31.14
25+                              19.00   26.82
```

[65]:

```
current_employee_yos_gender = df.groupby(['years_of_service_grouped','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero]})
suppress(current_employee_yos_gender)
```

[65]:

```
                                count_nonzero
years_of_service_grouped gender
0                        Female         82.00
                         Male           56.00
1-2                      Female        132.00
                         Male           91.00
3-5                      Female         96.00
                         Male           99.00
6-10                     Female         51.00
                         Male           58.00
11-15                    Female         41.00
                         Male           39.00
16-20                    Female         48.00
                         Male           54.00
21-25                    Female         25.00
                         Male           21.00
```

```
25+                        Female          32.00
                           Male            25.00
```

[66]:
```
current_employee_yos_gender_salary = df[df['pay_rate_type'] == 'Salaried'].
 ↪groupby(['years_of_service_grouped','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_employee_yos_gender_salary)
```

[66]:
```
                                 count_nonzero    median
years_of_service_grouped gender
0                        Female          61.00  80000.00
                         Male            35.00 100000.00
1-2                      Female          96.00  85780.00
                         Male            68.00  96737.80
3-5                      Female          88.00  89724.74
                         Male            84.00  95265.36
6-10                     Female          38.00  99499.70
                         Male            37.00 117843.50
11-15                    Female          28.00  98141.60
                         Male            28.00 126910.89
16-20                    Female          31.00 121140.00
                         Male            43.00 127059.40
21-25                    Female          13.00 134780.00
                         Male            19.00  99012.31
25+                      Female          15.00 139831.30
                         Male            23.00 127476.17
```

[67]:
```
current_employee_yos_gender_hourly = df[df['pay_rate_type'] == 'Hourly'].
 ↪groupby(['years_of_service_grouped','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_employee_yos_gender_hourly)
```

[67]:
```
                                 count_nonzero  median
years_of_service_grouped gender
0                        Female          21.00   29.23
                         Male            21.00   22.05
1-2                      Female          36.00   31.92
                         Male            23.00   26.04
3-5                      Female           8.00   34.77
                         Male            15.00   22.98
6-10                     Female          13.00   30.84
                         Male            21.00   25.16
11-15                    Female          13.00   34.72
                         Male            11.00   29.92
16-20                    Female          17.00   25.08
                         Male            11.00   30.21
21-25                    Female          12.00   30.25
25+                      Female          17.00   27.69
```

[68]:
```
current_employee_yos_race = df.
    ↪groupby(['years_of_service_grouped','race_ethnicity']).
    ↪agg({'current_base_pay': [np.count_nonzero]})
suppress(current_employee_yos_race)
```

[68]:
```
count_nonzero
years_of_service_grouped race_ethnicity
0                        Asian (United States of America)
15.00
                         Black or African American (United States of Ame...
20.00
                         Hispanic or Latino (United States of America)
10.00
                         Prefer Not to Disclose (United States of America)
8.00
                         Two or More Races (United States of America)
6.00
                         White (United States of America)
77.00
1-2                      Asian (United States of America)
20.00
                         Black or African American (United States of Ame...
30.00
                         Hispanic or Latino (United States of America)
12.00
                         Two or More Races (United States of America)
6.00
                         White (United States of America)
146.00
3-5                      Asian (United States of America)
17.00
                         Black or African American (United States of Ame...
20.00
                         Hispanic or Latino (United States of America)
17.00
                         Two or More Races (United States of America)
6.00
                         White (United States of America)
127.00
6-10                     Asian (United States of America)
8.00
                         Black or African American (United States of Ame...
21.00
                         White (United States of America)
71.00
11-15                    Asian (United States of America)
5.00
```

```
                         Black or African American (United States of Ame...
15.00
                         White (United States of America)
57.00
16-20                    Asian (United States of America)
6.00
                         Black or African American (United States of Ame...
23.00
                         White (United States of America)
70.00
21-25                    Black or African American (United States of Ame...
13.00
                         White (United States of America)
28.00
25+                      Black or African American (United States of Ame...
15.00
                         White (United States of America)
36.00
```

[69]:
```
current_employee_yos_race_salary = df[df['pay_rate_type'] == 'Salaried'].
 ↪groupby(['years_of_service_grouped','race_ethnicity']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_employee_yos_race_salary)
```

[69]:
```
count_nonzero  \
years_of_service_grouped race_ethnicity
0                        Asian (United States of America)
11.00
                         Black or African American (United States of Ame...
5.00
                         Hispanic or Latino (United States of America)
5.00
                         White (United States of America)
65.00
1-2                      Asian (United States of America)
16.00
                         Black or African American (United States of Ame...
12.00
                         Hispanic or Latino (United States of America)
7.00
                         Two or More Races (United States of America)
5.00
                         White (United States of America)
115.00
3-5                      Asian (United States of America)
15.00
                         Black or African American (United States of Ame...
14.00
```

```
                         Hispanic or Latino (United States of America)
15.00
                         Two or More Races (United States of America)
5.00
                         White (United States of America)
116.00
6-10                     Asian (United States of America)
5.00
                         Black or African American (United States of Ame...
6.00
                         White (United States of America)
56.00
11-15                    Black or African American (United States of Ame...
7.00
                         White (United States of America)
43.00
16-20                    Black or African American (United States of Ame...
10.00
                         White (United States of America)
58.00
21-25                    White (United States of America)
23.00
25+                      White (United States of America)
29.00

median
years_of_service_grouped race_ethnicity
0                        Asian (United States of America)
77000.00
                         Black or African American (United States of Ame...
87000.00
                         Hispanic or Latino (United States of America)
75000.00
                         White (United States of America)
90000.00
1-2                      Asian (United States of America)
87780.00
                         Black or African American (United States of Ame...
89780.00
                         Hispanic or Latino (United States of America)
82000.00
                         Two or More Races (United States of America)
68000.00
                         White (United States of America)
92780.00
3-5                      Asian (United States of America)
92260.14
```

```
                              Black or African American (United States of Ame...
94662.48
                              Hispanic or Latino (United States of America)
81999.88
                              Two or More Races (United States of America)
83340.00
                              White (United States of America)
93279.21
6-10                          Asian (United States of America)
96944.47
                              Black or African American (United States of Ame...
89196.67
                              White (United States of America)
112925.50
11-15                         Black or African American (United States of Ame...
85000.00
                              White (United States of America)
106249.68
16-20                         Black or African American (United States of Ame...
104397.79
                              White (United States of America)
134697.89
21-25                         White (United States of America)
114803.00
25+                           White (United States of America)
134957.37
```

[70]:

```
current_employee_yos_race_hourly = df[df['pay_rate_type'] == 'Hourly'].
 ↪groupby(['years_of_service_grouped','race_ethnicity']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_employee_yos_race_hourly)
```

[70]:

```
count_nonzero  \
years_of_service_grouped race_ethnicity
0                        Black or African American (United States of Ame...
15.00
                         Hispanic or Latino (United States of America)
5.00
                         White (United States of America)
12.00
1-2                      Black or African American (United States of Ame...
18.00
                         Hispanic or Latino (United States of America)
5.00
                         White (United States of America)
31.00
3-5                      Black or African American (United States of Ame...
6.00
```

```
                        White (United States of America)
11.00
6-10                    Black or African American (United States of Ame...
15.00
                        White (United States of America)
15.00
11-15                   Black or African American (United States of Ame...
8.00
                        White (United States of America)
14.00
16-20                   Black or African American (United States of Ame...
13.00
                        White (United States of America)
12.00
21-25                   Black or African American (United States of Ame...
9.00
                        White (United States of America)
5.00
25+                     Black or African American (United States of Ame...
11.00
                        White (United States of America)
7.00

median
years_of_service_grouped race_ethnicity
0                       Black or African American (United States of Ame...
25.64
                        Hispanic or Latino (United States of America)
28.21
                        White (United States of America)
29.52
1-2                     Black or African American (United States of Ame...
25.75
                        Hispanic or Latino (United States of America)
21.85
                        White (United States of America)
33.46
3-5                     Black or African American (United States of Ame...
21.83
                        White (United States of America)
29.23
6-10                    Black or African American (United States of Ame...
24.38
                        White (United States of America)
31.92
11-15                   Black or African American (United States of Ame...
30.15
```

```
                         White (United States of America)
34.05
16-20                    Black or African American (United States of Ame...
23.99
                         White (United States of America)
34.87
21-25                    Black or African American (United States of Ame...
29.74
                         White (United States of America)
38.93
25+                      Black or African American (United States of Ame...
24.71
                         White (United States of America)
32.66
```

1.4.10 Employee performance evaluations

[71]:
```
fifteen = pd.concat([fifteen1,fifteen2])
fifteenrating_gender = fifteen.groupby(['gender'])['performance_rating'].
 ↪median().sort_values(ascending=False)
fifteenrating_gender
```

[71]:
```
gender
Male      3.40
Female    3.40
Name: performance_rating, dtype: float64
```

[72]:
```
sixteen = pd.concat([sixteen1,sixteen2])
sixteenrating_gender = sixteen.groupby(['gender'])['performance_rating'].
 ↪median().sort_values(ascending=False)
sixteenrating_gender
```

[72]:
```
gender
Male      3.30
Female    3.30
Name: performance_rating, dtype: float64
```

[73]:
```
seventeen = pd.concat([seventeen1,seventeen2])
seventeenrating_gender = seventeen.groupby(['gender'])['performance_rating'].
 ↪median().sort_values(ascending=False)
seventeenrating_gender
```

[73]:
```
gender
Male      3.40
Female    3.40
Name: performance_rating, dtype: float64
```

[74]:
```
eighteen = pd.concat([eighteen1,eighteen2])
```

```
eighteenrating_gender = eighteen.groupby(['gender'])['performance_rating'].
  ↪median().sort_values(ascending=False)
eighteenrating_gender
```

[74]:
```
gender
Male      3.40
Female    3.40
Name: performance_rating, dtype: float64
```

[75]:
```
fifteenrating_race_ethnicity = fifteen.
  ↪groupby(['race_ethnicity'])['performance_rating'].median().
  ↪sort_values(ascending=False)
fifteenrating_race_ethnicity
```

[75]:
```
race_ethnicity
American Indian or Alaska Native (United States of America)            3.50
White (United States of America)                                       3.40
Asian (United States of America)                                       3.40
Two or More Races (United States of America)                           3.30
Prefer Not to Disclose (United States of America)                      3.30
Native Hawaiian or Other Pacific Islander (United States of America)   3.25
Hispanic or Latino (United States of America)                          3.20
Black or African American (United States of America)                  3.20
Name: performance_rating, dtype: float64
```

[76]:
```
sixteenrating_race_ethnicity = sixteen.
  ↪groupby(['race_ethnicity'])['performance_rating'].median().
  ↪sort_values(ascending=False)
sixteenrating_race_ethnicity
```

[76]:
```
race_ethnicity
Native Hawaiian or Other Pacific Islander (United States of America)   3.70
White (United States of America)                                       3.40
Asian (United States of America)                                       3.35
Prefer Not to Disclose (United States of America)                      3.30
American Indian or Alaska Native (United States of America)            3.25
Two or More Races (United States of America)                           3.20
Black or African American (United States of America)                  3.20
Hispanic or Latino (United States of America)                          3.10
Name: performance_rating, dtype: float64
```

[77]:
```
seventeenrating_race_ethnicity = seventeen.
  ↪groupby(['race_ethnicity'])['performance_rating'].median().
  ↪sort_values(ascending=False)
seventeenrating_race_ethnicity
```

[77]:
```
race_ethnicity
American Indian or Alaska Native (United States of America)            3.55
Native Hawaiian or Other Pacific Islander (United States of America)   3.50
White (United States of America)                                       3.40
```

```
Prefer Not to Disclose (United States of America)                     3.40
Asian (United States of America)                                      3.40
Two or More Races (United States of America)                          3.30
Hispanic or Latino (United States of America)                         3.30
Black or African American (United States of America)                  3.20
Name: performance_rating, dtype: float64
```

[78]:
```
eighteenrating_race_ethnicity = eighteen.
 ↪groupby(['race_ethnicity'])['performance_rating'].median().
 ↪sort_values(ascending=False)
eighteenrating_race_ethnicity
```

[78]:
```
race_ethnicity
American Indian or Alaska Native (United States of America)           3.55
White (United States of America)                                      3.50
Native Hawaiian or Other Pacific Islander (United States of America)  3.40
Asian (United States of America)                                      3.40
Prefer Not to Disclose (United States of America)                     3.35
Two or More Races (United States of America)                          3.30
Hispanic or Latino (United States of America)                         3.30
Black or African American (United States of America)                  3.30
Name: performance_rating, dtype: float64
```

[79]:
```
fifteenrating_gender_race = fifteen.
 ↪groupby(['race_ethnicity','gender'])['performance_rating'].median().
 ↪sort_values(ascending=False)
fifteenrating_gender_race
```

[79]:
```
race_ethnicity                                                        gender
White (United States of America)                                      Male
3.50
Asian (United States of America)                                      Male
3.50
American Indian or Alaska Native (United States of America)           Female
3.50
White (United States of America)                                      Female
3.40
Asian (United States of America)                                      Female
3.40
American Indian or Alaska Native (United States of America)           Male
3.40
Two or More Races (United States of America)                          Female
3.30
Prefer Not to Disclose (United States of America)                     Female
3.30
Native Hawaiian or Other Pacific Islander (United States of America)  Male
3.30
Hispanic or Latino (United States of America)                         Female
3.30
```

```
Native Hawaiian or Other Pacific Islander (United States of America)  Female
3.20
Hispanic or Latino (United States of America)                         Male
3.20
Black or African American (United States of America)                 Female
3.20
                                                                      Male
3.00
Two or More Races (United States of America)                          Male
2.75
Prefer Not to Disclose (United States of America)                     Male
nan
Name: performance_rating, dtype: float64
```

[80]:
```
sixteenrating_gender_race = sixteen.
 ↪groupby(['race_ethnicity','gender'])['performance_rating'].median().
 ↪sort_values(ascending=False)
sixteenrating_gender_race
```

[80]:
```
race_ethnicity                                                        gender
Native Hawaiian or Other Pacific Islander (United States of America)  Female
4.10
White (United States of America)                                      Male
3.40
                                                                      Female
3.40
Asian (United States of America)                                      Female
3.40
Prefer Not to Disclose (United States of America)                     Female
3.30
Native Hawaiian or Other Pacific Islander (United States of America)  Male
3.30
Asian (United States of America)                                      Male
3.30
American Indian or Alaska Native (United States of America)           Female
3.30
Black or African American (United States of America)                  Female
3.25
Two or More Races (United States of America)                          Female
3.20
American Indian or Alaska Native (United States of America)           Male
3.20
Hispanic or Latino (United States of America)                         Female
3.15
Black or African American (United States of America)                  Male
3.15
Hispanic or Latino (United States of America)                         Male
3.10
```

```
Two or More Races (United States of America)                          Male
2.70
Prefer Not to Disclose (United States of America)                     Male
nan
Name: performance_rating, dtype: float64
```

[81]:
```
seventeenrating_gender_race = seventeen.
 ↪groupby(['race_ethnicity','gender'])['performance_rating'].median().
 ↪sort_values(ascending=False)
seventeenrating_gender_race
```

[81]:
```
race_ethnicity                                                        gender
Native Hawaiian or Other Pacific Islander (United States of America)  Female
4.00
American Indian or Alaska Native (United States of America)           Female
3.70
Two or More Races (United States of America)                          Male
3.50
Prefer Not to Disclose (United States of America)                     Female
3.50
White (United States of America)                                      Male
3.40
                                                                      Female
3.40
Asian (United States of America)                                      Female
3.40
Hispanic or Latino (United States of America)                         Male
3.30
                                                                      Female
3.30
Asian (United States of America)                                      Male
3.30
Two or More Races (United States of America)                          Female
3.25
Prefer Not to Disclose (United States of America)                     Male
3.20
Black or African American (United States of America)                  Female
3.20
                                                                      Male
3.10
American Indian or Alaska Native (United States of America)           Male
3.10
Native Hawaiian or Other Pacific Islander (United States of America)  Male
3.00
Name: performance_rating, dtype: float64
```

[82]:
```
```

```
eighteenrating_gender_race = eighteen.
 ↪groupby(['race_ethnicity','gender'])['performance_rating'].median().
 ↪sort_values(ascending=False)
eighteenrating_gender_race
```

[82]:
```
race_ethnicity                                                     gender
American Indian or Alaska Native (United States of America)       Female
3.70
Prefer Not to Disclose (United States of America)                 Female
3.55
White (United States of America)                                  Male
3.50
                                                                   Female
3.40
Native Hawaiian or Other Pacific Islander (United States of America)  Male
3.40
Asian (United States of America)                                  Male
3.40
                                                                   Female
3.40
Two or More Races (United States of America)                      Male
3.35
                                                                   Female
3.30
Prefer Not to Disclose (United States of America)                 Male
3.30
Hispanic or Latino (United States of America)                     Male
3.30
                                                                   Female
3.30
Black or African American (United States of America)              Male
3.30
                                                                   Female
3.30
American Indian or Alaska Native (United States of America)       Male
3.20
Native Hawaiian or Other Pacific Islander (United States of America)  Female
nan
Name: performance_rating, dtype: float64
```

1.4.11 Employee pay changes

[83]:
```
reason_for_change = reason_for_change_combined.
 ↪groupby(['business_process_reason']).agg({'business_process_reason': [np.
 ↪count_nonzero]})
suppress_count(reason_for_change)
```

[83]:
```
                                               count_nonzero
business_process_reason
Request Compensation Change > Adjustment > Cont...       2451
Merit > Performance > Annual Performance Appraisal       1729
Data Change > Data Change > Change Job Details            673
Transfer > Transfer > Move to another Manager             533
Request Compensation Change > Adjustment > Chan...        435
Request Compensation Change > Adjustment > Mark...        384
Promotion > Promotion > Promotion                         359
Hire Employee > New Hire > Fill Vacancy                   253
Hire Employee > New Hire > New Position                   189
Request Compensation Change > Adjustment > Incr...         72
Request Compensation Change > Adjustment > Job ...         60
Transfer > Transfer > Transfer between departments         54
Request Compensation Change > Adjustment > Perf...         38
Transfer > Transfer > Transfer between companies           21
Hire Employee > Rehire > Fill Vacancy                      16
Hire Employee > New Hire > Convert Contingent              12
Hire Employee > New Hire > Conversion                      11
Hire Employee > Rehire > New Position                       7
```

[84]:
```
reason_for_change_gender = reason_for_change_combined.
 ↪groupby(['business_process_reason','gender']).agg({'business_process_reason':
 ↪ [np.count_nonzero]})
suppress_count(reason_for_change_gender)
```

[84]:
```
                                                          count_nonzero
business_process_reason                            gender
Request Compensation Change > Adjustment > Cont... Female          1284
                                                   Male            1167
Merit > Performance > Annual Performance Appraisal Female           878
                                                   Male             851
Data Change > Data Change > Change Job Details     Female           367
                                                   Male             306
Transfer > Transfer > Move to another Manager      Male             299
Request Compensation Change > Adjustment > Chan... Female           288
Transfer > Transfer > Move to another Manager      Female           234
Request Compensation Change > Adjustment > Mark... Female           233
Promotion > Promotion > Promotion                  Female           228
Request Compensation Change > Adjustment > Mark... Male             151
Request Compensation Change > Adjustment > Chan... Male             147
Hire Employee > New Hire > Fill Vacancy            Female           140
Promotion > Promotion > Promotion                  Male             131
Hire Employee > New Hire > Fill Vacancy            Male             113
Hire Employee > New Hire > New Position            Female           109
                                                   Male              80
Request Compensation Change > Adjustment > Incr... Male              41
Request Compensation Change > Adjustment > Job ... Female            33
```

```
Request Compensation Change > Adjustment > Incr... Female             31
Transfer > Transfer > Transfer between departments Female             30
Request Compensation Change > Adjustment > Job ... Male               27
Transfer > Transfer > Transfer between departments Male               24
Request Compensation Change > Adjustment > Perf... Male               21
Transfer > Transfer > Transfer between companies   Female             21
Request Compensation Change > Adjustment > Perf... Female             17
Hire Employee > Rehire > Fill Vacancy              Female              9
Hire Employee > New Hire > Convert Contingent      Female              8
Hire Employee > New Hire > Conversion              Female              7
Hire Employee > Rehire > Fill Vacancy              Male                7
Hire Employee > Rehire > New Position              Female              6
```

[85]:
```
reason_for_change_race = reason_for_change_combined.
 ↪groupby(['business_process_reason','race_ethnicity']).
 ↪agg({'business_process_reason': [np.count_nonzero]})
suppress_count(reason_for_change_race)
```

[85]:
```
                       count_nonzero
business_process_reason                            race_ethnicity
Request Compensation Change > Adjustment > Cont... White (United States of
America)                                     1556
Merit > Performance > Annual Performance Appraisal White (United States of
America)                                     1109
Request Compensation Change > Adjustment > Cont... Black or African American
(United States of Ame...                    508
Data Change > Data Change > Change Job Details     White (United States of
America)                                      432
Merit > Performance > Annual Performance Appraisal Black or African American
(United States of Ame...                    347
Transfer > Transfer > Move to another Manager      White (United States of
America)                                      288
Request Compensation Change > Adjustment > Chan... White (United States of
America)                                      266
Request Compensation Change > Adjustment > Mark... White (United States of
America)                                      255
Promotion > Promotion > Promotion                  White (United States of
America)                                      213
Request Compensation Change > Adjustment > Cont... Asian (United States of
America)                                      195
Transfer > Transfer > Move to another Manager      Black or African American
(United States of Ame...                    168
Merit > Performance > Annual Performance Appraisal Asian (United States of
America)                                      142
Hire Employee > New Hire > Fill Vacancy            White (United States of
America)                                      133
Hire Employee > New Hire > New Position            White (United States of
America)                                      122
```

```
Request Compensation Change > Adjustment > Cont... Hispanic or Latino (United
States of America)                  97
Request Compensation Change > Adjustment > Chan... Black or African American
(United States of Ame...            85
Data Change > Data Change > Change Job Details     Black or African American
(United States of Ame...            83
                                                   Asian (United States of
America)                               76
Promotion > Promotion > Promotion                  Black or African American
(United States of Ame...            74
Merit > Performance > Annual Performance Appraisal Hispanic or Latino (United
States of America)                  65
Hire Employee > New Hire > Fill Vacancy            Black or African American
(United States of Ame...            59
Request Compensation Change > Adjustment > Incr... White (United States of
America)                               55
Request Compensation Change > Adjustment > Mark... Black or African American
(United States of Ame...            43
Transfer > Transfer > Transfer between departments White (United States of
America)                               40
Request Compensation Change > Adjustment > Mark... Asian (United States of
America)                               39
Request Compensation Change > Adjustment > Job ... White (United States of
America)                               39
Data Change > Data Change > Change Job Details     Hispanic or Latino (United
States of America)                  35
Promotion > Promotion > Promotion                  Asian (United States of
America)                               34
Transfer > Transfer > Move to another Manager      Asian (United States of
America)                               33
Request Compensation Change > Adjustment > Chan... Asian (United States of
America)                               30
...
...
Hire Employee > New Hire > Fill Vacancy            Hispanic or Latino (United
States of America)                  18
Promotion > Promotion > Promotion                  Hispanic or Latino (United
States of America)                  17
Request Compensation Change > Adjustment > Chan... Hispanic or Latino (United
States of America)                  16
Transfer > Transfer > Transfer between companies   White (United States of
America)                               12
Merit > Performance > Annual Performance Appraisal Two or More Races (United
States of America)                  12
Request Compensation Change > Adjustment > Cont... American Indian or Alaska
Native (United States...            11
Hire Employee > New Hire > Fill Vacancy            Prefer Not to Disclose
```

```
(United States of America)              11
Promotion > Promotion > Promotion                  Two or More Races (United
States of America)                    9
Hire Employee > New Hire > Fill Vacancy            Two or More Races (United
States of America)                    9
Request Compensation Change > Adjustment > Perf... Black or African American
(United States of Ame...              8
Hire Employee > New Hire > Conversion              White (United States of
America)                                8
Request Compensation Change > Adjustment > Mark... Two or More Races (United
States of America)                    8
Merit > Performance > Annual Performance Appraisal American Indian or Alaska
Native (United States...              8
Request Compensation Change > Adjustment > Job ... Asian (United States of
America)                                8
Merit > Performance > Annual Performance Appraisal Prefer Not to Disclose
(United States of America)               8
Request Compensation Change > Adjustment > Cont... Prefer Not to Disclose
(United States of America)               8
Hire Employee > New Hire > Convert Contingent      White (United States of
America)                                7
Request Compensation Change > Adjustment > Chan... Prefer Not to Disclose
(United States of America)               7
Hire Employee > New Hire > New Position            Hispanic or Latino (United
States of America)                   7
Request Compensation Change > Adjustment > Incr... Black or African American
(United States of Ame...              7
Hire Employee > New Hire > New Position            Two or More Races (United
States of America)                    7
Hire Employee > Rehire > Fill Vacancy              White (United States of
America)                                7
Request Compensation Change > Adjustment > Cont... Native Hawaiian or Other
Pacific Islander (Unit...              6
Transfer > Transfer > Transfer between departments Black or African American
(United States of Ame...              6
                                                   Asian (United States of
America)                                6
Hire Employee > Rehire > Fill Vacancy              Black or African American
(United States of Ame...              6
Transfer > Transfer > Transfer between companies   Prefer Not to Disclose
(United States of America)               6
Data Change > Data Change > Change Job Details     Two or More Races (United
States of America)                    6
Request Compensation Change > Adjustment > Job ... Black or African American
(United States of Ame...              6
Hire Employee > New Hire > New Position            Prefer Not to Disclose
(United States of America)               5
```

```
[67 rows x 1 columns]
```

[86]:
```
reason_for_change_race_gender = reason_for_change_combined.
 ↪groupby(['business_process_reason','race_ethnicity','gender']).
 ↪agg({'business_process_reason': [np.count_nonzero]})
suppress_count(reason_for_change_race_gender)
```

[86]:
```
                              count_nonzero
business_process_reason                                 race_ethnicity
gender
Request Compensation Change > Adjustment > Cont... White (United States of
America)                    Female                  794
                      Male                  762
Merit > Performance > Annual Performance Appraisal White (United States of
America)                    Male                    564
                      Female                545
Request Compensation Change > Adjustment > Cont... Black or African American
(United States of Ame... Female                 275
                      Male                  233
Data Change > Data Change > Change Job Details     White (United States of
America)                    Female                  225
                      Male                  207
Merit > Performance > Annual Performance Appraisal Black or African American
(United States of Ame... Female                 183
Request Compensation Change > Adjustment > Chan... White (United States of
America)                    Female                  178
Merit > Performance > Annual Performance Appraisal Black or African American
(United States of Ame... Male                   164
Transfer > Transfer > Move to another Manager      White (United States of
America)                    Male                    153
Request Compensation Change > Adjustment > Mark... White (United States of
America)                    Female                  146
Promotion > Promotion > Promotion                  White (United States of
America)                    Female                  137
Transfer > Transfer > Move to another Manager      White (United States of
America)                    Female                  135
Request Compensation Change > Adjustment > Cont... Asian (United States of
America)                    Female                  120
Request Compensation Change > Adjustment > Mark... White (United States of
America)                    Male                    109
Transfer > Transfer > Move to another Manager      Black or African American
(United States of Ame... Male                    92
Request Compensation Change > Adjustment > Chan... White (United States of
America)                    Male                     88
Merit > Performance > Annual Performance Appraisal Asian (United States of
America)                    Female                   86
Transfer > Transfer > Move to another Manager      Black or African American
```

```
(United States of Ame... Female            76
Promotion > Promotion > Promotion                 White (United States of
America)                   Male              76
Request Compensation Change > Adjustment > Cont... Asian (United States of
America)                   Male              75
Hire Employee > New Hire > Fill Vacancy           White (United States of
America)                   Female            74
Hire Employee > New Hire > New Position           White (United States of
America)                   Female            67
Hire Employee > New Hire > Fill Vacancy           White (United States of
America)                   Male              59
Request Compensation Change > Adjustment > Chan... Black or African American
(United States of Ame... Female            58
Data Change > Data Change > Change Job Details     Black or African American
(United States of Ame... Female            57
Merit > Performance > Annual Performance Appraisal Asian (United States of
America)                   Male              56
Hire Employee > New Hire > New Position           White (United States of
America)                   Male              55
...
...
Hire Employee > New Hire > Fill Vacancy           Hispanic or Latino (United
States of America)      Female            13
Transfer > Transfer > Transfer between companies   White (United States of
America)                   Female            12
Hire Employee > New Hire > New Position           Black or African American
(United States of Ame... Male              12
Request Compensation Change > Adjustment > Mark... Hispanic or Latino (United
States of America)      Male              12
Request Compensation Change > Adjustment > Perf... White (United States of
America)                   Female            11
Request Compensation Change > Adjustment > Chan... Asian (United States of
America)                   Male              11
Hire Employee > New Hire > New Position           Black or African American
(United States of Ame... Female            11
Request Compensation Change > Adjustment > Mark... Hispanic or Latino (United
States of America)      Female            10
Promotion > Promotion > Promotion                 Two or More Races (United
States of America)       Female             9
Merit > Performance > Annual Performance Appraisal Two or More Races (United
States of America)       Female             9
Request Compensation Change > Adjustment > Cont... American Indian or Alaska
Native (United States... Female             9
Request Compensation Change > Adjustment > Mark... Asian (United States of
America)                   Male               9
Request Compensation Change > Adjustment > Cont... Two or More Races (United
States of America)       Male               8
```

```
Request Compensation Change > Adjustment > Chan... Hispanic or Latino (United
States of America)      Male                8
Transfer > Transfer > Move to another Manager      Asian (United States of
America)                   Female                8
Request Compensation Change > Adjustment > Chan... Hispanic or Latino (United
States of America)      Female              8
Request Compensation Change > Adjustment > Mark... Two or More Races (United
States of America)       Female              7
Transfer > Transfer > Move to another Manager      Hispanic or Latino (United
States of America)      Female              7
Merit > Performance > Annual Performance Appraisal American Indian or Alaska
Native (United States... Female              7
Request Compensation Change > Adjustment > Chan... Prefer Not to Disclose
(United States of America)  Female                6
Hire Employee > New Hire > Fill Vacancy            Two or More Races (United
States of America)       Male                6
Transfer > Transfer > Transfer between companies   Prefer Not to Disclose
(United States of America)  Female                6
Hire Employee > New Hire > Fill Vacancy            Prefer Not to Disclose
(United States of America)  Female                6
Transfer > Transfer > Transfer between departments Asian (United States of
America)                   Male                6
Merit > Performance > Annual Performance Appraisal Prefer Not to Disclose
(United States of America)  Female                6
Request Compensation Change > Adjustment > Perf... Black or African American
(United States of Ame... Male                5
Hire Employee > New Hire > Conversion              White (United States of
America)                   Female                5
Hire Employee > New Hire > Fill Vacancy            Asian (United States of
America)                   Male                5
                                                   Prefer Not to Disclose

(United States of America)  Male                5
                                                   Hispanic or Latino (United

States of America)      Male                5

[93 rows x 1 columns]
```

1.5 News

1.5.1 Gender

[87]:
```python
current_news_gender_salaried = news_salaried.groupby(['gender']).
 ↪agg({'current_base_pay': [np.count_nonzero]})
suppress(current_news_gender_salaried)
```

[87]:
```
        count_nonzero
gender
```

```
Female          284.00
Male            290.00
```

[88]:
```
current_news_gender_hourly = news_hourly.groupby(['gender']).
 ↪agg({'current_base_pay': [np.count_nonzero]})
suppress(current_news_gender_hourly)
```

[88]:
```
        count_nonzero
gender
Female          63.00
Male            33.00
```

[89]:
```
current_news_gender_salaried_median = news_salaried.groupby(['gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_gender_salaried_median)
```

[89]:
```
        count_nonzero    median
gender
Female         284.00  95595.02
Male           290.00 116064.57
```

[90]:
```
current_news_gender_hourly_median = news_hourly.groupby(['gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_gender_hourly_median)
```

[90]:
```
        count_nonzero  median
gender
Female          63.00   32.75
Male            33.00   33.33
```

[91]:
```
current_news_gender_age_salaried = news_salaried.groupby(['gender'])['age'].
 ↪median().sort_values(ascending=False)
current_news_gender_age_salaried
```

[91]:
```
gender
Male      41.00
Female    35.00
Name: age, dtype: float64
```

[92]:
```
current_news_gender_age_hourly = news_hourly.groupby(['gender'])['age'].
 ↪median().sort_values(ascending=False)
current_news_gender_age_hourly
```

[92]:
```
gender
Male      36.00
Female    31.00
Name: age, dtype: float64
```

[93]:
```
current_news_gender_age_5_salary = news_salaried.
 ↪groupby(['age_group_5','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_gender_age_5_salary)
```

[93]:

```
                         count_nonzero    median
age_group_5 gender
<25         Female               19.00  64280.00
            Male                  5.00  72000.00
25-29       Female               60.00  80000.00
            Male                 31.00  85500.00
30-34       Female               57.00  87000.00
            Male                 46.00  97827.86
35-39       Female               38.00  98891.57
            Male                 48.00 116030.00
40-44       Female               22.00 133200.02
            Male                 41.00 125000.00
45-49       Female               20.00 117294.59
            Male                 23.00  99725.00
50-54       Female               29.00 108864.49
            Male                 41.00 126280.47
55-59       Female               22.00 145654.99
            Male                 29.00 147780.00
60-64       Female               12.00 129324.85
            Male                 16.00 131216.77
65+         Female                5.00 157095.42
            Male                 10.00 156259.68
```

[94]:

```
current_news_gender_age_5_hourly = news_hourly.
 ↪groupby(['age_group_5','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_gender_age_5_hourly)
```

[94]:

```
                         count_nonzero  median
age_group_5 gender
<25         Female               12.00   31.38
25-29       Female               17.00   31.17
            Male                  6.00   20.96
30-34       Male                  7.00   33.73
35-39       Female                5.00   31.92
40-44       Female                5.00   41.43
45-49       Female                6.00   48.55
50-54       Female                5.00   38.93
55-59       Male                  5.00   34.89
```

[95]:

```
current_news_gender_age_10_salary = news_salaried.
 ↪groupby(['age_group_10','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_gender_age_10_salary)
```

[95]:

```
                          count_nonzero    median
age_group_10 gender
<25          Female               19.00  64280.00
             Male                  5.00  72000.00
```

```
25-34          Female          117.00  83146.67
               Male             77.00  92500.00
35-44          Female           60.00 105691.31
               Male             89.00 118785.00
45-54          Female           49.00 108864.49
               Male             64.00 117981.79
55-64          Female           34.00 140423.62
               Male             45.00 146541.57
65+            Female            5.00 157095.42
               Male             10.00 156259.68
```

[96]:
```
current_news_gender_age_10_hourly = news_hourly.
 ↪groupby(['age_group_10','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_gender_age_10_hourly)
```

[96]:
```
                          count_nonzero  median
age_group_10 gender
<25          Female               12.00   31.38
25-34        Female               21.00   31.17
             Male                 13.00   30.77
35-44        Female               10.00   33.12
             Male                  7.00   35.90
45-54        Female               11.00   41.38
55-64        Female                5.00   42.14
             Male                  7.00   33.41
```

[97]:
```
current_news_gender_salaried_under_40 = news_salaried[news_salaried['age'] <␣
 ↪40].groupby(['gender']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress(current_news_gender_salaried_under_40)
```

[97]:
```
        count_nonzero   median
gender
Female         174.00 84030.00
Male           130.00 95890.00
```

[98]:
```
current_news_gender_salaried_over_40 = news_salaried[news_salaried['age'] > 39].
 ↪groupby(['gender']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_gender_salaried_over_40)
```

[98]:
```
        count_nonzero    median
gender
Female         110.00 126000.00
Male           160.00 127764.51
```

[99]:
```
current_news_gender_hourly_under_40 = news_hourly[news_hourly['age'] < 40].
 ↪groupby(['gender']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_gender_hourly_under_40)
```

[99]:
```
        count_nonzero  median
gender
Female          38.00   31.43
Male            18.00   32.05
```

[100]:
```
current_news_gender_hourly_over_40 = news_hourly[news_hourly['age'] > 39].
↪groupby(['gender']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_gender_hourly_over_40)
```

[100]:
```
        count_nonzero  median
gender
Female          25.00   41.43
Male            15.00   33.38
```

1.5.2 Race and ethnicity

[101]:
```
current_news_race_salaried = news_salaried.groupby(['race_ethnicity']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_news_race_salaried)
```

[101]:
```
                                                    count_nonzero
race_ethnicity
White (United States of America)                           406.00
Black or African American (United States of Ame...          48.00
Asian (United States of America)                            46.00
Hispanic or Latino (United States of America)               28.00
Two or More Races (United States of America)                14.00
Prefer Not to Disclose (United States of America)            8.00
```

[102]:
```
current_news_race_hourly = news_hourly.groupby(['race_ethnicity']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_news_race_hourly)
```

[102]:
```
                                                    count_nonzero
race_ethnicity
White (United States of America)                            64.00
Black or African American (United States of Ame...          13.00
Asian (United States of America)                            11.00
```

[103]:
```
current_news_race_group_salaried = news_salaried.groupby(['race_grouping']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_news_race_group_salaried)
```

[103]:
```
                  count_nonzero
race_grouping
white                    406.00
person of color          139.00
unknown                   29.00
```

[104]:
```
current_news_race_group_hourly = news_hourly.groupby(['race_grouping']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_news_race_group_hourly)
```

[104]:
```
                  count_nonzero
race_grouping
white                     64.00
person of color           30.00
```

[105]:
```
current_news_race_median_salaried = news_salaried.groupby(['race_ethnicity']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_race_median_salaried)
```

[105]:
```
                                                     count_nonzero    median
race_ethnicity
White (United States of America)                            406.00 106212.10
Black or African American (United States of Ame...           48.00  97276.46
Asian (United States of America)                             46.00  95205.02
Hispanic or Latino (United States of America)                28.00  82890.00
Prefer Not to Disclose (United States of America)             8.00  82140.00
Two or More Races (United States of America)                 14.00  79860.00
```

[106]:
```
current_news_race_median_hourly = news_hourly.groupby(['race_ethnicity']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_race_median_hourly)
```

[106]:
```
                                                     count_nonzero  median
race_ethnicity
White (United States of America)                             64.00   33.59
Asian (United States of America)                             11.00   31.68
Black or African American (United States of Ame...           13.00   29.37
```

[107]:
```
current_news_race_group_median_salaried = news_salaried.
↪groupby(['race_grouping']).agg({'current_base_pay': [np.count_nonzero, np.
↪median]})
suppress_median(current_news_race_group_median_salaried)
```

[107]:
```
                  count_nonzero    median
race_grouping
unknown                   29.00 134780.00
white                    406.00 106212.10
person of color          139.00  92080.00
```

[108]:
```
current_news_race_group_median_hourly = news_hourly.groupby(['race_grouping']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_race_group_median_hourly)
```

[108]:
```
                  count_nonzero  median
race_grouping
white                     64.00   33.59
person of color           30.00   30.07
```

[109]:
```
current_news_race_age_salaried = news_salaried.
↪groupby(['race_ethnicity'])['age'].median().sort_values(ascending=False)
current_news_race_age_salaried
```

[109]:
```
race_ethnicity
American Indian or Alaska Native (United States of America)          49.50
Native Hawaiian or Other Pacific Islander (United States of America)   43.00
White (United States of America)                                     40.00
Black or African American (United States of America)                39.50
Hispanic or Latino (United States of America)                        37.00
Asian (United States of America)                                     33.00
Prefer Not to Disclose (United States of America)                    30.50
Two or More Races (United States of America)                         28.00
Name: age, dtype: float64
```

[110]:
```
current_news_race_age_hourly = news_hourly.groupby(['race_ethnicity'])['age'].
↪median().sort_values(ascending=False)
current_news_race_age_hourly
```

[110]:
```
race_ethnicity
American Indian or Alaska Native (United States of America)   69.00
White (United States of America)                              39.50
Asian (United States of America)                              36.00
Black or African American (United States of America)          28.00
Hispanic or Latino (United States of America)                 26.00
Prefer Not to Disclose (United States of America)             23.00
Two or More Races (United States of America)                  22.50
Name: age, dtype: float64
```

[111]:
```
current_news_race_age_5_salary = news_salaried.
↪groupby(['age_group_5','race_ethnicity']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_news_race_age_5_salary)
```

[111]:
```
                                                                  count_nonzero  \
age_group_5 race_ethnicity
<25         Asian (United States of America)                               5.00
            White (United States of America)                              12.00
25-29       Asian (United States of America)                              11.00
            Black or African American (United States of Ame...             6.00
            Two or More Races (United States of America)                   6.00
            White (United States of America)                              59.00
30-34       Asian (United States of America)                              10.00
            Black or African American (United States of Ame...             9.00
            Hispanic or Latino (United States of America)                  6.00
            White (United States of America)                              66.00
35-39       Asian (United States of America)                               7.00
            Black or African American (United States of Ame...             7.00
            Hispanic or Latino (United States of America)                  7.00
```

```
              White (United States of America)                              61.00
40-44         Black or African American (United States of Ame...             6.00
              White (United States of America)                              43.00
45-49         White (United States of America)                              36.00
50-54         Asian (United States of America)                               5.00
              Black or African American (United States of Ame...            10.00
              Hispanic or Latino (United States of America)                  5.00
              White (United States of America)                              48.00
55-59         White (United States of America)                              43.00
60-64         White (United States of America)                              25.00
65+           White (United States of America)                              13.00

                                                                    median
age_group_5 race_ethnicity
<25           Asian (United States of America)                    65780.00
              White (United States of America)                    65140.00
25-29         Asian (United States of America)                    77000.00
              Black or African American (United States of Ame...  81000.00
              Two or More Races (United States of America)        75690.00
              White (United States of America)                    81756.58
30-34         Asian (United States of America)                    95780.00
              Black or African American (United States of Ame...  88132.61
              Hispanic or Latino (United States of America)       80596.26
              White (United States of America)                    92640.00
35-39         Asian (United States of America)                   115000.00
              Black or African American (United States of Ame...  96147.48
              Hispanic or Latino (United States of America)       79618.25
              White (United States of America)                   105780.00
40-44         Black or African American (United States of Ame... 122610.00
              White (United States of America)                   126080.00
45-49         White (United States of America)                   104522.64
50-54         Asian (United States of America)                   103150.00
              Black or African American (United States of Ame... 106932.24
              Hispanic or Latino (United States of America)      126764.81
              White (United States of America)                   120481.79
55-59         White (United States of America)                   147780.00
60-64         White (United States of America)                   122780.00
65+           White (United States of America)                   159300.00
```

[112]:

```
current_news_race_age_5_hourly = news_hourly.
 ↪groupby(['age_group_5','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_race_age_5_hourly)
```

[112]:

```
                                                              count_nonzero  \
age_group_5 race_ethnicity
<25           White (United States of America)                          7.00
25-29         Black or African American (United States of Ame...         8.00
```

```
             White (United States of America)                              11.00
30-34        White (United States of America)                               9.00
35-39        White (United States of America)                               5.00
40-44        White (United States of America)                               7.00
45-49        White (United States of America)                               6.00
50-54        White (United States of America)                               5.00
55-59        White (United States of America)                               6.00
60-64        White (United States of America)                               5.00

                                                                   median
age_group_5 race_ethnicity
<25          White (United States of America)                        18.50
25-29        Black or African American (United States of Ame...      30.15
             White (United States of America)                        30.77
30-34        White (United States of America)                        33.73
35-39        White (United States of America)                        34.72
40-44        White (United States of America)                        41.43
45-49        White (United States of America)                        48.55
50-54        White (United States of America)                        38.93
55-59        White (United States of America)                        33.93
60-64        White (United States of America)                        38.82
```

[113]:
```
current_news_race_age_10_salary = news_salaried.
 ↪groupby(['age_group_10','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_race_age_10_salary)
```

[113]:
```
                                                                  count_nonzero
\
age_group_10 race_ethnicity
<25           Asian (United States of America)                              5.00
              White (United States of America)                             12.00
25-34         Asian (United States of America)                             21.00
              Black or African American (United States of Ame...           15.00
              Hispanic or Latino (United States of America)                10.00
              Prefer Not to Disclose (United States of America)             5.00
              Two or More Races (United States of America)                  9.00
              White (United States of America)                            125.00
35-44         Asian (United States of America)                             11.00
              Black or African American (United States of Ame...           13.00
              Hispanic or Latino (United States of America)                10.00
              White (United States of America)                            104.00
45-54         Asian (United States of America)                              7.00
              Black or African American (United States of Ame...           12.00
              Hispanic or Latino (United States of America)                 6.00
              White (United States of America)                             84.00
55-64         Black or African American (United States of Ame...            5.00
              White (United States of America)                             68.00
```

```
65+          White (United States of America)                          13.00

                                                                 median
age_group_10 race_ethnicity
<25          Asian (United States of America)                  65780.00
             White (United States of America)                  65140.00
25-34        Asian (United States of America)                  86000.00
             Black or African American (United States of Ame...  87000.00
             Hispanic or Latino (United States of America)     81249.94
             Prefer Not to Disclose (United States of America)  78500.00
             Two or More Races (United States of America)      76380.00
             White (United States of America)                  86000.00
35-44        Asian (United States of America)                 108324.02
             Black or African American (United States of Ame... 118530.00
             Hispanic or Latino (United States of America)     90390.04
             White (United States of America)                 115258.47
45-54        Asian (United States of America)                 111761.01
             Black or African American (United States of Ame... 102465.54
             Hispanic or Latino (United States of America)    126672.40
             White (United States of America)                 116687.17
55-64        Black or African American (United States of Ame... 123541.95
             White (United States of America)                 140051.84
65+          White (United States of America)                 159300.00
```

[114]:
```
current_news_race_age_10_hourly = news_hourly.
 ↪groupby(['age_group_10','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_race_age_10_hourly)
```

[114]:
```
                                                              count_nonzero
\
age_group_10 race_ethnicity
<25          White (United States of America)                          7.00
25-34        Black or African American (United States of Ame...        8.00
             White (United States of America)                         20.00
35-44        White (United States of America)                         12.00
45-54        White (United States of America)                         11.00
55-64        White (United States of America)                         11.00

                                                             median
age_group_10 race_ethnicity
<25          White (United States of America)                 18.50
25-34        Black or African American (United States of Ame...  30.15
             White (United States of America)                 31.26
35-44        White (United States of America)                 35.31
45-54        White (United States of America)                 41.38
55-64        White (United States of America)                 34.89
```

[115]:
```
current_news_race_group_age_5_salary = news_salaried.
↪groupby(['age_group_5','race_grouping']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_news_race_group_age_5_salary)
```

[115]:

age_group_5	race_grouping	count_nonzero	median
<25	person of color	11.00	63780.00
	white	12.00	65140.00
25-29	person of color	27.00	80000.00
	unknown	5.00	88280.00
	white	59.00	81756.58
30-34	person of color	28.00	86982.54
	unknown	9.00	108000.00
	white	66.00	92640.00
35-39	person of color	23.00	99238.50
	white	61.00	105780.00
40-44	person of color	15.00	108324.02
	unknown	5.00	145500.00
	white	43.00	126080.00
45-49	person of color	6.00	84937.50
	white	36.00	104522.64
50-54	person of color	20.00	109396.39
	white	48.00	120481.79
55-59	person of color	6.00	131686.62
	white	43.00	147780.00
60-64	white	25.00	122780.00
65+	white	13.00	159300.00

[116]:
```
current_news_race_group_age_5_hourly = news_hourly.
↪groupby(['age_group_5','race_grouping']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_news_race_group_age_5_hourly)
```

[116]:

age_group_5	race_grouping	count_nonzero	median
<25	person of color	6.00	29.49
	white	7.00	18.50
25-29	person of color	12.00	27.07
	white	11.00	30.77
30-34	white	9.00	33.73
35-39	white	5.00	34.72
40-44	white	7.00	41.43
45-49	white	6.00	48.55
50-54	white	5.00	38.93
55-59	white	6.00	33.93
60-64	white	5.00	38.82

[117]:
```
current_news_race_group_age_10_salary = news_salaried.
    groupby(['age_group_10','race_grouping']).agg({'current_base_pay': [np.
    count_nonzero, np.median]})
suppress(current_news_race_group_age_10_salary)
```

[117]:
```
                               count_nonzero    median
age_group_10 race_grouping
<25          person of color           11.00  63780.00
             white                     12.00  65140.00
25-34        person of color           55.00  83340.00
             unknown                   14.00 106890.00
             white                    125.00  86000.00
35-44        person of color           38.00 102890.00
             unknown                    7.00 140280.00
             white                    104.00 115258.47
45-54        person of color           26.00 106932.24
             white                     84.00 116687.17
55-64        person of color            8.00 140423.62
             white                     68.00 140051.84
65+          white                     13.00 159300.00
```

[118]:
```
current_news_race_group_age_10_hourly = news_hourly.
    groupby(['age_group_10','race_grouping']).agg({'current_base_pay': [np.
    count_nonzero, np.median]})
suppress(current_news_race_group_age_10_hourly)
```

[118]:
```
                               count_nonzero  median
age_group_10 race_grouping
<25          person of color            6.00   29.49
             white                      7.00   18.50
25-34        person of color           13.00   29.12
             white                     20.00   31.26
35-44        person of color            5.00   23.93
             white                     12.00   35.31
45-54        white                     11.00   41.38
55-64        white                     11.00   34.89
```

[119]:
```
current_news_race_under_40_salaried = news_salaried[news_salaried['age'] < 40].
    groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
    median]})
suppress_median(current_news_race_under_40_salaried)
```

[119]:
```
                                                      count_nonzero   median
race_ethnicity
White (United States of America)                             198.00 90780.00
Black or African American (United States of Ame...            24.00 87970.47
Asian (United States of America)                              33.00 87000.00
Hispanic or Latino (United States of America)                 19.00 79618.25
Prefer Not to Disclose (United States of America)              6.00 77750.00
```

```
Two or More Races (United States of America)                13.00 76380.00
```

[120]:
```
current_news_race_over_40_salaried = news_salaried[news_salaried['age'] > 39].
↪groupby(['race_grouping']).agg({'current_base_pay': [np.count_nonzero, np.
↪median]})
suppress_median(current_news_race_over_40_salaried)
```

[120]:
```
                 count_nonzero    median
race_grouping
unknown                  12.00 151407.91
white                   208.00 128484.46
person of color          50.00 110844.65
```

[121]:
```
current_news_race_under_40_hourly = news_hourly[news_hourly['age'] < 40].
↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
↪median]})
suppress_median(current_news_race_under_40_hourly)
```

[121]:
```
                                                   count_nonzero  median
race_ethnicity
White (United States of America)                           32.00   31.96
Black or African American (United States of Ame...         10.00   29.95
Asian (United States of America)                            7.00   25.02
```

[122]:
```
current_news_race_over_40_hourly = news_hourly[news_hourly['age'] > 39].
↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
↪median]})
suppress_median(current_news_race_over_40_hourly)
```

[122]:
```
                                  count_nonzero  median
race_ethnicity
White (United States of America)          32.00   39.86
```

1.5.3 Gender x race/ethnicity

[123]:
```
current_news_race_gender_salaried = news_salaried.
↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
↪count_nonzero]})
suppress(current_news_race_gender_salaried)
```

[123]:
```
                                                          count_nonzero
race_ethnicity                                     gender
Asian (United States of America)                   Female         34.00
                                                   Male           12.00
Black or African American (United States of Ame... Female         24.00
                                                   Male           24.00
Hispanic or Latino (United States of America)      Female         14.00
                                                   Male           14.00
Prefer Not to Disclose (United States of America)  Male            5.00
Two or More Races (United States of America)       Female          9.00
```

```
                                                              Male              5.00
White (United States of America)                              Female          188.00
                                                              Male            218.00
```

[124]:
```
current_news_race_gender_hourly = news_hourly.
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero]})
suppress(current_news_race_gender_hourly)
```

[124]:
```
                                                                     count_nonzero
race_ethnicity                                              gender
Asian (United States of America)                            Female           8.00
Black or African American (United States of Ame...          Female           8.00
                                                            Male             5.00
White (United States of America)                            Female          41.00
                                                            Male            23.00
```

[125]:
```
current_news_race_gender_median_salaried = news_salaried.
 ↪groupby(['race_grouping','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_race_gender_median_salaried)
```

[125]:
```
                        count_nonzero    median
race_grouping   gender
person of color Female          83.00  86511.34
                Male            56.00 101575.00
unknown         Female          13.00 129970.48
                Male            16.00 135280.00
white           Female         188.00  99640.00
                Male           218.00 117451.77
```

[126]:
```
current_news_race_gender_median_hourly = news_hourly.
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_race_gender_median_hourly)
```

[126]:
```
                                                                     count_nonzero  \
race_ethnicity                                              gender
Asian (United States of America)                            Female           8.00
Black or African American (United States of Ame...          Female           8.00
                                                            Male             5.00
White (United States of America)                            Female          41.00
                                                            Male            23.00


                                                                     median
race_ethnicity                                              gender
Asian (United States of America)                            Female   29.99
Black or African American (United States of Ame...          Female   30.97
                                                            Male     20.91
White (United States of America)                            Female   34.72
```

```
                                                  Male     33.38
```

[127]:
```
current_news_race_gender_under_40_salaried = news_salaried[news_salaried['age']␣
 ↪< 40].groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_race_gender_under_40_salaried)
```

[127]:
```
                                                          count_nonzero  \
race_ethnicity                                     gender
Asian (United States of America)                   Female         25.00
                                                   Male            8.00
Black or African American (United States of Ame... Female         16.00
                                                   Male            8.00
Hispanic or Latino (United States of America)      Female         12.00
                                                   Male            7.00
Two or More Races (United States of America)       Female          9.00
White (United States of America)                   Female        105.00
                                                   Male           93.00


                                                             median
race_ethnicity                                     gender
Asian (United States of America)                   Female   86000.00
                                                   Male    102890.00
Black or African American (United States of Ame... Female   85390.00
                                                   Male    127890.00
Hispanic or Latino (United States of America)      Female   80059.12
                                                   Male     75000.00
Two or More Races (United States of America)       Female   75000.00
White (United States of America)                   Female   85780.00
                                                   Male     95655.73
```

[128]:
```
current_news_race_gender_under_40_hourly = news_hourly[news_hourly['age'] < 40].
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_race_gender_under_40_hourly)
```

[128]:
```
                                                          count_nonzero  \
race_ethnicity                                     gender
Asian (United States of America)                   Female          5.00
Black or African American (United States of Ame... Female          6.00
White (United States of America)                   Female         21.00
                                                   Male           11.00


                                                         median
race_ethnicity                                     gender
Asian (United States of America)                   Female   25.02
Black or African American (United States of Ame... Female   30.97
White (United States of America)                   Female   31.92
                                                   Male     33.73
```

[129]:
```
current_news_race_gender_over_40_salaried = news_salaried[news_salaried['age']␣
↪> 39].groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_news_race_gender_over_40_salaried)
```

[129]:
```
                                                          count_nonzero  \
race_ethnicity                                     gender
Asian (United States of America)                   Female          9.00
Black or African American (United States of Ame... Female          8.00
                                                   Male           16.00
Hispanic or Latino (United States of America)      Male            7.00
White (United States of America)                   Female         83.00
                                                   Male          125.00


                                                             median
race_ethnicity                                     gender
Asian (United States of America)                   Female 111761.01
Black or African American (United States of Ame... Female 115002.24
                                                   Male   107464.14
Hispanic or Latino (United States of America)      Male   126580.00
White (United States of America)                   Female 122916.97
                                                   Male   130000.00
```

[130]:
```
current_news_race_gender_over_40_hourly = news_hourly[news_hourly['age'] > 39].
↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_news_race_gender_over_40_hourly)
```

[130]:
```
                                         count_nonzero  median
race_ethnicity                   gender
White (United States of America) Female          20.00   42.39
                                 Male            12.00   33.17
```

1.5.4 Years of service

[131]:
```
current_news_yos_salary = news_salaried.groupby(['years_of_service_grouped']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_yos_salary)
```

[131]:
```
                         count_nonzero    median
years_of_service_grouped
0                                65.00  90000.00
1-2                             128.00  93780.00
3-5                             146.00  92170.07
6-10                             60.00 112925.50
11-15                            50.00 110823.23
16-20                            68.00 127654.56
21-25                            24.00 143197.97
```

```
25+                                 33.00 139831.30
```

[132]:
```
current_news_yos_hourly = news_hourly.groupby(['years_of_service_grouped']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_yos_hourly)
```

[132]:
```
                           count_nonzero  median
years_of_service_grouped
0                                  16.00   29.49
1-2                                26.00   32.71
3-5                                 9.00   32.97
6-10                               15.00   35.91
11-15                              10.00   36.54
16-20                              11.00   32.31
21-25                               5.00   38.93
```

[133]:
```
current_news_yos_gender_salary = news_salaried.
 ↪groupby(['years_of_service_grouped','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_yos_gender_salary)
```

[133]:
```
                                  count_nonzero    median
years_of_service_grouped gender
0                        Female           39.00  80000.00
                         Male             26.00 105000.00
1-2                      Female           70.00  87390.00
                         Male             58.00 101787.80
3-5                      Female           72.00  88530.00
                         Male             74.00  95265.36
6-10                     Female           26.00 100640.36
                         Male             34.00 119561.75
11-15                    Female           25.00  98544.65
                         Male             25.00 129780.00
16-20                    Female           28.00 119826.17
                         Male             40.00 129744.80
21-25                    Female           11.00 134780.00
                         Male             13.00 148416.62
25+                      Female           13.00 142280.00
                         Male             20.00 131793.39
```

[134]:
```
current_news_yos_gender_hourly = news_hourly.
 ↪groupby(['years_of_service_grouped','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_news_yos_gender_hourly)
```

[134]:
```
                                  count_nonzero  median
years_of_service_grouped gender
0                        Female           11.00   28.21
                         Male              5.00   30.77
1-2                      Female           18.00   32.36
```

```
                         Male            8.00   33.35
3-5                      Male            6.00   32.47
6-10                     Female          8.00   31.38
                         Male            7.00   36.70
11-15                    Female          9.00   38.36
16-20                    Female          7.00   42.14
```

[135]:
```
current_news_yos_race_salary = news_salaried.
 ↪groupby(['years_of_service_grouped','race_ethnicity']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_yos_race_salary)
```

[135]:
```
count_nonzero  \
years_of_service_grouped race_ethnicity
0                        Asian (United States of America)
7.00
                         White (United States of America)
42.00
1-2                      Asian (United States of America)
13.00
                         Black or African American (United States of Ame...
10.00
                         Hispanic or Latino (United States of America)
6.00
                         Two or More Races (United States of America)
5.00
                         White (United States of America)
85.00
3-5                      Asian (United States of America)
12.00
                         Black or African American (United States of Ame...
12.00
                         Hispanic or Latino (United States of America)
14.00
                         Two or More Races (United States of America)
5.00
                         White (United States of America)
97.00
6-10                     White (United States of America)
45.00
11-15                    Black or African American (United States of Ame...
5.00
                         White (United States of America)
40.00
16-20                    Black or African American (United States of Ame...
10.00
                         White (United States of America)
53.00
```

```
21-25                     White (United States of America)
17.00
25+                       White (United States of America)
27.00

median
years_of_service_grouped race_ethnicity
0                         Asian (United States of America)
77000.00
                          White (United States of America)
100000.00
1-2                       Asian (United States of America)
84780.00
                          Black or African American (United States of Ame...
89780.00
                          Hispanic or Latino (United States of America)
82890.00
                          Two or More Races (United States of America)
68000.00
                          White (United States of America)
95780.00
3-5                       Asian (United States of America)
93630.07
                          Black or African American (United States of Ame...
97276.46
                          Hispanic or Latino (United States of America)
80809.07
                          Two or More Races (United States of America)
83340.00
                          White (United States of America)
91687.46
6-10                      White (United States of America)
115236.94
11-15                     Black or African American (United States of Ame...
124080.00
                          White (United States of America)
107685.39
16-20                     Black or African American (United States of Ame...
104397.79
                          White (United States of America)
134848.85
21-25                     White (United States of America)
134780.00
25+                       White (United States of America)
135869.69
```

[136]:
```
current_news_yos_race_hourly = news_hourly.
 ↪groupby(['years_of_service_grouped','race_ethnicity']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_yos_race_hourly)
```

[136]:
```
                                                        count_nonzero  \
years_of_service_grouped race_ethnicity
0                        White (United States of America)          6.00
1-2                      White (United States of America)         18.00
3-5                      White (United States of America)          6.00
6-10                     White (United States of America)          9.00
11-15                    White (United States of America)          8.00
16-20                    White (United States of America)          9.00
21-25                    White (United States of America)          5.00

                                                        median
years_of_service_grouped race_ethnicity
0                        White (United States of America)   29.49
1-2                      White (United States of America)   32.84
3-5                      White (United States of America)   32.47
6-10                     White (United States of America)   35.91
11-15                    White (United States of America)   39.87
16-20                    White (United States of America)   42.14
21-25                    White (United States of America)   38.93
```

[137]:
```
current_news_yos_race_gender_salary = news_salaried.
 ↪groupby(['years_of_service_grouped','race_grouping','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_yos_race_gender_salary)
```

[137]:
```
                                                count_nonzero    median
years_of_service_grouped race_grouping   gender
0                        person of color Female          12.00  76000.00
                                         Male            6.00  93500.00
                         white           Female          25.00  85000.00
                                         Male           17.00 110000.00
1-2                      person of color Female          25.00  82000.00
                                         Male            9.00 113280.00
                         unknown         Male            5.00 117780.00
                         white           Female          41.00  90780.00
                                         Male           44.00  99780.00
3-5                      person of color Female          25.00  86965.08
                                         Male           18.00  92764.52
                         white           Female          43.00  88780.00
                                         Male           54.00  97690.36
6-10                     person of color Female           5.00  79160.51
                                         Male            6.00  98630.00
                         white           Female          20.00 105206.00
```

```
                                                Male             25.00 121280.00
11-15                     person of color Female              5.00  95410.05
                          white           Female             20.00  98898.12
                                          Male               20.00 128916.43
16-20                     person of color Female              6.00 113688.41
                                          Male                8.00 104929.69
                          white           Female             21.00 128339.50
                                          Male               32.00 137948.68
21-25                     white           Female              8.00 130890.00
                                          Male                9.00 148416.62
25+                       white           Female             10.00 139074.85
                                          Male               17.00 134957.37
```

[138]:
```python
current_news_yos_race_gender_hourly = news_hourly.
 ↪groupby(['years_of_service_grouped','race_grouping','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_news_yos_race_gender_hourly)
```

[138]:
```
                                                  count_nonzero  median
years_of_service_grouped race_grouping   gender
0                        person of color Female            6.00   29.49
1-2                      person of color Female            6.00   31.59
                         white           Female           12.00   32.71
                                         Male              6.00   33.35
6-10                     white           Male              5.00   35.91
11-15                    white           Female            7.00   41.38
16-20                    white           Female            6.00   42.39
```

1.5.5 Age

[139]:
```python
current_median_news_age_5_salaried = news_salaried.groupby(['age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_median_news_age_5_salaried)
```

[139]:
```
             count_nonzero    median
age_group_5
<25                  24.00  64640.00
25-29                91.00  80500.00
30-34               103.00  90780.00
35-39                86.00 105691.31
40-44                63.00 125768.93
45-49                43.00 102795.60
50-54                70.00 115769.96
55-59                51.00 147780.00
60-64                28.00 131216.77
65+                  15.00 157095.42
```

[140]:
```
current_median_news_age_5_hourly = news_hourly.groupby(['age_group_5']).
  ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_median_news_age_5_hourly)
```

[140]:
```
             count_nonzero  median
age_group_5
<25                  14.00   29.49
25-29                23.00   30.77
30-34                11.00   33.73
35-39                 8.00   33.92
40-44                 9.00   33.13
45-49                 7.00   50.38
50-54                 7.00   33.38
55-59                 7.00   34.89
60-64                 5.00   38.82
65+                   5.00   42.64
```

[141]:
```
current_median_news_age_10_salaried = news_salaried.groupby(['age_group_10']).
  ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_median_news_age_10_salaried)
```

[141]:
```
              count_nonzero    median
age_group_10
<25                   24.00  64640.00
25-34                194.00  85890.00
35-44                149.00 115236.94
45-54                113.00 114803.00
55-64                 79.00 141015.94
65+                   15.00 157095.42
```

[142]:
```
current_median_news_age_10_hourly = news_hourly.groupby(['age_group_10']).
  ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_median_news_age_10_hourly)
```

[142]:
```
              count_nonzero  median
age_group_10
<25                   14.00   29.49
25-34                 34.00   31.01
35-44                 17.00   33.13
45-54                 14.00   41.09
55-64                 12.00   35.80
65+                    5.00   42.64
```

[143]:
```
current_news_age_5_yos_salary = news_salaried.
  ↪groupby(['age_group_5','years_of_service_grouped']).agg({'current_base_pay':␣
  ↪[np.count_nonzero, np.median]})
suppress(current_news_age_5_yos_salary)
```

[143]:
```
                                      count_nonzero    median
age_group_5 years_of_service_grouped
```

```
<25           0                                9.00  66000.00
              1-2                             13.00  63780.00
25-29         0                               19.00  82000.00
              1-2                             30.00  78500.00
              3-5                             41.00  81756.58
30-34         0                               13.00  87000.00
              1-2                             28.00  93528.23
              3-5                             43.00  88780.00
              6-10                            15.00  82311.85
35-39         0                                9.00 110000.00
              1-2                             23.00 110780.00
              3-5                             25.00 105000.00
              6-10                            16.00 120380.00
              11-15                           13.00  98544.65
40-44         0                                7.00 140000.00
              1-2                             13.00 140280.00
              3-5                             13.00 136467.50
              6-10                             9.00 114780.00
              11-15                            9.00 125768.93
              16-20                           11.00 118512.33
45-49         1-2                             10.00 144890.00
              3-5                              8.00  92972.84
              11-15                            6.00 135040.60
              16-20                           10.00 112969.04
              21-25                            5.00  89974.39
50-54         0                                5.00 105000.00
              1-2                              5.00 122780.00
              3-5                              7.00 107170.81
              6-10                             9.00 126280.47
              11-15                           11.00 111761.01
              16-20                           22.00 112559.53
              21-25                            5.00 151170.88
              25+                              6.00 112954.67
55-59         1-2                              5.00 154613.36
              11-15                            5.00 103343.66
              16-20                           18.00 137282.68
              21-25                            7.00 171928.45
              25+                              8.00 158519.18
60-64         25+                             15.00 134957.37
```

[144]:
```
current_news_age_5_yos_hourly = news_hourly.
 ↪groupby(['age_group_5','years_of_service_grouped']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_news_age_5_yos_hourly)
```

[144]:
```
                                       count_nonzero  median
age_group_5 years_of_service_grouped
<25         0                                   6.00   24.11
```

```
             1-2                                  8.00   32.00
25-29        0                                    8.00   29.49
             1-2                                 12.00   32.20
```

[145]:
```
current_news_age_10_yos_salary = news_salaried.
 ↪groupby(['age_group_10','years_of_service_grouped']).agg({'current_base_pay':
 ↪ [np.count_nonzero, np.median]})
suppress(current_news_age_10_yos_salary)
```

[145]:
```
                                       count_nonzero    median
age_group_10 years_of_service_grouped
<25          0                                  9.00  66000.00
             1-2                               13.00  63780.00
25-34        0                                 32.00  85000.00
             1-2                               58.00  86280.00
             3-5                               84.00  85890.00
             6-10                              16.00  94675.93
35-44        0                                 16.00 125000.00
             1-2                               36.00 116530.00
             3-5                               38.00 110934.68
             6-10                              25.00 115236.94
             11-15                             22.00 111892.50
             16-20                             11.00 118512.33
45-54        0                                  6.00 115000.00
             1-2                               15.00 129000.00
             3-5                               15.00  94875.00
             6-10                              12.00 105762.84
             11-15                             17.00 111761.01
             16-20                             32.00 112559.53
             21-25                             10.00 140080.00
             25+                                6.00 112954.67
55-64        1-2                                6.00 138696.68
             3-5                                6.00 137467.86
             11-15                              6.00 106232.39
             16-20                             22.00 140051.84
             21-25                             10.00 145022.96
             25+                               23.00 142280.00
```

[146]:
```
current_news_age_10_yos_hourly = news_hourly.
 ↪groupby(['age_group_10','years_of_service_grouped']).agg({'current_base_pay':
 ↪ [np.count_nonzero, np.median]})
suppress(current_news_age_10_yos_hourly)
```

[146]:
```
                                       count_nonzero  median
age_group_10 years_of_service_grouped
<25          0                                  6.00   24.11
             1-2                                8.00   32.00
25-34        0                                  9.00   30.77
             1-2                               16.00   32.71
```

```
             3-5                                    6.00   29.99
35-44        11-15                                  6.00   33.92
```

[147]:
```python
current_median_news_age_5_gender_salaried = news_salaried.
 ↪groupby(['age_group_5','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_news_age_5_gender_salaried)
```

[147]:
```
                     count_nonzero    median
age_group_5 gender
<25         Female           19.00  64280.00
            Male              5.00  72000.00
25-29       Female           60.00  80000.00
            Male             31.00  85500.00
30-34       Female           57.00  87000.00
            Male             46.00  97827.86
35-39       Female           38.00  98891.57
            Male             48.00 116030.00
40-44       Female           22.00 133200.02
            Male             41.00 125000.00
45-49       Female           20.00 117294.59
            Male             23.00  99725.00
50-54       Female           29.00 108864.49
            Male             41.00 126280.47
55-59       Female           22.00 145654.99
            Male             29.00 147780.00
60-64       Female           12.00 129324.85
            Male             16.00 131216.77
65+         Female            5.00 157095.42
            Male             10.00 156259.68
```

[148]:
```python
current_median_news_age_5_gender_hourly = news_hourly.
 ↪groupby(['age_group_5','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_news_age_5_gender_hourly)
```

[148]:
```
                     count_nonzero  median
age_group_5 gender
<25         Female           12.00   31.38
25-29       Female           17.00   31.17
            Male              6.00   20.96
30-34       Male              7.00   33.73
35-39       Female            5.00   31.92
40-44       Female            5.00   41.43
45-49       Female            6.00   48.55
50-54       Female            5.00   38.93
55-59       Male              5.00   34.89
```

[149]:
```
current_median_news_age_10_gender_salaried = news_salaried.
→groupby(['age_group_10','gender']).agg({'current_base_pay': [np.
→count_nonzero, np.median]})
suppress(current_median_news_age_10_gender_salaried)
```

[149]:
```
                          count_nonzero    median
age_group_10 gender
<25          Female               19.00  64280.00
             Male                  5.00  72000.00
25-34        Female              117.00  83146.67
             Male                 77.00  92500.00
35-44        Female               60.00 105691.31
             Male                 89.00 118785.00
45-54        Female               49.00 108864.49
             Male                 64.00 117981.79
55-64        Female               34.00 140423.62
             Male                 45.00 146541.57
65+          Female                5.00 157095.42
             Male                 10.00 156259.68
```

[150]:
```
current_median_news_age_10_gender_hourly = news_hourly.
→groupby(['age_group_10','gender']).agg({'current_base_pay': [np.
→count_nonzero, np.median]})
suppress(current_median_news_age_10_gender_hourly)
```

[150]:
```
                          count_nonzero  median
age_group_10 gender
<25          Female               12.00   31.38
25-34        Female               21.00   31.17
             Male                 13.00   30.77
35-44        Female               10.00   33.12
             Male                  7.00   35.90
45-54        Female               11.00   41.38
55-64        Female                5.00   42.14
             Male                  7.00   33.41
```

[151]:
```
current_median_news_age_5_race_salaried = news_salaried.
→groupby(['age_group_5','race_ethnicity']).agg({'current_base_pay': [np.
→count_nonzero, np.median]})
suppress(current_median_news_age_5_race_salaried)
```

[151]:
```
                                                                count_nonzero  \
age_group_5 race_ethnicity
<25         Asian (United States of America)                             5.00
            White (United States of America)                            12.00
25-29       Asian (United States of America)                            11.00
            Black or African American (United States of Ame...           6.00
            Two or More Races (United States of America)                 6.00
            White (United States of America)                            59.00
```

```
30-34        Asian (United States of America)                          10.00
             Black or African American (United States of Ame...         9.00
             Hispanic or Latino (United States of America)              6.00
             White (United States of America)                          66.00
35-39        Asian (United States of America)                           7.00
             Black or African American (United States of Ame...         7.00
             Hispanic or Latino (United States of America)              7.00
             White (United States of America)                          61.00
40-44        Black or African American (United States of Ame...         6.00
             White (United States of America)                          43.00
45-49        White (United States of America)                          36.00
50-54        Asian (United States of America)                           5.00
             Black or African American (United States of Ame...        10.00
             Hispanic or Latino (United States of America)              5.00
             White (United States of America)                          48.00
55-59        White (United States of America)                          43.00
60-64        White (United States of America)                          25.00
65+          White (United States of America)                          13.00

                                                                 median
age_group_5 race_ethnicity
<25          Asian (United States of America)                  65780.00
             White (United States of America)                  65140.00
25-29        Asian (United States of America)                  77000.00
             Black or African American (United States of Ame...  81000.00
             Two or More Races (United States of America)      75690.00
             White (United States of America)                  81756.58
30-34        Asian (United States of America)                  95780.00
             Black or African American (United States of Ame...  88132.61
             Hispanic or Latino (United States of America)     80596.26
             White (United States of America)                  92640.00
35-39        Asian (United States of America)                 115000.00
             Black or African American (United States of Ame...  96147.48
             Hispanic or Latino (United States of America)     79618.25
             White (United States of America)                 105780.00
40-44        Black or African American (United States of Ame... 122610.00
             White (United States of America)                 126080.00
45-49        White (United States of America)                 104522.64
50-54        Asian (United States of America)                 103150.00
             Black or African American (United States of Ame... 106932.24
             Hispanic or Latino (United States of America)    126764.81
             White (United States of America)                 120481.79
55-59        White (United States of America)                 147780.00
60-64        White (United States of America)                 122780.00
65+          White (United States of America)                 159300.00
```

[152]:
```
current_median_news_age_5_race_hourly = news_hourly.
↪groupby(['age_group_5','race_ethnicity']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_median_news_age_5_race_hourly)
```

[152]:
```
                                                                  count_nonzero  \
age_group_5 race_ethnicity
<25         White (United States of America)                               7.00
25-29       Black or African American (United States of Ame...             8.00
            White (United States of America)                              11.00
30-34       White (United States of America)                               9.00
35-39       White (United States of America)                               5.00
40-44       White (United States of America)                               7.00
45-49       White (United States of America)                               6.00
50-54       White (United States of America)                               5.00
55-59       White (United States of America)                               6.00
60-64       White (United States of America)                               5.00

                                                                  median
age_group_5 race_ethnicity
<25         White (United States of America)                       18.50
25-29       Black or African American (United States of Ame...     30.15
            White (United States of America)                       30.77
30-34       White (United States of America)                       33.73
35-39       White (United States of America)                       34.72
40-44       White (United States of America)                       41.43
45-49       White (United States of America)                       48.55
50-54       White (United States of America)                       38.93
55-59       White (United States of America)                       33.93
60-64       White (United States of America)                       38.82
```

[153]:
```
current_median_news_age_5_race_group_salaried = news_salaried.
↪groupby(['age_group_5','race_grouping']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_median_news_age_5_race_group_salaried)
```

[153]:
```
                                count_nonzero    median
age_group_5 race_grouping
<25         person of color             11.00  63780.00
            white                       12.00  65140.00
25-29       person of color             27.00  80000.00
            unknown                      5.00  88280.00
            white                       59.00  81756.58
30-34       person of color             28.00  86982.54
            unknown                      9.00 108000.00
            white                       66.00  92640.00
35-39       person of color             23.00  99238.50
            white                       61.00 105780.00
```

```
40-44         person of color          15.00 108324.02
              unknown                   5.00 145500.00
              white                    43.00 126080.00
45-49         person of color           6.00  84937.50
              white                    36.00 104522.64
50-54         person of color          20.00 109396.39
              white                    48.00 120481.79
55-59         person of color           6.00 131686.62
              white                    43.00 147780.00
60-64         white                    25.00 122780.00
65+           white                    13.00 159300.00
```

[154]:
```python
current_median_news_age_5_race_group_hourly = news_hourly.
 ↪groupby(['age_group_5','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_news_age_5_race_group_hourly)
```

[154]:
```
                             count_nonzero  median
age_group_5 race_grouping
<25         person of color           6.00   29.49
            white                     7.00   18.50
25-29       person of color          12.00   27.07
            white                    11.00   30.77
30-34       white                     9.00   33.73
35-39       white                     5.00   34.72
40-44       white                     7.00   41.43
45-49       white                     6.00   48.55
50-54       white                     5.00   38.93
55-59       white                     6.00   33.93
60-64       white                     5.00   38.82
```

[155]:
```python
current_median_news_age_10_race_salaried = news_salaried.
 ↪groupby(['age_group_10','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_news_age_10_race_salaried)
```

[155]:
```
                                                                  count_nonzero
\
age_group_10 race_ethnicity
<25          Asian (United States of America)                              5.00
             White (United States of America)                             12.00
25-34        Asian (United States of America)                             21.00
             Black or African American (United States of Ame...           15.00
             Hispanic or Latino (United States of America)                10.00
             Prefer Not to Disclose (United States of America)             5.00
             Two or More Races (United States of America)                  9.00
             White (United States of America)                            125.00
35-44        Asian (United States of America)                             11.00
             Black or African American (United States of Ame...           13.00
```

```
             Hispanic or Latino (United States of America)           10.00
             White (United States of America)                       104.00
45-54        Asian (United States of America)                         7.00
             Black or African American (United States of Ame...      12.00
             Hispanic or Latino (United States of America)            6.00
             White (United States of America)                        84.00
55-64        Black or African American (United States of Ame...       5.00
             White (United States of America)                        68.00
65+          White (United States of America)                        13.00

                                                                median
age_group_10 race_ethnicity
<25          Asian (United States of America)                  65780.00
             White (United States of America)                  65140.00
25-34        Asian (United States of America)                  86000.00
             Black or African American (United States of Ame...  87000.00
             Hispanic or Latino (United States of America)     81249.94
             Prefer Not to Disclose (United States of America)  78500.00
             Two or More Races (United States of America)      76380.00
             White (United States of America)                  86000.00
35-44        Asian (United States of America)                 108324.02
             Black or African American (United States of Ame... 118530.00
             Hispanic or Latino (United States of America)     90390.04
             White (United States of America)                 115258.47
45-54        Asian (United States of America)                 111761.01
             Black or African American (United States of Ame... 102465.54
             Hispanic or Latino (United States of America)    126672.40
             White (United States of America)                 116687.17
55-64        Black or African American (United States of Ame... 123541.95
             White (United States of America)                 140051.84
65+          White (United States of America)                 159300.00
```

[156]:
```python
current_median_news_age_10_race_hourly = news_hourly.
 ↪groupby(['age_group_10','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_news_age_10_race_hourly)
```

[156]:
```
                                                              count_nonzero
\
age_group_10 race_ethnicity
<25          White (United States of America)                         7.00
25-34        Black or African American (United States of Ame...       8.00
             White (United States of America)                        20.00
35-44        White (United States of America)                        12.00
45-54        White (United States of America)                        11.00
55-64        White (United States of America)                        11.00

                                                              median
```

```
age_group_10 race_ethnicity
<25          White (United States of America)                        18.50
25-34        Black or African American (United States of Ame...     30.15
             White (United States of America)                        31.26
35-44        White (United States of America)                        35.31
45-54        White (United States of America)                        41.38
55-64        White (United States of America)                        34.89
```

[157]:
```
current_median_news_age_10_race_group_salaried = news_salaried.
 ↪groupby(['age_group_10','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_news_age_10_race_group_salaried)
```

[157]:
```
                              count_nonzero    median
age_group_10 race_grouping
<25          person of color          11.00  63780.00
             white                    12.00  65140.00
25-34        person of color          55.00  83340.00
             unknown                  14.00 106890.00
             white                   125.00  86000.00
35-44        person of color          38.00 102890.00
             unknown                   7.00 140280.00
             white                   104.00 115258.47
45-54        person of color          26.00 106932.24
             white                    84.00 116687.17
55-64        person of color           8.00 140423.62
             white                    68.00 140051.84
65+          white                    13.00 159300.00
```

[158]:
```
current_median_news_age_10_race_group_hourly = news_hourly.
 ↪groupby(['age_group_10','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_news_age_10_race_group_hourly)
```

[158]:
```
                              count_nonzero  median
age_group_10 race_grouping
<25          person of color           6.00   29.49
             white                     7.00   18.50
25-34        person of color          13.00   29.12
             white                    20.00   31.26
35-44        person of color           5.00   23.93
             white                    12.00   35.31
45-54        white                    11.00   41.38
55-64        white                    11.00   34.89
```

[159]:
```
current_median_news_age_5_race_gender_salaried = news_salaried.
 ↪groupby(['age_group_5','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_news_age_5_race_gender_salaried)
```

[159]:
```
count_nonzero  \
age_group_5 race_ethnicity                                     gender
<25         Asian (United States of America)                   Female
5.00
            White (United States of America)                   Female
9.00
25-29       Asian (United States of America)                   Female
9.00
            Black or African American (United States of Ame... Female
5.00
            White (United States of America)                   Female
38.00
                                                               Male
21.00
30-34       Asian (United States of America)                   Female
8.00
            Black or African American (United States of Ame... Female
5.00
            Hispanic or Latino (United States of America)      Female
6.00
            White (United States of America)                   Female
32.00
                                                               Male
34.00
35-39       Black or African American (United States of Ame... Female
5.00
            Hispanic or Latino (United States of America)      Male
5.00
            White (United States of America)                   Female
26.00
                                                               Male
35.00
40-44       Black or African American (United States of Ame... Male
5.00
            White (United States of America)                   Female
11.00
                                                               Male
32.00
45-49       White (United States of America)                   Female
19.00
                                                               Male
17.00
50-54       Black or African American (United States of Ame... Male
6.00
            Hispanic or Latino (United States of America)      Male
5.00
            White (United States of America)                   Female
```

```
23.00
                                                              Male
25.00
55-59        White (United States of America)                 Female
16.00
                                                              Male
27.00
60-64        White (United States of America)                 Female
10.00
                                                              Male
15.00
65+          White (United States of America)                 Male
9.00

                                                                       median
age_group_5 race_ethnicity                                    gender
<25          Asian (United States of America)                 Female  65780.00
             White (United States of America)                 Female  64280.00
25-29        Asian (United States of America)                 Female  77000.00
             Black or African American (United States of Ame... Female  80000.00
             White (United States of America)                 Female  81878.29
                                                              Male    76780.00
30-34        Asian (United States of America)                 Female 100780.00
             Black or African American (United States of Ame... Female  85780.00
             Hispanic or Latino (United States of America)    Female  80596.26
             White (United States of America)                 Female  87660.00
                                                              Male    94280.00
35-39        Black or African American (United States of Ame... Female  87808.33
             Hispanic or Latino (United States of America)    Male    75000.00
             White (United States of America)                 Female  99272.32
                                                              Male   115280.00
40-44        Black or African American (United States of Ame... Male   124080.00
             White (United States of America)                 Female 140000.00
                                                              Male   125384.46
45-49        White (United States of America)                 Female 106249.68
                                                              Male   102795.60
50-54        Black or African American (United States of Ame... Male   107464.14
             Hispanic or Latino (United States of America)    Male   126764.81
             White (United States of America)                 Female 114803.00
                                                              Male   128052.85
55-59        White (United States of America)                 Female 138564.42
                                                              Male   153922.58
60-64        White (United States of America)                 Female 121896.57
                                                              Male   127476.17
65+          White (United States of America)                 Male   159458.37
```

[160]:
```
current_median_news_age_5_race_gender_hourly = news_hourly.
 ↪groupby(['age_group_5','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_news_age_5_race_gender_hourly)
```

[160]:
```
                                                         count_nonzero  median
age_group_5 race_ethnicity                     gender
<25         White (United States of America) Female             5.00   32.00
25-29       White (United States of America) Female            10.00   31.23
30-34       White (United States of America) Male               6.00   34.43
45-49       White (United States of America) Female             6.00   48.55
55-59       White (United States of America) Male               5.00   34.89
```

[161]:
```
current_median_news_age_5_race_group_gender_salaried = news_salaried.
 ↪groupby(['age_group_5','race_grouping','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_news_age_5_race_group_gender_salaried)
```

[161]:
```
                                      count_nonzero    median
age_group_5 race_grouping   gender
<25         person of color Female            10.00  64390.00
            white           Female             9.00  64280.00
25-29       person of color Female            19.00  77000.00
                            Male               8.00  88540.00
            white           Female            38.00  81878.29
                            Male              21.00  76780.00
30-34       person of color Female            22.00  86372.54
                            Male               6.00 106000.00
            unknown         Male               6.00 120390.00
            white           Female            32.00  87660.00
                            Male              34.00  94280.00
35-39       person of color Female            11.00  96147.48
                            Male              12.00 115530.00
            white           Female            26.00  99272.32
                            Male              35.00 115280.00
40-44       person of color Female             8.00 113418.18
                            Male               7.00  94643.69
            white           Female            11.00 140000.00
                            Male              32.00 125384.46
45-49       person of color Male               5.00  75000.00
            white           Female            19.00 106249.68
                            Male              17.00 102795.60
50-54       person of color Female             6.00 102904.48
                            Male              14.00 113138.72
            white           Female            23.00 114803.00
                            Male              25.00 128052.85
55-59       white           Female            16.00 138564.42
                            Male              27.00 153922.58
```

```
60-64        white           Female          10.00 121896.57
                             Male            15.00 127476.17
65+          white           Male             9.00 159458.37
```

[162]:
```
current_median_news_age_5_race_group_gender_hourly = news_hourly.
 ↪groupby(['age_group_5','race_grouping','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_news_age_5_race_group_gender_hourly)
```

[162]:
```
                                        count_nonzero  median
age_group_5 race_grouping   gender
<25         person of color Female               6.00   29.49
            white           Female               5.00   32.00
25-29       person of color Female               7.00   31.17
                            Male                 5.00   20.91
            white           Female              10.00   31.23
30-34       white           Male                 6.00   34.43
45-49       white           Female               6.00   48.55
55-59       white           Male                 5.00   34.89
```

[163]:
```
current_median_news_age_10_race_gender_salaried = news_salaried.
 ↪groupby(['age_group_10','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_news_age_10_race_gender_salaried)
```

[163]:
```
count_nonzero  \
age_group_10 race_ethnicity                                     gender
<25          Asian (United States of America)                   Female
5.00
             White (United States of America)                   Female
9.00
25-34        Asian (United States of America)                   Female
17.00
             Black or African American (United States of Ame... Female
10.00
                                                                Male
5.00
             Hispanic or Latino (United States of America)      Female
8.00
             Two or More Races (United States of America)       Female
6.00
             White (United States of America)                   Female
70.00
                                                                Male
55.00
35-44        Asian (United States of America)                   Female
7.00
             Black or African American (United States of Ame... Female
6.00
```

```
                                                                 Male
7.00
             Hispanic or Latino (United States of America)       Male
6.00
             White (United States of America)                    Female
37.00
                                                                 Male
67.00
45-54        Black or African American (United States of Ame... Male
8.00
             Hispanic or Latino (United States of America)       Male
6.00
             White (United States of America)                    Female
42.00
                                                                 Male
42.00
55-64        White (United States of America)                    Female
26.00
                                                                 Male
42.00
65+          White (United States of America)                    Male
9.00

                                                                           median
age_group_10 race_ethnicity                                      gender
<25          Asian (United States of America)                    Female  65780.00
             White (United States of America)                    Female  64280.00
25-34        Asian (United States of America)                    Female  87000.00
             Black or African American (United States of Ame... Female  81000.00
                                                                 Male   140000.00
             Hispanic or Latino (United States of America)       Female  81249.94
             Two or More Races (United States of America)        Female  75690.00
             White (United States of America)                    Female  84640.00
                                                                 Male    90780.00
35-44        Asian (United States of America)                    Female  99238.50
             Black or African American (United States of Ame... Female  91977.90
                                                                 Male   125000.00
             Hispanic or Latino (United States of America)       Male    82500.04
             White (United States of America)                    Female 105000.00
                                                                 Male   120780.00
45-54        Black or African American (United States of Ame... Male   102465.54
             Hispanic or Latino (United States of America)       Male   126672.40
             White (United States of America)                    Female 111589.34
                                                                 Male   123530.24
55-64        White (United States of America)                    Female 130924.43
                                                                 Male   147160.79
65+          White (United States of America)                    Male   159458.37
```

[164]:
```
current_median_news_age_10_race_gender_hourly = news_hourly.
↪groupby(['age_group_10','race_ethnicity','gender']).agg({'current_base_pay':␣
↪[np.count_nonzero, np.median]})
suppress(current_median_news_age_10_race_gender_hourly)
```

[164]:
```
                                                        count_nonzero  median
age_group_10 race_ethnicity                   gender
<25          White (United States of America) Female             5.00   32.00
25-34        White (United States of America) Female            13.00   30.84
                                              Male               7.00   33.73
35-44        White (United States of America) Female             7.00   34.72
                                              Male               5.00   35.90
45-54        White (United States of America) Female             9.00   44.46
55-64        White (United States of America) Male               7.00   33.41
```

[165]:
```
current_median_news_age_10_race_group_gender_salaried = news_salaried.
↪groupby(['age_group_10','race_grouping','gender']).agg({'current_base_pay':␣
↪[np.count_nonzero, np.median]})
suppress(current_median_news_age_10_race_group_gender_salaried)
```

[165]:
```
                                     count_nonzero    median
age_group_10 race_grouping   gender
<25          person of color Female          10.00  64390.00
             white           Female           9.00  64280.00
25-34        person of color Female          41.00  81999.88
                             Male            14.00  89540.00
             unknown         Female           6.00  92140.00
                             Male             8.00 120390.00
             white           Female          70.00  84640.00
                             Male            55.00  90780.00
35-44        person of color Female          19.00 100000.00
                             Male            19.00 113280.00
             white           Female          37.00 105000.00
                             Male            67.00 120780.00
45-54        person of color Female           7.00 108864.49
                             Male            19.00 105000.00
             white           Female          42.00 111589.34
                             Male            42.00 123530.24
55-64        person of color Female           6.00 142688.10
             white           Female          26.00 130924.43
                             Male            42.00 147160.79
65+          white           Male             9.00 159458.37
```

[166]:
```
current_median_news_age_10_race_group_gender_hourly = news_hourly.
↪groupby(['age_group_10','race_grouping','gender']).agg({'current_base_pay':␣
↪[np.count_nonzero, np.median]})
suppress(current_median_news_age_10_race_group_gender_hourly)
```

[166]:
```
                                     count_nonzero  median
age_group_10 race_grouping   gender
<25          person of color Female           6.00   29.49
             white           Female           5.00   32.00
25-34        person of color Female           7.00   31.17
                             Male             6.00   20.96
             white           Female          13.00   30.84
                             Male             7.00   33.73
35-44        white           Female           7.00   34.72
                             Male             5.00   35.90
45-54        white           Female           9.00   44.46
55-64        white           Male             7.00   33.41
```

1.5.6 Desks

[167]:
```
current_news_median_desk_salaried = news_salaried.groupby(['desk']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_salaried)
```

[167]:
```
                        count_nonzero    median
desk
National                       106.00 149520.50
Foreign                         25.00 135000.00
Financial                       38.00 133509.94
Style                           45.00 107170.81
Local                           65.00 105780.00
Editorial                       33.00 105000.00
Graphics                        15.00 100780.00
Universal Desk                   8.00 100444.28
Sports                          37.00 100000.00
Outlook                          6.00  99937.50
non-newsroom                    29.00  95780.00
Audio                            7.00  92000.00
Design                          45.00  88065.25
Operations                       6.00  87890.00
Multiplatform                   26.00  86104.00
Video                           46.00  84250.00
Emerging News Products          30.00  75000.00
```

[168]:
```
current_news_median_desk_hourly = news_hourly.groupby(['desk']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_hourly)
```

[168]:
```
                count_nonzero  median
desk
Audio                    6.00   39.75
Universal Desk           8.00   38.67
non-newsroom             7.00   37.58
```

```
Multiplatform          16.00   34.09
Editorial               5.00   32.31
National               12.00   31.74
Local                   5.00   26.46
Style                   9.00   21.77
Sports                 11.00   20.91
Operations              7.00   15.59
```

[169]:
```
current_news_median_desk_gender_salaried = news_salaried.
 ↪groupby(['desk','gender']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_news_median_desk_gender_salaried)
```

[169]:
```
                                count_nonzero    median
desk                  gender
National              Male              57.00 169780.00
Foreign               Male              14.00 145390.00
Editorial             Male              18.00 140271.26
National              Female            49.00 139780.00
Financial             Male              25.00 136467.50
Foreign               Female            11.00 129970.48
Financial             Female            13.00 125000.00
Local                 Male              31.00 118850.00
Style                 Male              20.00 115036.81
Sports                Female             9.00 115000.00
Graphics              Male               8.00 106925.50
Style                 Female            25.00 106602.62
non-newsroom          Male              16.00 102890.00
Local                 Female            34.00 100390.00
Sports                Male              28.00  99862.50
Editorial             Female            15.00  98405.45
Universal Desk        Female             5.00  96944.47
Graphics              Female             7.00  95780.00
Design                Male              24.00  95211.85
non-newsroom          Female            13.00  95000.00
Audio                 Female             5.00  92000.00
Multiplatform         Male              11.00  88151.74
Video                 Male              18.00  88130.00
Operations            Female             5.00  85000.00
Multiplatform         Female            15.00  84780.00
Video                 Female            28.00  79250.00
Design                Female            21.00  78641.52
Emerging News Products Female           21.00  77000.00
                      Male               9.00  73172.23
```

[170]:
```
current_news_median_desk_gender_hourly = news_hourly.groupby(['desk','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_gender_hourly)
```

[170]:

```
                            count_nonzero  median
desk            gender
Audio           Female               5.00   41.03
Universal Desk  Female               5.00   35.90
Multiplatform   Female              13.00   34.72
Sports          Male                 8.00   32.97
National        Female               8.00   32.71
Style           Female               8.00   26.73
```

[171]:

```
current_news_median_desk_race_salaried = news_salaried.
 ↪groupby(['desk','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_salaried)
```

[171]:

```
                                        count_nonzero    median
desk                    race_grouping
National                white                   84.00 168780.00
Foreign                 unknown                 20.00 137500.00
Financial               white                   29.00 136467.50
National                person of color         21.00 130780.00
Editorial               white                   27.00 120000.27
Financial               person of color          6.00 115570.00
Style                   white                   38.00 112371.03
Local                   white                   46.00 107707.84
Sports                  person of color          7.00 105000.00
Universal Desk          white                    5.00 104393.45
non-newsroom            white                   22.00 101390.00
Graphics                white                    9.00 100780.00
Sports                  white                   30.00  99862.50
Editorial               person of color          5.00  98405.45
Graphics                person of color          6.00  97280.00
Style                   person of color          7.00  96147.48
non-newsroom            person of color          7.00  95780.00
Audio                   white                    5.00  92000.00
Local                   person of color         19.00  91450.00
Design                  white                   27.00  90280.00
Video                   white                   28.00  88000.00
Multiplatform           white                   22.00  87289.87
Design                  person of color         17.00  82000.00
Video                   person of color         16.00  76390.00
Emerging News Products  person of color         10.00  76000.00
                        white                   20.00  75000.00
```

[172]:

```
current_news_median_desk_race_hourly = news_hourly.
 ↪groupby(['desk','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_hourly)
```

[172]:
```
                                                count_nonzero  median
desk            race_ethnicity
Style           White (United States of America)         5.00   38.93
Universal Desk  White (United States of America)         6.00   38.67
Multiplatform   White (United States of America)        12.00   36.54
Sports          White (United States of America)         9.00   32.97
National        White (United States of America)         9.00   32.71
```

[173]:
```
current_news_median_desk_race_gender_salaried = news_salaried.
 ↪groupby(['desk','race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_gender_salaried)
```

[173]:
```
  count_nonzero  \
desk                    race_ethnicity                                      gender
National                White (United States of America)                    Male
46.00
Financial               White (United States of America)                    Male
21.00
Editorial               White (United States of America)                    Male
16.00
National                White (United States of America)                    Female
38.00
                        Black or African American (United States of Ame... Male
8.00
                        Asian (United States of America)                    Female
8.00
Sports                  White (United States of America)                    Female
6.00
Financial               White (United States of America)                    Female
8.00
Local                   White (United States of America)                    Male
25.00
non-newsroom            White (United States of America)                    Male
12.00
Style                   White (United States of America)                    Male
18.00
                                                                            Female
20.00
Design                  White (United States of America)                    Male
12.00
Graphics                White (United States of America)                    Male
5.00
Editorial               White (United States of America)                    Female
11.00
Local                   White (United States of America)                    Female
21.00
Sports                  White (United States of America)                    Male
```

```
24.00
Design                 Black or African American (United States of Ame... Male
6.00
Video                  White (United States of America)                   Male
13.00
Multiplatform          White (United States of America)                   Male
9.00
non-newsroom           White (United States of America)                   Female
10.00
Video                  White (United States of America)                   Female
15.00
Local                  Hispanic or Latino (United States of America)      Female
6.00
Multiplatform          White (United States of America)                   Female
13.00
Design                 White (United States of America)                   Female
15.00
Emerging News Products White (United States of America)                   Male
7.00
                                                                          Female
13.00

    median
desk                   race_ethnicity                                     gender
National               White (United States of America)                   Male
175374.24
Financial              White (United States of America)                   Male
140387.17
Editorial              White (United States of America)                   Male
140271.26
National               White (United States of America)                   Female
139733.72
                       Black or African American (United States of Ame... Male
135390.00
                       Asian (United States of America)                   Female
132780.00
Sports                 White (United States of America)                   Female
132014.99
Financial              White (United States of America)                   Female
130390.00
Local                  White (United States of America)                   Male
119553.20
non-newsroom           White (United States of America)                   Male
115640.00
Style                  White (United States of America)                   Male
115036.81
                                                                          Female
```

```
109841.38
Design                 White (United States of America)                   Male
103330.48
Graphics               White (United States of America)                   Male
102780.00
Editorial              White (United States of America)                   Female
102234.81
Local                  White (United States of America)                   Female
100780.00
Sports                 White (United States of America)                   Male
98393.66
Design                 Black or African American (United States of Ame... Male
93910.58
Video                  White (United States of America)                   Male
90780.00
Multiplatform          White (United States of America)                   Male
88151.74
non-newsroom           White (United States of America)                   Female
86160.00
Video                  White (United States of America)                   Female
86000.00
Local                  Hispanic or Latino (United States of America)      Female
85372.54
Multiplatform          White (United States of America)                   Female
84780.00
Design                 White (United States of America)                   Female
79140.00
Emerging News Products White (United States of America)                   Male
75000.00
                                                                          Female
75000.00
```

[174]:

```
current_news_median_desk_race_gender_hourly = news_hourly.
↪groupby(['desk','race_ethnicity','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_gender_hourly)
```

[174]:

```
                                                        count_nonzero  median
desk          race_ethnicity                   gender
Style         White (United States of America) Female            5.00   38.93
Multiplatform White (United States of America) Female            9.00   38.36
Sports        White (United States of America) Male              7.00   32.97
National      White (United States of America) Female            6.00   32.71
```

[175]:

```
current_news_median_desk_race_group_gender_salaried = news_salaried.
↪groupby(['desk','race_grouping','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_group_gender_salaried)
```

[175]:

```
                                                 count_nonzero    median
desk                   race_grouping   gender
National               white           Male              46.00 175374.24
Financial              white           Male              21.00 140387.17
Editorial              white           Male              16.00 140271.26
Foreign                unknown         Male              11.00 140000.00
National               white           Female            38.00 139733.72
Foreign                unknown         Female             9.00 135000.00
National               person of color Female            10.00 132780.00
Sports                 white           Female             6.00 132014.99
National               person of color Male              11.00 130780.00
Financial              white           Female             8.00 130390.00
                       person of color Female             5.00 121140.00
Local                  white           Male              25.00 119553.20
non-newsroom           white           Male              12.00 115640.00
Style                  white           Male              18.00 115036.81
                                       Female            20.00 109841.38
Design                 white           Male              12.00 103330.48
Graphics               white           Male               5.00 102780.00
Editorial              white           Female            11.00 102234.81
Local                  person of color Male               6.00 101674.57
                       white           Female            21.00 100780.00
Sports                 white           Male              24.00  98393.66
Style                  person of color Female             5.00  96147.48
Local                  person of color Female            13.00  91450.00
Design                 person of color Male              11.00  90780.00
Video                  white           Male              13.00  90780.00
Multiplatform          white           Male               9.00  88151.74
non-newsroom           white           Female            10.00  86160.00
Video                  white           Female            15.00  86000.00
Multiplatform          white           Female            13.00  84780.00
Design                 white           Female            15.00  79140.00
Emerging News Products person of color Female             8.00  78500.00
Video                  person of color Female            12.00  76390.00
Emerging News Products white           Male               7.00  75000.00
                                       Female            13.00  75000.00
Design                 person of color Female             6.00  73500.00
```

[176]:

```
current_news_median_desk_race_group_gender_hourly = news_hourly.
↪groupby(['desk','race_grouping','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_group_gender_hourly)
```

[176]:

```
                                        count_nonzero  median
desk          race_grouping gender
Style         white         Female               5.00   38.93
Multiplatform white         Female               9.00   38.36
Sports        white         Male                 7.00   32.97
```

```
National      white         Female          6.00   32.71
```

[177]:
```python
current_news_median_desk_race_gender_age5_salaried = news_salaried.
 ↪groupby(['desk','race_ethnicity','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_gender_age5_salaried)
```

[177]:
```
count_nonzero  \
desk                    race_ethnicity                    gender age_group_5
National                White (United States of America) Male   40-44
9.00
                                                                 30-34
9.00
                                                          Female 50-54
5.00
                                                                 55-59
6.00
                                                                 40-44
5.00
                                                          Male   35-39
10.00
Sports                  White (United States of America) Male   35-39
7.00
Financial               White (United States of America) Male   35-39
5.00
Local                   White (United States of America) Male   55-59
6.00
National                White (United States of America) Female 25-29
5.00
                                                                 35-39
6.00
Video                   White (United States of America) Female 30-34
5.00
Sports                  White (United States of America) Male   45-49
5.00
Emerging News Products White (United States of America) Female 25-29
7.00

median
desk                    race_ethnicity                    gender age_group_5
National                White (United States of America) Male   40-44
170000.00
                                                                 30-34
169780.00
                                                          Female 50-54
167780.00
                                                                 55-59
162854.23
```

```
                                                               40-44
160000.00
                                                        Male   35-39
148640.00
Sports                 White (United States of America) Male   35-39
147300.00
Financial              White (United States of America) Male   35-39
144755.00
Local                  White (United States of America) Male   55-59
127654.56
National               White (United States of America) Female 25-29
125000.00
                                                               35-39
109390.00
Video                  White (United States of America) Female 30-34
88000.00
Sports                 White (United States of America) Male   45-49
87277.77
Emerging News Products White (United States of America) Female 25-29
70000.00
```

[178]:
```
current_news_median_desk_race_gender_age5_hourly = news_hourly.
 ↪groupby(['desk','race_ethnicity','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_gender_age5_hourly)
```

[178]:
```
Empty DataFrame
Columns: [count_nonzero, median]
Index: []
```

[179]:
```
current_news_median_desk_race_group_gender_age5_salaried = news_salaried.
 ↪groupby(['desk','race_grouping','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_group_gender_age5_salaried)
```

[179]:
```
                                                     count_nonzero  \
desk                   race_grouping  gender age_group_5
National               white          Male   40-44               9.00
                                             30-34               9.00
                                      Female 50-54               5.00
                                             55-59               6.00
                                             40-44               5.00
                                      Male   35-39              10.00
Sports                 white          Male   35-39               7.00
Financial              white          Male   35-39               5.00
Local                  white          Male   55-59               6.00
Foreign                unknown        Male   30-34               5.00
National               white          Female 25-29               5.00
                                             35-39               6.00
```

```
Video                  white           Female 30-34                 5.00
Sports                 white           Male   45-49                 5.00
Video                  person of color Female 25-29                 8.00
Emerging News Products white           Female 25-29                 7.00

                                                              median
desk                   race_grouping   gender age_group_5
National               white           Male   40-44        170000.00
                                              30-34        169780.00
                                       Female 50-54        167780.00
                                              55-59        162854.23
                                              40-44        160000.00
                                       Male   35-39        148640.00
Sports                 white           Male   35-39        147300.00
Financial              white           Male   35-39        144755.00
Local                  white           Male   55-59        127654.56
Foreign                unknown         Male   30-34        125000.00
National               white           Female 25-29        125000.00
                                              35-39        109390.00
Video                  white           Female 30-34         88000.00
Sports                 white           Male   45-49         87277.77
Video                  person of color Female 25-29         76390.00
Emerging News Products white           Female 25-29         70000.00
```

[180]:
```
current_news_median_desk_race_group_gender_age5_hourly = news_hourly.
 ↪groupby(['desk','race_grouping','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_race_group_gender_age5_hourly)
```

[180]:
```
Empty DataFrame
Columns: [count_nonzero, median]
Index: []
```

[181]:
```
current_news_median_desk_tier_salaried = news_salaried.groupby(['tier']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_tier_salaried)
```

[181]:
```
        count_nonzero    median
tier
Tier 1         169.00 140387.17
Tier 2         209.00 105000.00
other           29.00  95780.00
Tier 3         131.00  86000.00
Tier 4          36.00  75000.00
```

[182]:
```
current_news_median_desk_tier_gender_salaried = news_salaried.
 ↪groupby(['tier','gender']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_news_median_desk_tier_gender_salaried)
```

[182]:

```
                  count_nonzero     median
tier    gender
Tier 1  Male              96.00  152115.94
        Female            73.00  135320.05
Tier 2  Male             112.00  112755.06
other   Male              16.00  102890.00
Tier 2  Female            97.00   99251.60
other   Female            13.00   95000.00
Tier 3  Male              56.00   90780.00
        Female            75.00   81999.88
Tier 4  Female            26.00   75000.00
        Male              10.00   74086.11
```

[183]:

```
current_news_median_desk_tier_race_salaried = news_salaried.
 ↪groupby(['tier','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_tier_race_salaried)
```

[183]:

```
                                                             count_nonzero  \
tier    race_ethnicity
Tier 1  White (United States of America)                            116.00
        Black or African American (United States of Ame...           11.00
        Asian (United States of America)                             15.00
Tier 2  White (United States of America)                            159.00
        Black or African American (United States of Ame...           16.00
other   White (United States of America)                             22.00
Tier 2  Asian (United States of America)                             14.00
        Hispanic or Latino (United States of America)                11.00
        Two or More Races (United States of America)                  6.00
Tier 3  White (United States of America)                             86.00
        Black or African American (United States of Ame...           16.00
        Hispanic or Latino (United States of America)                10.00
        Asian (United States of America)                             12.00
Tier 4  White (United States of America)                             23.00

                                                               median
tier    race_ethnicity
Tier 1  White (United States of America)                    159150.00
        Black or African American (United States of Ame...  140000.00
        Asian (United States of America)                    125780.00
Tier 2  White (United States of America)                    107170.81
        Black or African American (United States of Ame...  101702.73
other   White (United States of America)                    101390.00
Tier 2  Asian (United States of America)                     93835.10
        Hispanic or Latino (United States of America)        92080.00
        Two or More Races (United States of America)         89107.50
Tier 3  White (United States of America)                     88780.00
        Black or African American (United States of Ame...   85736.25
```

```
       Hispanic or Latino (United States of America)       81249.94
       Asian (United States of America)                    75500.00
Tier 4 White (United States of America)                    75000.00
```

[184]:
```python
current_news_median_desk_tier_race_gender_salaried = news_salaried.
 ↪groupby(['tier','race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_tier_race_gender_salaried)
```

[184]:
```
                                                                 count_nonzero
\
tier   race_ethnicity                                     gender
Tier 1 White (United States of America)                   Male           68.00
                                                          Female         48.00
       Black or African American (United States of Ame... Male            8.00
       Asian (United States of America)                   Female         10.00
                                                          Male            5.00
Tier 2 White (United States of America)                   Male           93.00
       Hispanic or Latino (United States of America)      Male            5.00
       Black or African American (United States of Ame... Male            7.00
other  White (United States of America)                   Male           12.00
Tier 2 White (United States of America)                   Female         66.00
       Black or African American (United States of Ame... Female          9.00
       Asian (United States of America)                   Female         10.00
Tier 3 Black or African American (United States of Ame... Male            7.00
       White (United States of America)                   Male           37.00
       Hispanic or Latino (United States of America)      Male            6.00
other  White (United States of America)                   Female         10.00
Tier 3 White (United States of America)                   Female         49.00
Tier 2 Hispanic or Latino (United States of America)      Female          6.00
Tier 3 Black or African American (United States of Ame... Female          9.00
       Asian (United States of America)                   Female         10.00
Tier 4 White (United States of America)                   Male            8.00
                                                          Female         15.00


                                                                     median
tier   race_ethnicity                                     gender
Tier 1 White (United States of America)                   Male    169870.29
                                                          Female 135824.85
       Black or African American (United States of Ame... Male    135390.00
       Asian (United States of America)                   Female 128430.00
                                                          Male    125000.00
Tier 2 White (United States of America)                   Male    117843.50
       Hispanic or Latino (United States of America)      Male    117780.00
       Black or African American (United States of Ame... Male    116349.15
other  White (United States of America)                   Male    115640.00
Tier 2 White (United States of America)                   Female 102423.86
       Black or African American (United States of Ame... Female  96147.48
```

```
       Asian (United States of America)                     Female  93835.10
Tier 3 Black or African American (United States of Ame... Male    93177.48
       White (United States of America)                     Male    92980.00
       Hispanic or Latino (United States of America)        Male    90390.04
other  White (United States of America)                     Female  86160.00
Tier 3 White (United States of America)                     Female  85780.00
Tier 2 Hispanic or Latino (United States of America)        Female  85372.54
Tier 3 Black or African American (United States of Ame... Female  85000.00
       Asian (United States of America)                     Female  75500.00
Tier 4 White (United States of America)                     Male    75500.00
                                                            Female  75000.00
```

[185]:
```python
current_news_median_desk_tier_race_group_gender_salaried = news_salaried.
 ↪groupby(['tier','race_grouping','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_desk_tier_race_group_gender_salaried)
```

[185]:
```
                                count_nonzero    median
tier   race_grouping   gender
Tier 1 white           Male             68.00 169870.29
       unknown         Male             14.00 137890.00
                       Female           10.00 137640.00
       white           Female           48.00 135824.85
       person of color Male             14.00 135390.00
                       Female           15.00 125780.00
Tier 2 white           Male             93.00 117843.50
other  white           Male             12.00 115640.00
Tier 2 person of color Male             19.00 105000.00
       white           Female           66.00 102423.86
       person of color Female           30.00  93020.07
Tier 3 white           Male             37.00  92980.00
       person of color Male             17.00  90000.08
other  white           Female           10.00  86160.00
Tier 3 white           Female           49.00  85780.00
Tier 4 person of color Female           10.00  78500.00
Tier 3 person of color Female           25.00  78000.00
Tier 4 white           Male              8.00  75500.00
                       Female           15.00  75000.00
```

[186]:
```python
current_news_median_desk_tier_race_gender_age5_salaried = news_salaried.
 ↪groupby(['tier','race_ethnicity','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_tier_race_gender_age5_salaried)
```

[186]:
```
                                                              count_nonzero  \
tier   race_ethnicity                    gender age_group_5
Tier 1 White (United States of America) Male   60-64                  5.00
                                               40-44                 13.00
                                        Female 45-49                  5.00
```

		Male	55-59	8.00
		Female	55-59	6.00
			40-44	5.00
Tier 2	White (United States of America)	Female	55-59	5.00
		Male	65+	6.00
			55-59	16.00
Tier 1	White (United States of America)	Male	35-39	15.00
		Female	50-54	7.00
		Male	30-34	13.00
Tier 2	White (United States of America)	Male	50-54	15.00
			35-39	13.00
		Female	60-64	6.00
Tier 1	White (United States of America)	Female	35-39	9.00
Tier 2	White (United States of America)	Male	60-64	6.00
Tier 1	White (United States of America)	Female	25-29	6.00
Tier 2	White (United States of America)	Female	50-54	10.00
Tier 3	White (United States of America)	Male	40-44	6.00
Tier 2	White (United States of America)	Male	40-44	11.00
Tier 3	White (United States of America)	Female	50-54	5.00
Tier 2	White (United States of America)	Male	45-49	10.00
		Female	30-34	11.00
			45-49	9.00
		Male	30-34	7.00
		Female	35-39	9.00
Tier 3	White (United States of America)	Male	35-39	6.00
Tier 2	White (United States of America)	Male	25-29	6.00
		Female	25-29	9.00
Tier 3	White (United States of America)	Female	35-39	7.00
			45-49	5.00
		Male	30-34	7.00
		Female	30-34	10.00
			55-59	5.00
		Male	25-29	6.00
	Asian (United States of America)	Female	25-29	6.00
	White (United States of America)	Female	25-29	11.00
Tier 4	White (United States of America)	Female	25-29	8.00

				median
tier	race_ethnicity	gender	age_group_5	
Tier 1	White (United States of America)	Male	60-64	174968.48
			40-44	170000.00
		Female	45-49	165000.00
		Male	55-59	162890.00
		Female	55-59	162854.23
			40-44	160000.00
Tier 2	White (United States of America)	Female	55-59	149029.98
		Male	65+	147473.21

```
                                                        55-59          147160.79
Tier 1 White (United States of America) Male    35-39          144755.00
                                         Female 50-54          134780.00
                                         Male   30-34          128780.00
Tier 2 White (United States of America) Male    50-54          128052.85
                                                35-39          124120.00
                                         Female 60-64          121896.57
Tier 1 White (United States of America) Female 35-39          120880.00
Tier 2 White (United States of America) Male   60-64          115891.66
Tier 1 White (United States of America) Female 25-29          112500.00
Tier 2 White (United States of America) Female 50-54          107773.24
Tier 3 White (United States of America) Male   40-44          106500.00
Tier 2 White (United States of America) Male   40-44          105000.00
Tier 3 White (United States of America) Female 50-54          103990.60
Tier 2 White (United States of America) Male   45-49          101260.30
                                         Female 30-34          100780.00
                                                45-49           99280.00
                                         Male   30-34           95655.73
                                         Female 35-39           95000.00
Tier 3 White (United States of America) Male   35-39           93030.00
Tier 2 White (United States of America) Male   25-29           91282.50
                                         Female 25-29           91000.00
Tier 3 White (United States of America) Female 35-39           90780.00
                                                45-49           90780.00
                                         Male   30-34           86000.00
                                         Female 30-34           84750.00
                                                55-59           81108.52
                                         Male   25-29           80250.00
       Asian (United States of America) Female 25-29           75500.00
       White (United States of America) Female 25-29           74780.00
Tier 4 White (United States of America) Female 25-29           69890.00
```

[187]:

```
current_news_median_desk_tier_race_group_gender_age5_salaried = news_salaried.
 ↪groupby(['tier','race_grouping','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_desk_tier_race_group_gender_age5_salaried)
```

[187]:

```
                                          count_nonzero    median
tier   race_grouping   gender age_group_5
Tier 1 white           Male   60-64                5.00 174968.48
                              40-44               13.00 170000.00
                       Female 45-49                5.00 165000.00
                       Male   55-59                8.00 162890.00
                       Female 55-59                6.00 162854.23
                              40-44                5.00 160000.00
Tier 2 white           Female 55-59                5.00 149029.98
                       Male   65+                  6.00 147473.21
                              55-59               16.00 147160.79
```

```
Tier 1 white           Male   35-39              15.00 144755.00
                       Female 50-54               7.00 134780.00
                       Male   30-34              13.00 128780.00
Tier 2 white           Male   50-54              15.00 128052.85
Tier 1 person of color Male   35-39               5.00 125000.00
Tier 2 white           Male   35-39              13.00 124120.00
                       Female 60-64               6.00 121896.57
Tier 1 white           Female 35-39               9.00 120880.00
       unknown         Male   30-34               6.00 120390.00
Tier 2 person of color Male   50-54               8.00 118932.52
       white           Male   60-64               6.00 115891.66
Tier 1 white           Female 25-29               6.00 112500.00
Tier 2 white           Female 50-54              10.00 107773.24
Tier 3 white           Male   40-44               6.00 106500.00
Tier 2 white           Male   40-44              11.00 105000.00
Tier 3 white           Female 50-54               5.00 103990.60
Tier 2 white           Male   45-49              10.00 101260.30
                       Female 30-34              11.00 100780.00
Tier 3 person of color Male   50-54               5.00  99931.09
Tier 2 white           Female 45-49               9.00  99280.00
                       Male   30-34               7.00  95655.73
                       Female 35-39               9.00  95000.00
Tier 3 white           Male   35-39               6.00  93030.00
Tier 2 person of color Female 35-39               5.00  91450.00
       white           Male   25-29               6.00  91282.50
                       Female 25-29               9.00  91000.00
Tier 3 white           Female 35-39               7.00  90780.00
                              45-49               5.00  90780.00
Tier 2 person of color Female 30-34               8.00  87548.85
Tier 3 white           Male   30-34               7.00  86000.00
                       Female 30-34              10.00  84750.00
       person of color Female 30-34               7.00  81999.88
       white           Female 55-59               5.00  81108.52
                       Male   25-29               6.00  80250.00
       person of color Female 25-29              11.00  77000.00
       white           Female 25-29              11.00  74780.00
Tier 4 white           Female 25-29               8.00  69890.00
```

1.5.7 Job profiles

[188]:
```
current_news_median_job_salaried = news_salaried.
 ↪groupby(['job_profile_current']).agg({'current_base_pay': [np.count_nonzero,␣
 ↪np.median]})
suppress_median(current_news_median_job_salaried)
```

[188]:
```
                                  count_nonzero    median
job_profile_current
```

```
300113 - Columnist                    19.00 170496.80
300313 - Columnist - Editorial         7.00 151896.27
320113 - Critic                        9.00 150962.35
330113 - Editorial Writer              7.00 129236.03
280212 - Staff Writer                306.00 124040.00
390510 - Graphics Editor               7.00 111071.00
360114 - Photographer                 16.00 106014.84
126902 - Topic Editor                  6.00 103771.73
390610 - Graphics Reporter             8.00  97280.00
120602 - Operations Editor             7.00  90780.00
280226 - Video Journalist             20.00  89240.00
390310 - Video Graphics Editor         8.00  87280.00
120202 - Assistant Editor             23.00  87000.00
390110 - Multiplatform Editor         53.00  83146.67
280228 - Designer                     29.00  76000.00
126202 - Photo Editor                  8.00  74961.88
390410 - Digital Video Editor         22.00  74500.00
289711 - News Intern - 2 Year          5.00  65780.00
```

[189]:
```
current_news_median_job_hourly = news_hourly.groupby(['job_profile_current']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_job_hourly)
```

[189]:
```
                                          count_nonzero  median
job_profile_current
280225 - Producer                                 18.00   36.74
400151 - Administrative Aide                       6.00   35.30
397110 - Multiplatform Editor (PT/PTOC)           23.00   34.72
380117 - Research Assistant                        6.00   31.23
410251 - Editorial Aide                           12.00   21.45
430117 - News Aide                                 8.00   17.06
440116 - Copy Aide                                 5.00   15.19
```

[190]:
```
current_news_median_job_gender_salaried = news_salaried.
 ↪groupby(['job_profile_current','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_job_gender_salaried)
```

[190]:
```
                                             count_nonzero    median
job_profile_current            gender
300113 - Columnist             Male                   8.00 175984.43
330113 - Editorial Writer      Male                   5.00 164899.53
320113 - Critic                Male                   5.00 160780.00
300113 - Columnist             Female                11.00 154780.00
300313 - Columnist - Editorial Male                   5.00 151896.27
280212 - Staff Writer          Male                 170.00 128439.57
                               Female               136.00 113474.07
390510 - Graphics Editor       Male                   5.00 111071.00
360114 - Photographer          Male                  11.00 109928.29
```

```
280226 - Video Journalist      Male           8.00  98555.00
390610 - Graphics Reporter     Female         5.00  95780.00
120202 - Assistant Editor      Male           9.00  93276.45
120602 - Operations Editor     Female         5.00  90780.00
280228 - Designer              Male          11.00  90280.00
360114 - Photographer          Female         5.00  88065.25
280226 - Video Journalist      Female        12.00  86000.00
390310 - Video Graphics Editor Male           5.00  85780.00
120202 - Assistant Editor      Female        14.00  85000.00
390110 - Multiplatform Editor  Male          26.00  84671.11
                               Female        27.00  82000.00
390410 - Digital Video Editor  Female        17.00  75000.00
                               Male           5.00  72080.00
280228 - Designer              Female        18.00  72000.00
```

[191]:
```
current_news_median_job_gender_hourly = news_hourly.
 ↪groupby(['job_profile_current','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_job_gender_hourly)
```

[191]:
```
                                                count_nonzero  median
job_profile_current                     gender
280225 - Producer                       Male             6.00   36.74
397110 - Multiplatform Editor (PT/PTOC) Female          14.00   36.54
280225 - Producer                       Female          12.00   36.35
400151 - Administrative Aide            Female           6.00   35.30
397110 - Multiplatform Editor (PT/PTOC) Male             9.00   33.41
380117 - Research Assistant             Female           5.00   31.68
410251 - Editorial Aide                 Female           8.00   21.45
```

[192]:
```
current_news_median_job_race_salaried = news_salaried.
 ↪groupby(['job_profile_current','race_ethnicity']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_salaried)
```

[192]:
```
   count_nonzero  \
job_profile_current            race_ethnicity
300313 - Columnist - Editorial White (United States of America)
6.00
300113 - Columnist             White (United States of America)
13.00
                               Black or African American (United States of
Ame...            5.00
320113 - Critic                White (United States of America)
8.00
330113 - Editorial Writer      White (United States of America)
6.00
280212 - Staff Writer          White (United States of America)
223.00
```

```
                               Black or African American (United States of
Ame...          18.00
                               Asian (United States of America)
24.00
390510 - Graphics Editor       White (United States of America)
5.00
360114 - Photographer          White (United States of America)
12.00
280226 - Video Journalist      White (United States of America)
13.00
120202 - Assistant Editor      White (United States of America)
16.00
390310 - Video Graphics Editor White (United States of America)
6.00
390110 - Multiplatform Editor  Black or African American (United States of
Ame...           5.00
280212 - Staff Writer          Hispanic or Latino (United States of America)
10.00
390110 - Multiplatform Editor  White (United States of America)
42.00
280228 - Designer              Hispanic or Latino (United States of America)
5.00
126202 - Photo Editor          White (United States of America)
6.00
280228 - Designer              White (United States of America)
16.00
390410 - Digital Video Editor  White (United States of America)
10.00

     median
job_profile_current            race_ethnicity
300313 - Columnist - Editorial White (United States of America)
190948.14
300113 - Columnist             White (United States of America)
176780.00
                               Black or African American (United States of
Ame... 153061.00
320113 - Critic                White (United States of America)
149371.17
330113 - Editorial Writer      White (United States of America)
127118.49
280212 - Staff Writer          White (United States of America)
125000.00
                               Black or African American (United States of
Ame... 122340.98
                               Asian (United States of America)
116892.50
```

```
390510 - Graphics Editor       White (United States of America)
111071.00
360114 - Photographer          White (United States of America)
106014.84
280226 - Video Journalist      White (United States of America)
103000.00
120202 - Assistant Editor      White (United States of America)
91280.02
390310 - Video Graphics Editor White (United States of America)
89780.00
390110 - Multiplatform Editor  Black or African American (United States of
Ame...   85692.50
280212 - Staff Writer          Hispanic or Latino (United States of America)
85372.54
390110 - Multiplatform Editor  White (United States of America)
83398.19
280228 - Designer              Hispanic or Latino (United States of America)
81999.88
126202 - Photo Editor          White (United States of America)
77070.00
280228 - Designer              White (United States of America)
75500.00
390410 - Digital Video Editor  White (United States of America)
71240.00
```

[193]:
```python
current_news_median_job_race_hourly = news_hourly.
 ↪groupby(['job_profile_current','race_ethnicity']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_hourly)
```

[193]:
```
            count_nonzero  \
job_profile_current                  race_ethnicity
280225 - Producer                    Black or African American (United States
of Ame...           5.00
                                     White (United States of America)
8.00
397110 - Multiplatform Editor (PT/PTOC) White (United States of America)
18.00
380117 - Research Assistant          White (United States of America)
5.00
410251 - Editorial Aide              White (United States of America)
7.00
430117 - News Aide                   White (United States of America)
5.00


            median
job_profile_current                  race_ethnicity
280225 - Producer                    Black or African American (United States
```

```
of Ame...   37.58
                                        White (United States of America)
35.91
397110 - Multiplatform Editor (PT/PTOC) White (United States of America)
34.80
380117 - Research Assistant             White (United States of America)
31.68
410251 - Editorial Aide                 White (United States of America)
21.12
430117 - News Aide                      White (United States of America)
16.50
```

[194]:

```
current_news_median_job_race_gender_salaried = news_salaried.
 ↪groupby(['job_profile_current','race_ethnicity','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_gender_salaried)
```

[194]:

```
         count_nonzero  \
job_profile_current           race_ethnicity
gender
300113 - Columnist            White (United States of America)
Female                7.00
 Male                  6.00
320113 - Critic               White (United States of America)
Male                  5.00
280212 - Staff Writer         White (United States of America)
Male                130.00
                              Black or African American (United States of Ame...
Male                 13.00
                              Asian (United States of America)
Male                  9.00
 Female               15.00
                              White (United States of America)
Female               93.00
360114 - Photographer         White (United States of America)
Male                  7.00
280212 - Staff Writer         Black or African American (United States of Ame...
Female                5.00
280226 - Video Journalist     White (United States of America)
Male                  6.00
120202 - Assistant Editor     White (United States of America)
Male                  8.00
280228 - Designer             White (United States of America)
Male                  5.00
360114 - Photographer         White (United States of America)
Female                5.00
280226 - Video Journalist     White (United States of America)
Female                7.00
```

```
120202 - Assistant Editor     White (United States of America)
Female          8.00
390110 - Multiplatform Editor White (United States of America)
Male           21.00
 Female         21.00
280212 - Staff Writer         Hispanic or Latino (United States of America)
Female          6.00
280228 - Designer             White (United States of America)
Female         11.00
390410 - Digital Video Editor White (United States of America)
Female          7.00

           median
job_profile_current           race_ethnicity
gender
300113 - Columnist            White (United States of America)
Female 224460.51
 Male   175984.43
320113 - Critic               White (United States of America)
Male   160780.00
280212 - Staff Writer         White (United States of America)
Male   129280.00
                              Black or African American (United States of Ame...
Male   125000.00
                              Asian (United States of America)
Male   118785.00
 Female 115000.00
                              White (United States of America)
Female 115000.00
360114 - Photographer         White (United States of America)
Male   113756.68
280212 - Staff Writer         Black or African American (United States of Ame...
Female 108864.49
280226 - Video Journalist     White (United States of America)
Male   106500.00
120202 - Assistant Editor     White (United States of America)
Male    92528.23
280228 - Designer             White (United States of America)
Male    90280.00
360114 - Photographer         White (United States of America)
Female  88065.25
280226 - Video Journalist     White (United States of America)
Female  88000.00
120202 - Assistant Editor     White (United States of America)
Female  87890.02
390110 - Multiplatform Editor White (United States of America)
Male    83649.71
```

 Female 83146.67
280212 - Staff Writer   Hispanic or Latino (United States of America)
Female 82890.00
280228 - Designer   White (United States of America)
Female 72000.00
390410 - Digital Video Editor White (United States of America)
Female 71500.00

[195]:
```python
current_news_median_job_race_gender_hourly = news_hourly.
 ↪groupby(['job_profile_current','race_ethnicity','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_gender_hourly)
```

[195]:
```
 count_nonzero  \
job_profile_current                      race_ethnicity                   gender
397110 - Multiplatform Editor (PT/PTOC) White (United States of America) Female
10.00
280225 - Producer                        White (United States of America) Female
5.00
397110 - Multiplatform Editor (PT/PTOC) White (United States of America) Male
8.00
410251 - Editorial Aide                  White (United States of America) Female
5.00

 median
job_profile_current                      race_ethnicity                   gender
397110 - Multiplatform Editor (PT/PTOC) White (United States of America) Female
39.87
280225 - Producer                        White (United States of America) Female
34.24
397110 - Multiplatform Editor (PT/PTOC) White (United States of America) Male
33.39
410251 - Editorial Aide                  White (United States of America) Female
21.12
```

[196]:
```python
current_news_median_job_race_group_gender_salaried = news_salaried.
 ↪groupby(['desk','race_grouping','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_news_median_job_race_group_gender_salaried)
```

[196]:

desk	race_grouping	gender	count_nonzero	median
National	white	Male	46.00	175374.24
Financial	white	Male	21.00	140387.17
Editorial	white	Male	16.00	140271.26
Foreign	unknown	Male	11.00	140000.00
National	white	Female	38.00	139733.72
Foreign	unknown	Female	9.00	135000.00
National	person of color	Female	10.00	132780.00

```
Sports                 white          Female          6.00 132014.99
National               person of color Male          11.00 130780.00
Financial              white          Female          8.00 130390.00
                       person of color Female         5.00 121140.00
Local                  white          Male           25.00 119553.20
non-newsroom           white          Male           12.00 115640.00
Style                  white          Male           18.00 115036.81
                                      Female         20.00 109841.38
Design                 white          Male           12.00 103330.48
Graphics               white          Male            5.00 102780.00
Editorial              white          Female         11.00 102234.81
Local                  person of color Male           6.00 101674.57
                       white          Female         21.00 100780.00
Sports                 white          Male           24.00  98393.66
Style                  person of color Female         5.00  96147.48
Local                  person of color Female        13.00  91450.00
Design                 person of color Male          11.00  90780.00
Video                  white          Male           13.00  90780.00
Multiplatform          white          Male            9.00  88151.74
non-newsroom           white          Female         10.00  86160.00
Video                  white          Female         15.00  86000.00
Multiplatform          white          Female         13.00  84780.00
Design                 white          Female         15.00  79140.00
Emerging News Products person of color Female         8.00  78500.00
Video                  person of color Female        12.00  76390.00
Emerging News Products white          Male            7.00  75000.00
                                      Female         13.00  75000.00
Design                 person of color Female         6.00  73500.00
```

[197]:

```
current_news_median_job_race_group_gender_hourly = news_hourly.
 ↪groupby(['job_profile_current','race_grouping','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_group_gender_hourly)
```

[197]:

```
                                                                count_nonzero  \
job_profile_current                     race_grouping   gender
397110 - Multiplatform Editor (PT/PTOC) white           Female          10.00
280225 - Producer                       person of color Female           6.00
                                        white           Female           5.00
397110 - Multiplatform Editor (PT/PTOC) white           Male             8.00
410251 - Editorial Aide                 white           Female           5.00


                                                                median
job_profile_current                     race_grouping   gender
397110 - Multiplatform Editor (PT/PTOC) white           Female   39.87
280225 - Producer                       person of color Female   35.90
                                        white           Female   34.24
397110 - Multiplatform Editor (PT/PTOC) white           Male     33.39
```

```
410251 - Editorial Aide                  white           Female   21.12
```

[198]:
```python
current_news_median_job_race_gender_age5_salaried = news_salaried.
 ↪groupby(['job_profile_current','race_ethnicity','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_gender_age5_salaried)
```

[198]:
```
   count_nonzero  \
job_profile_current           race_ethnicity                   gender
age_group_5
280212 - Staff Writer         White (United States of America) Male   65+
5.00
                                                                      55-59
17.00
                                                               Female 55-59
7.00
                                                                      45-49
10.00
                                                                      40-44
9.00
                                                               Male   60-64
11.00
                                                                      40-44
20.00
                                                                      50-54
14.00
                                                                      45-49
9.00
                                                               Female 60-64
6.00
                                                               Male   35-39
25.00
                              Asian (United States of America) Female 30-34
5.00
                              White (United States of America) Female 50-54
11.00
                                                               Male   30-34
21.00
                                                               Female 35-39
17.00
390110 - Multiplatform Editor White (United States of America) Female 50-54
5.00
280212 - Staff Writer         White (United States of America) Female 30-34
13.00
                                                                      25-29
14.00
390110 - Multiplatform Editor White (United States of America) Male   45-49
5.00
```

```
120202 - Assistant Editor     White (United States of America) Female 25-29
5.00
280212 - Staff Writer         White (United States of America) Male   25-29
6.00
390110 - Multiplatform Editor White (United States of America) Male   30-34
5.00
                                                                      25-29
5.00
                                                               Female 25-29
5.00

     median
job_profile_current           race_ethnicity                   gender
age_group_5
280212 - Staff Writer         White (United States of America) Male   65+
159458.37
                                                                      55-59
153922.58
                                                               Female 55-59
153780.00
                                                                      45-49
144559.75
                                                                      40-44
140000.00
                                                               Male   60-64
134957.37
                                                                      40-44
132980.42
                                                                      50-54
132273.46
                                                                      45-49
130845.00
                                                               Female 60-64
128441.42
                                                               Male   35-39
126280.00
                              Asian (United States of America) Female 30-34
125000.00
                              White (United States of America) Female 50-54
125000.00
                                                               Male   30-34
121280.00
                                                               Female 35-39
105000.00
390110 - Multiplatform Editor White (United States of America) Female 50-54
102234.81
280212 - Staff Writer         White (United States of America) Female 30-34
```

```
100780.00
                                                                                25-29
91030.00
390110 - Multiplatform Editor White (United States of America) Male   45-49
90090.00
120202 - Assistant Editor     White (United States of America) Female 25-29
84280.00
280212 - Staff Writer         White (United States of America) Male   25-29
78208.20
390110 - Multiplatform Editor White (United States of America) Male   30-34
76055.50
                                                                      25-29
71500.00
                                                               Female 25-29
68421.60
```

[199]:
```python
current_news_median_job_race_gender_age5_hourly = news_hourly.
 ↪groupby(['job_profile_current','race_ethnicity','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_gender_age5_hourly)
```

[199]:
```
Empty DataFrame
Columns: [count_nonzero, median]
Index: []
```

[200]:
```python
current_news_median_job_race_group_gender_age5_salaried = news_salaried.
 ↪groupby(['job_profile_current','race_grouping','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_group_gender_age5_salaried)
```

[200]:
```
                                                                count_nonzero
\
job_profile_current          race_grouping   gender age_group_5
280212 - Staff Writer        white           Male   65+                  5.00
                                                    55-59               17.00
                                             Female 55-59                7.00
                                                    45-49               10.00
                                                    40-44                9.00
                                             Male   60-64               11.00
                                                    40-44               20.00
                                                    50-54               14.00
                                                    45-49                9.00
                                             Female 60-64                6.00
                                             Male   35-39               25.00
                             person of color Male   35-39                7.00
                             white           Female 50-54               11.00
                             person of color Male   50-54                6.00
                             white           Male   30-34               21.00
                             unknown         Male   30-34                6.00
```

	white	Female	35-39	17.00
390110 - Multiplatform Editor	white	Female	50-54	5.00
280212 - Staff Writer	white	Female	30-34	13.00
	person of color	Female	35-39	7.00
	white	Female	25-29	14.00
390110 - Multiplatform Editor	white	Male	45-49	5.00
280212 - Staff Writer	person of color	Female	30-34	10.00
120202 - Assistant Editor	white	Female	25-29	5.00
280212 - Staff Writer	white	Male	25-29	6.00
390110 - Multiplatform Editor	white	Male	30-34	5.00
390410 - Digital Video Editor	person of color	Female	25-29	6.00
390110 - Multiplatform Editor	white	Male	25-29	5.00
		Female	25-29	5.00

				median
job_profile_current	race_grouping	gender	age_group_5	
280212 - Staff Writer	white	Male	65+	159458.37
			55-59	153922.58
		Female	55-59	153780.00
			45-49	144559.75
			40-44	140000.00
		Male	60-64	134957.37
			40-44	132980.42
			50-54	132273.46
			45-49	130845.00
		Female	60-64	128441.42
		Male	35-39	126280.00
	person of color	Male	35-39	125000.00
	white	Female	50-54	125000.00
	person of color	Male	50-54	124140.35
	white	Male	30-34	121280.00
	unknown	Male	30-34	120390.00
	white	Female	35-39	105000.00
390110 - Multiplatform Editor	white	Female	50-54	102234.81
280212 - Staff Writer	white	Female	30-34	100780.00
	person of color	Female	35-39	99238.50
	white	Female	25-29	91030.00
390110 - Multiplatform Editor	white	Male	45-49	90090.00
280212 - Staff Writer	person of color	Female	30-34	85372.54
120202 - Assistant Editor	white	Female	25-29	84280.00
280212 - Staff Writer	white	Male	25-29	78208.20
390110 - Multiplatform Editor	white	Male	30-34	76055.50
390410 - Digital Video Editor	person of color	Female	25-29	75390.00
390110 - Multiplatform Editor	white	Male	25-29	71500.00
		Female	25-29	68421.60

[201]:
```
current_news_median_job_race_group_gender_age5_hourly = news_hourly.
↪groupby(['job_profile_current','race_grouping','gender','age_group_5']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_news_median_job_race_group_gender_age5_hourly)
```

[201]:
```
Empty DataFrame
Columns: [count_nonzero, median]
Index: []
```

1.5.8 Performance evaluations

[202]:
```
news_ratings = ratings_combined[ratings_combined['dept'] == 'News']
```

[203]:
```
news_ratings_gender = news_ratings.groupby(['gender']).
↪agg({'performance_rating': [np.count_nonzero, np.median]})
suppress_median(news_ratings_gender)
```

[203]:
```
        count_nonzero  median
gender
Female        1892.00    3.40
Male          1772.00    3.40
```

[204]:
```
news_ratings_race = news_ratings.groupby(['race_ethnicity']).
↪agg({'performance_rating': [np.count_nonzero, np.median]})
suppress_median(news_ratings_race)
```

[204]:
```
                                                    count_nonzero  median
race_ethnicity
American Indian or Alaska Native (United States...          12.00    3.60
White (United States of America)                          2516.00    3.50
Asian (United States of America)                           324.00    3.40
Prefer Not to Disclose (United States of America)           56.00    3.40
Black or African American (United States of Ame...         416.00    3.30
Hispanic or Latino (United States of America)              164.00    3.30
Native Hawaiian or Other Pacific Islander (Unit...           8.00    3.30
Two or More Races (United States of America)                80.00    3.20
```

[205]:
```
news_ratings_race_gender = news_ratings.groupby(['race_ethnicity','gender']).
↪agg({'performance_rating': [np.count_nonzero, np.median]})
suppress(news_ratings_race_gender)
```

[205]:
```
                                                           count_nonzero  \
race_ethnicity                                     gender
American Indian or Alaska Native (United States... Female           8.00
Asian (United States of America)                   Female         232.00
                                                   Male            92.00
Black or African American (United States of Ame... Female         224.00
                                                   Male           192.00
Hispanic or Latino (United States of America)      Female          80.00
                                                   Male            84.00
```

```
Native Hawaiian or Other Pacific Islander (Unit... Male           8.00
Prefer Not to Disclose (United States of America)  Female        24.00
                                                   Male          32.00
Two or More Races (United States of America)       Female        52.00
                                                   Male          28.00
White (United States of America)                   Female      1228.00
                                                   Male        1288.00


                                                          median
race_ethnicity                                     gender
American Indian or Alaska Native (United States... Female    3.70
Asian (United States of America)                   Female    3.40
                                                   Male      3.40
Black or African American (United States of Ame... Female    3.25
                                                   Male      3.30
Hispanic or Latino (United States of America)      Female    3.30
                                                   Male      3.30
Native Hawaiian or Other Pacific Islander (Unit... Male      3.30
Prefer Not to Disclose (United States of America)  Female    3.50
                                                   Male      3.30
Two or More Races (United States of America)       Female    3.20
                                                   Male      3.20
White (United States of America)                   Female    3.40
                                                   Male      3.50
```

[206]:
```
news_ratings_race_gender_under3 =␣
 ↪news_ratings[news_ratings['performance_rating'] < 3.1].
 ↪groupby(['race_grouping','gender']).agg({'performance_rating': [np.
 ↪count_nonzero, np.median]})
suppress(news_ratings_race_gender_under3)
```

[206]:
```
                        count_nonzero  median
race_grouping   gender
person of color Female          57.00    3.00
                Male            49.00    3.00
white           Female          92.00    3.00
                Male            80.00    3.00
```

[207]:
```
news_ratings_race_gender_over4 =␣
 ↪news_ratings[news_ratings['performance_rating'] > 3.9].
 ↪groupby(['race_grouping','gender']).agg({'performance_rating': [np.
 ↪count_nonzero, np.median]})
suppress(news_ratings_race_gender_over4)
```

[207]:
```
                        count_nonzero  median
race_grouping   gender
person of color Female          13.00    4.10
                Male             5.00    4.10
unknown         Female           5.00    4.10
```

```
                Male          10.00     4.05
white           Female        67.00     4.10
                Male         114.00     4.20
```

1.5.9 Pay changes

[208]:
```
news_change = reason_for_change_combined[reason_for_change_combined['dept'] ==␣
↪'News']
```

[209]:
```
news_change_gender = news_change.groupby(['business_process_reason','gender']).
↪agg({'business_process_reason': [np.count_nonzero]})
suppress_count(news_change_gender)
```

[209]:
```
                                                            count_nonzero
business_process_reason                             gender
Request Compensation Change > Adjustment > Cont... Male             813
                                                    Female           809
Merit > Performance > Annual Performance Appraisal Male             623
                                                    Female           583
Data Change > Data Change > Change Job Details     Female           282
                                                    Male             245
Transfer > Transfer > Move to another Manager      Male             185
Request Compensation Change > Adjustment > Mark... Female           169
                                                    Male             131
Transfer > Transfer > Move to another Manager      Female           111
Request Compensation Change > Adjustment > Chan... Female            90
Promotion > Promotion > Promotion                  Female            84
                                                    Male              79
Hire Employee > New Hire > New Position            Female            78
Hire Employee > New Hire > Fill Vacancy            Female            70
Request Compensation Change > Adjustment > Chan... Male              62
Hire Employee > New Hire > New Position            Male              58
Hire Employee > New Hire > Fill Vacancy            Male              55
Transfer > Transfer > Transfer between departments Female            27
Request Compensation Change > Adjustment > Incr... Male              26
Request Compensation Change > Adjustment > Job ... Female            24
Transfer > Transfer > Transfer between departments Male              24
Request Compensation Change > Adjustment > Job ... Male              22
Request Compensation Change > Adjustment > Incr... Female            20
Request Compensation Change > Adjustment > Perf... Male              14
                                                    Female            11
Hire Employee > Rehire > New Position              Female             6
```

[210]:
```
news_change_race = news_change.
↪groupby(['business_process_reason','race_ethnicity']).
↪agg({'business_process_reason': [np.count_nonzero]})
suppress_count(news_change_race)
```

[210]:
```
                        count_nonzero
business_process_reason                                 race_ethnicity
Request Compensation Change > Adjustment > Cont... White (United States of
America)                                    1164
Merit > Performance > Annual Performance Appraisal White (United States of
America)                                     889
Data Change > Data Change > Change Job Details     White (United States of
America)                                     345
Transfer > Transfer > Move to another Manager      White (United States of
America)                                     201
Request Compensation Change > Adjustment > Mark... White (United States of
America)                                     198
Request Compensation Change > Adjustment > Cont... Black or African American
(United States of Ame...                   169
                                                   Asian (United States of
America)                                     138
Merit > Performance > Annual Performance Appraisal Black or African American
(United States of Ame...                   108
                                                   Asian (United States of
America)                                     106
Promotion > Promotion > Promotion                  White (United States of
America)                                     104
Hire Employee > New Hire > New Position            White (United States of
America)                                      93
Request Compensation Change > Adjustment > Chan... White (United States of
America)                                      87
Hire Employee > New Hire > Fill Vacancy            White (United States of
America)                                      77
Request Compensation Change > Adjustment > Cont... Hispanic or Latino (United
States of America)                          71
Data Change > Data Change > Change Job Details     Black or African American
(United States of Ame...                    55
                                                   Asian (United States of
America)                                      54
Transfer > Transfer > Move to another Manager      Black or African American
(United States of Ame...                    52
Merit > Performance > Annual Performance Appraisal Hispanic or Latino (United
States of America)                          46
Transfer > Transfer > Transfer between departments White (United States of
America)                                      40
Request Compensation Change > Adjustment > Incr... White (United States of
America)                                      34
Request Compensation Change > Adjustment > Mark... Asian (United States of
America)                                      31
Request Compensation Change > Adjustment > Job ... White (United States of
America)                                      31
Request Compensation Change > Adjustment > Mark... Black or African American
```

```
(United States of Ame...            27
Data Change > Data Change > Change Job Details     Hispanic or Latino (United
States of America)                 26
Promotion > Promotion > Promotion                  Asian (United States of
America)                              21
Request Compensation Change > Adjustment > Cont... Two or More Races (United
States of America)                  20
Request Compensation Change > Adjustment > Perf... White (United States of
America)                              20
Request Compensation Change > Adjustment > Mark... Hispanic or Latino (United
States of America)                 19
Promotion > Promotion > Promotion                  Black or African American
(United States of Ame...            19
Request Compensation Change > Adjustment > Chan... Black or African American
(United States of Ame...            18
Hire Employee > New Hire > Fill Vacancy            Black or African American
(United States of Ame...            17
Transfer > Transfer > Move to another Manager      Asian (United States of
America)                              16
Hire Employee > New Hire > New Position            Asian (United States of
America)                              14
                                                   Black or African American
(United States of Ame...            12
Transfer > Transfer > Move to another Manager      Hispanic or Latino (United
States of America)                 11
Request Compensation Change > Adjustment > Chan... Asian (United States of
America)                              11
Hire Employee > New Hire > Fill Vacancy            Asian (United States of
America)                              10
Merit > Performance > Annual Performance Appraisal Two or More Races (United
States of America)                   9
Request Compensation Change > Adjustment > Cont... American Indian or Alaska
Native (United States...             8
Request Compensation Change > Adjustment > Mark... Two or More Races (United
States of America)                   8
Hire Employee > New Hire > Fill Vacancy            Hispanic or Latino (United
States of America)                  7
Merit > Performance > Annual Performance Appraisal Prefer Not to Disclose
(United States of America)             7
Promotion > Promotion > Promotion                  Hispanic or Latino (United
States of America)                  7
Hire Employee > New Hire > Fill Vacancy            Two or More Races (United
States of America)                   6
Data Change > Data Change > Change Job Details     Two or More Races (United
States of America)                   6
Transfer > Transfer > Transfer between departments Asian (United States of
America)                               6
```

```
Merit > Performance > Annual Performance Appraisal American Indian or Alaska
Native (United States...                      6
Request Compensation Change > Adjustment > Job ... Asian (United States of
America)                                          6
Hire Employee > New Hire > Fill Vacancy            Prefer Not to Disclose
(United States of America)                        6
Request Compensation Change > Adjustment > Chan... Hispanic or Latino (United
States of America)                            5
Request Compensation Change > Adjustment > Cont... Prefer Not to Disclose
(United States of America)                        5
Hire Employee > New Hire > New Position            Two or More Races (United
States of America)                             5
                                                   Hispanic or Latino (United
States of America)                            5
Promotion > Promotion > Promotion                  Two or More Races (United
States of America)                             5
```

1.5.10 Performance evaluations x merit raises

[211]:
```python
reason_for_change_combined['merit_raises'] =␣
↪reason_for_change_combined['business_process_reason'].str.contains('Merit',␣
↪re.IGNORECASE)
```

[212]:
```python
twenty14 = np.datetime64('2016-04-01')
twenty15 = np.datetime64('2017-04-01')
twenty16 = np.datetime64('2018-04-01')
twenty17 = np.datetime64('2019-04-01')
twenty18 = np.datetime64('2020-04-01')

def raise_time(row):
    if row['effective_date'] < twenty14:
        return 'before 2015'
    if row['effective_date'] < twenty15:
        return '2015'
    if row['effective_date'] < twenty16:
        return '2016'
    if row['effective_date'] < twenty17:
        return '2017'
    if row['effective_date'] < twenty18:
        return '2018'
    return 'unknown'

reason_for_change_combined['raise_after'] = reason_for_change_combined.
↪apply(lambda row: raise_time(row), axis=1)
```

[213]:

```
merit_raises_news_gender_salaried =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried')].
↪groupby(['gender']).agg({'base_pay_change': [np.count_nonzero, np.median]})
suppress(merit_raises_news_gender_salaried)
```

[213]:

```
        count_nonzero  median
gender
Female         431.00 3000.00
Male           494.00 3000.00
```

[214]:

```
merit_raises_news_gender_hourly =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Hourly')].
↪groupby(['gender']).agg({'base_pay_change': [np.count_nonzero, np.median]})
suppress(merit_raises_news_gender_hourly)
```

[214]:

```
        count_nonzero  median
gender
Female          78.00    1.27
Male            51.00    1.03
```

[215]:

```
merit_raises_news_race_salaried =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried')].
↪groupby(['race_ethnicity']).agg({'base_pay_change': [np.count_nonzero, np.
↪median]})
suppress_median(merit_raises_news_race_salaried)
```

[215]:

```
                                                    count_nonzero  median
race_ethnicity
American Indian or Alaska Native (United States...           5.00 3500.00
Two or More Races (United States of America)                 7.00 3500.00
Asian (United States of America)                            69.00 3000.00
Black or African American (United States of Ame...          82.00 3000.00
White (United States of America)                           707.00 3000.00
Hispanic or Latino (United States of America)               36.00 2500.00
```

[216]:

```
merit_raises_news_race_hourly =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Hourly')].
↪groupby(['race_ethnicity']).agg({'base_pay_change': [np.count_nonzero, np.
↪median]})
suppress_median(merit_raises_news_race_hourly)
```

[216]:
```
                                                    count_nonzero  median
race_ethnicity
White (United States of America)                            91.00    1.28
Black or African American (United States of Ame...          16.00    1.25
Asian (United States of America)                            18.00    1.03
```

[217]:
```
merit_raises_news_race_group_salaried =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried')].
↪groupby(['race_grouping']).agg({'base_pay_change': [np.count_nonzero, np.
↪median]})
suppress_median(merit_raises_news_race_group_salaried)
```

[217]:
```
                 count_nonzero  median
race_grouping
person of color         200.00 3000.00
white                   707.00 3000.00
unknown                  18.00 2860.00
```

[218]:
```
merit_raises_news_race_group_hourly =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Hourly')].
↪groupby(['race_grouping']).agg({'base_pay_change': [np.count_nonzero, np.
↪median]})
suppress_median(merit_raises_news_race_group_hourly)
```

[218]:
```
                 count_nonzero  median
race_grouping
white                    91.00    1.28
person of color          38.00    1.03
```

[219]:
```
merit_raises_news_gender_race_group_salaried =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]})
suppress_median(merit_raises_news_gender_race_group_salaried)
```

[219]:
```
                        count_nonzero  median
gender race_grouping
Female unknown                  10.00 3500.00
       person of color         112.00 3000.00
       white                   309.00 3000.00
Male   white                   398.00 3000.00
       person of color          88.00 2900.00
       unknown                   8.00 2457.50
```

[220]:
```
merit_raises_news_gender_race_group_hourly =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Hourly')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]})
suppress_median(merit_raises_news_gender_race_group_hourly)
```

[220]:
```
                              count_nonzero  median
gender race_grouping
Female white                          59.00    1.28
       person of color                19.00    1.26
Male   person of color                19.00    1.03
       white                          32.00    1.02
```

[221]:
```
fifteen_raises_amount =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2015')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]},{'2015_annual_performance_rating': [np.
↪count_nonzero, np.median]})
suppress(fifteen_raises_amount)
```

[221]:
```
                              count_nonzero  median
gender race_grouping
Female person of color                17.00 2888.00
       white                          44.00 2500.00
Male   person of color                10.00 2162.50
       white                          64.00 3000.00
```

[222]:
```
fifteen_raises_score =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2015')].
↪groupby(['gender','race_grouping']).agg({'2015_annual_performance_rating':␣
↪[np.count_nonzero, np.median]})
suppress(fifteen_raises_score)
```

[222]:
```
                              count_nonzero  median
gender race_grouping
Female person of color                17.00    3.40
       white                          44.00    3.70
Male   person of color                10.00    3.50
       white                          64.00    3.65
```

[223]:

```
sixteen_raises_amount =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2016')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]},{'2016_annual_performance_rating': [np.
↪count_nonzero, np.median]})
suppress(sixteen_raises_amount)
```

[223]:

```
                             count_nonzero  median
gender race_grouping
Female person of color               26.00 3000.00
       white                         60.00 3000.00
Male   person of color               17.00 3000.00
       white                         81.00 3000.00
```

[224]:

```
sixteen_raises_score =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2016')].
↪groupby(['gender','race_grouping']).agg({'2016_annual_performance_rating':␣
↪[np.count_nonzero, np.median]})
suppress(sixteen_raises_score)
```

[224]:

```
                             count_nonzero  median
gender race_grouping
Female person of color               26.00    3.40
       white                         60.00    3.50
Male   person of color               17.00    3.40
       white                         81.00    3.60
```

[225]:

```
seventeen_raises_amount =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2017')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]},{'2017_annual_performance_rating': [np.
↪count_nonzero, np.median]})
suppress(seventeen_raises_amount)
```

[225]:

```
                             count_nonzero  median
gender race_grouping
Female person of color               25.00 3000.00
       white                         59.00 2500.00
Male   person of color               25.00 3000.00
       white                         89.00 3000.00
```

[226]:
```
seventeen_raises_score =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2017')].
↪groupby(['gender','race_grouping']).agg({'2017_annual_performance_rating':␣
↪[np.count_nonzero, np.median]})
suppress(seventeen_raises_score)
```

[226]:
```
                              count_nonzero  median
gender race_grouping
Female person of color                25.00    3.50
       white                          59.00    3.40
Male   person of color                25.00    3.40
       white                          89.00    3.60
```

[227]:
```
eighteen_raises_amount =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2018')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]},{'2018_annual_performance_rating': [np.
↪count_nonzero, np.median]})
suppress(eighteen_raises_amount)
```

[227]:
```
                              count_nonzero  median
gender race_grouping
Female person of color                28.00 3000.00
       white                         104.00 3000.00
Male   person of color                26.00 2500.00
       white                         120.00 3000.00
```

[228]:
```
eighteen_raises_score =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'News') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2018')].
↪groupby(['gender','race_grouping']).agg({'2018_annual_performance_rating':␣
↪[np.count_nonzero, np.median]})
suppress(eighteen_raises_score)
```

[228]:
```
                              count_nonzero  median
gender race_grouping
Female person of color                28.00    3.50
       white                         104.00    3.50
Male   person of color                26.00    3.40
       white                         120.00    3.60
```

[229]:
```
merit_raises_15 =␣
 ↪reason_for_change_combined[(reason_for_change_combined['raise_after'] ==␣
 ↪'2015') & (reason_for_change_combined['merit_raises'] == True)]
merit_raises_16 =␣
 ↪reason_for_change_combined[(reason_for_change_combined['raise_after'] ==␣
 ↪'2016') & (reason_for_change_combined['merit_raises'] == True)]
merit_raises_17 =␣
 ↪reason_for_change_combined[(reason_for_change_combined['raise_after'] ==␣
 ↪'2017') & (reason_for_change_combined['merit_raises'] == True)]
merit_raises_18 =␣
 ↪reason_for_change_combined[(reason_for_change_combined['raise_after'] ==␣
 ↪'2018') & (reason_for_change_combined['merit_raises'] == True)]

merit_raises_15 =␣
 ↪merit_raises_15[['base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping
 ↪rename(columns={'2015_annual_performance_rating':'performance_rating'})
merit_raises_16 =␣
 ↪merit_raises_16[['base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping
 ↪rename(columns={'2016_annual_performance_rating':'performance_rating'})
merit_raises_17 =␣
 ↪merit_raises_17[['base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping
 ↪rename(columns={'2017_annual_performance_rating':'performance_rating'})
merit_raises_18 =␣
 ↪merit_raises_18[['base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping
 ↪rename(columns={'2018_annual_performance_rating':'performance_rating'})

merit_raises_15 = pd.DataFrame(merit_raises_15)
merit_raises_16 = pd.DataFrame(merit_raises_16)
merit_raises_17 = pd.DataFrame(merit_raises_17)
merit_raises_18 = pd.DataFrame(merit_raises_18)

merit_raises_combined = pd.
 ↪concat([merit_raises_15,merit_raises_16,merit_raises_17,merit_raises_18])
```

[230]:
```
news_salaried_raises =␣
 ↪merit_raises_combined[(merit_raises_combined['pay_rate_type'] == 'Salaried')␣
 ↪& (merit_raises_combined['dept'] == 'News')].
 ↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
 ↪count_nonzero, np.median]})
suppress(news_salaried_raises)
```

[230]:
```
                              count_nonzero  median
gender race_grouping
Female person of color                96.00 3000.00
       unknown                         9.00 3000.00
       white                         267.00 3000.00
Male   person of color                78.00 2658.52
```

```
        unknown                       7.00 2500.00
        white                       354.00 3000.00
```

[231]:
```
news_salaried_raises_scores =␣
↪merit_raises_combined[(merit_raises_combined['pay_rate_type'] == 'Salaried')␣
↪& (merit_raises_combined['dept'] == 'News')].
↪groupby(['gender','race_grouping']).agg({'performance_rating': [np.
↪count_nonzero, np.median]})
suppress(news_salaried_raises_scores)
```

[231]:
```
                           count_nonzero  median
gender race_grouping
Female person of color             96.00    3.40
       unknown                      9.00    3.90
       white                      267.00    3.50
Male   person of color             78.00    3.40
       unknown                      7.00    3.70
       white                      354.00    3.60
```

[232]:
```
news_hourly_raises =␣
↪merit_raises_combined[(merit_raises_combined['pay_rate_type'] == 'Hourly') &␣
↪(merit_raises_combined['dept'] == 'News')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]})
suppress(news_hourly_raises)
```

[232]:
```
                           count_nonzero  median
gender race_grouping
Female person of color             18.00    1.27
       white                       54.00    1.46
Male   person of color             19.00    1.03
       white                       28.00    1.16
```

[233]:
```
news_hourly_raises_scores =␣
↪merit_raises_combined[(merit_raises_combined['pay_rate_type'] == 'Hourly') &␣
↪(merit_raises_combined['dept'] == 'News')].
↪groupby(['gender','race_grouping']).agg({'performance_rating': [np.
↪count_nonzero, np.median]})
suppress(news_hourly_raises_scores)
```

[233]:
```
                           count_nonzero  median
gender race_grouping
Female person of color             18.00    3.40
       white                       54.00    3.50
Male   person of color             19.00    3.40
       white                       28.00    3.60
```

1.5.11 Era

[234]:
```
bezos = df[(df['hire_date'] > '2013-10-04') & (df['dept'] == 'News') &␣
↪(df['pay_rate_type'] == 'Salaried')]
graham = df[(df['hire_date'] < '2013-10-05') & (df['dept'] == 'News') &␣
↪(df['pay_rate_type'] == 'Salaried')]
```

[235]:
```
bezos_gender = bezos.groupby(['gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress_median(bezos_gender)
```

[235]:
```
        count_nonzero     median
gender
Male           157.00 100780.00
Female         180.00  87160.00
```

[236]:
```
graham_gender = graham.groupby(['gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress_median(graham_gender)
```

[236]:
```
        count_nonzero     median
gender
Male           133.00 127059.40
Female         104.00 112136.48
```

[237]:
```
bezos_race = bezos.groupby(['race_ethnicity']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress_median(bezos_race)
```

[237]:
```
                                                    count_nonzero    median
race_ethnicity
Black or African American (United States of Ame...          26.00 94963.74
White (United States of America)                           224.00 94519.11
Asian (United States of America)                            31.00 87000.00
Prefer Not to Disclose (United States of America)            8.00 82140.00
Hispanic or Latino (United States of America)               22.00 81249.94
Two or More Races (United States of America)                14.00 79860.00
```

[238]:
```
graham_race = graham.groupby(['race_ethnicity']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress_median(graham_race)
```

[238]:
```
                                                    count_nonzero     median
race_ethnicity
Hispanic or Latino (United States of America)                6.00 135272.46
White (United States of America)                           182.00 124500.00
Asian (United States of America)                            15.00 111761.01
Black or African American (United States of Ame...          22.00 104397.79
```

[239]:
```
bezos_race_group = bezos.groupby(['race_grouping']).agg({'current_base_pay':␣
↪[np.count_nonzero, np.median]})
```

```
suppress_median(bezos_race_group)
```

[239]:

```
                   count_nonzero    median
race_grouping
unknown                    20.00 113890.00
white                     224.00  94519.11
person of color            93.00  86000.00
```

[240]:

```
graham_race_group = graham.groupby(['race_grouping']).agg({'current_base_pay':␣
↪[np.count_nonzero, np.median]})
suppress_median(graham_race_group)
```

[240]:

```
                   count_nonzero    median
race_grouping
unknown                     9.00 151170.88
white                     182.00 124500.00
person of color            46.00 110844.65
```

[241]:

```
bezos_gender_race_group = bezos.groupby(['race_grouping','gender']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(bezos_gender_race_group)
```

[241]:

```
                          count_nonzero    median
race_grouping   gender
unknown         Male              10.00 121390.00
                Female            10.00 109000.00
white           Male             115.00 102780.00
person of color Male              32.00  94026.24
white           Female           109.00  88780.00
person of color Female            61.00  82000.00
```

[242]:

```
graham_gender_race_group = graham.groupby(['race_grouping','gender']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(graham_gender_race_group)
```

[242]:

```
                          count_nonzero    median
race_grouping   gender
unknown         Male               6.00 150975.44
white           Male             103.00 128629.42
person of color Male              24.00 117567.07
white           Female            79.00 112511.94
person of color Female            22.00 108594.26
```

[243]:

```
bezos_gender_race_group_age5 = bezos.
↪groupby(['race_grouping','gender','age_group_5']).agg({'current_base_pay':␣
↪[np.count_nonzero, np.median]})
suppress_median(bezos_gender_race_group_age5)
```

[243]:

```
                                      count_nonzero    median
race_grouping   gender age_group_5
white           Female 45-49                   7.00 160780.00
```

```
                  Male   55-59                     8.00 156806.68
                  Female 40-44                     6.00 143750.00
                  Male   40-44                    15.00 136467.50
person of color Male   35-39                     8.00 115530.00
white             Female 50-54                     8.00 114975.40
                  Male   35-39                    24.00 107880.00
                  Female 35-39                    15.00 105000.00
                  Male   45-49                     9.00 102795.60
person of color Female 35-39                     8.00  99619.25
white             Male   30-34                    29.00  94780.00
person of color Male   25-29                     8.00  88540.00
white             Female 30-34                    24.00  87050.00
person of color Male   30-34                     5.00  87000.00
                  Female 30-34                    19.00  87000.00
white             Female 25-29                    37.00  81756.58
person of color Female 25-29                    19.00  77000.00
white             Male   25-29                    21.00  76780.00
person of color Female <25                      10.00  64390.00
white             Female <25                       9.00  64280.00
```

[244]:
```
graham_gender_race_group_age5 = graham.
 ↪groupby(['race_grouping','gender','age_group_5']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress_median(graham_gender_race_group_age5)
```

[244]:
```
                                            count_nonzero    median
race_grouping   gender age_group_5
white             Male   65+                       8.00 153937.49
                         35-39                    11.00 147300.00
                         55-59                    19.00 146541.57
                  Female 55-59                    16.00 138564.42
                  Male   50-54                    21.00 134546.92
                         60-64                    14.00 123514.68
                  Female 40-44                     5.00 120780.00
person of color Female 40-44                     5.00 118512.33
                  Male   50-54                    11.00 116349.15
white             Male   40-44                    17.00 115236.94
                  Female 50-54                    15.00 114803.00
                         60-64                     7.00 112511.94
                  Male   45-49                     8.00 111473.26
                  Female 45-49                    12.00 100909.67
                         30-34                     8.00 100787.50
person of color Female 50-54                     5.00  96944.47
white             Female 35-39                    11.00  88000.00
                  Male   30-34                     5.00  83649.71
```

[245]:
```

```

```
bezos_gender_race_group_age5_tier = bezos.
 ↪groupby(['race_grouping','gender','age_group_5','tier']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(bezos_gender_race_group_age5_tier)
```

[245]:

```
                                                 count_nonzero    median
race_grouping   gender age_group_5 tier
white           Male   40-44       Tier 1                 7.00 193280.00
                       35-39       Tier 1                10.00 130017.50
                Female 35-39       Tier 1                 8.00 128330.00
                Male   30-34       Tier 1                12.00 125233.27
                       45-49       Tier 2                 5.00 120780.00
                Female 25-29       Tier 1                 5.00 100000.00
                Male   30-34       Tier 2                 5.00 100000.00
                       35-39       Tier 2                 8.00  98890.00
                Female 30-34       Tier 2                 6.00  93780.00
                Male   25-29       Tier 2                 6.00  91282.50
                Female 25-29       Tier 2                 9.00  91000.00
                Male   35-39       Tier 3                 5.00  90280.00
person of color Female 30-34       Tier 2                 7.00  88132.61
white           Female 30-34       Tier 3                 9.00  86000.00
                Male   30-34       Tier 3                 7.00  86000.00
person of color Female 30-34       Tier 3                 6.00  83889.94
white           Male   25-29       Tier 3                 6.00  80250.00
person of color Female 25-29       Tier 3                11.00  77000.00
white           Female 25-29       Tier 3                11.00  74780.00
                                   Tier 4                 8.00  69890.00
```

[246]:

```
graham_gender_race_group_age5_tier = graham.
 ↪groupby(['race_grouping','gender','age_group_5','tier']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(graham_gender_race_group_age5_tier)
```

[246]:

```
                                                 count_nonzero    median
race_grouping   gender age_group_5 tier
white           Male   55-59       Tier 1                 5.00 175780.00
                       35-39       Tier 1                 5.00 173280.00
                Female 50-54       Tier 1                 5.00 167780.00
                       55-59       Tier 1                 6.00 162854.23
                Male   40-44       Tier 1                 6.00 151590.08
                Female 55-59       Tier 2                 5.00 149029.98
                Male   65+         Tier 2                 6.00 147473.21
                       35-39       Tier 2                 5.00 147300.00
                       55-59       Tier 2                12.00 143129.04
                       50-54       Tier 2                13.00 128052.85
person of color Male   50-54       Tier 2                 7.00 121515.90
white           Male   60-64       Tier 2                 6.00 115891.66
                Female 50-54       Tier 2                 7.00 108375.68
```

```
        30-34       Tier 2          5.00 107040.00
        45-49       Tier 2          6.00  98982.30
Male    40-44       Tier 2          8.00  97119.98
Female  35-39       Tier 2          6.00  87540.00
Male    45-49       Tier 2          5.00  87277.77
Female  55-59       Tier 3          5.00  81108.52
```

1.5.12 Overall disparity calculations

[247]:
```python
news_groups = news_salaried.groupby(['age_group_5','tier']).
    ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
expected_medians = pd.merge(news_salaried, news_groups, on=['age_group_5',␣
    ↪'tier'])
```

```
/Library/Frameworks/Python.framework/Versions/3.6/lib/python3.6/site-
packages/pandas/core/reshape/merge.py:522: UserWarning: merging between
different levels can give an unintended result (1 levels on the left, 2 on the
right)
  warnings.warn(msg, UserWarning)
```

[248]:
```python
below_expected_medians = expected_medians[expected_medians['current_base_pay']␣
    ↪< expected_medians[('current_base_pay', 'median')]].
    ↪groupby(['race_grouping','gender']).agg({'current_base_pay': [np.
    ↪count_nonzero]})
suppress(below_expected_medians)
```

[248]:
```
                        count_nonzero
race_grouping   gender
person of color Female          48.00
                Male            27.00
unknown         Female           8.00
                Male             8.00
white           Female          93.00
                Male            89.00
```

[249]:
```python
above_expected_medians = expected_medians[expected_medians['current_base_pay']␣
    ↪> expected_medians[('current_base_pay', 'median')]].
    ↪groupby(['race_grouping','gender']).agg({'current_base_pay': [np.
    ↪count_nonzero]})
suppress(above_expected_medians)
```

[249]:
```
                        count_nonzero
race_grouping   gender
person of color Female          30.00
                Male            21.00
unknown         Male             8.00
white           Female          90.00
                Male           121.00
```

[250]:
```
expected_medians['disparity'] = expected_medians['current_base_pay'] -
↪expected_medians[('current_base_pay', 'median')]
expected_medians['disparity_pct'] = (expected_medians['current_base_pay'] -
↪expected_medians[('current_base_pay', 'median')])/
↪expected_medians[('current_base_pay', 'median')]
```

[251]:
```
disparity = expected_medians.groupby(['race_grouping','gender']).
↪agg({'disparity': [np.count_nonzero, np.median]})
suppress(disparity)
```

[251]:
```
                              count_nonzero   median
race_grouping   gender
person of color Female                78.00 -1500.00
                Male                  48.00     0.00
unknown         Female                11.00 -3500.00
                Male                  16.00  2177.25
white           Female               183.00     0.00
                Male                 210.00  2457.75
```

[252]:
```
disparity_pct_above = expected_medians[expected_medians['disparity_pct'] > .05].
↪groupby(['race_grouping','gender']).agg({'disparity': [np.count_nonzero, np.
↪median]})
suppress(disparity_pct_above)
```

[252]:
```
                              count_nonzero   median
race_grouping   gender
person of color Female                21.00  9610.00
                Male                  16.00 25880.00
unknown         Male                   7.00 30000.00
white           Female                61.00 21485.87
                Male                 100.00 28677.74
```

[253]:
```
disparity_pct_below = expected_medians[expected_medians['disparity_pct'] < -.
↪05].groupby(['race_grouping','gender']).agg({'disparity': [np.count_nonzero,
↪np.median]})
suppress(disparity_pct_below)
```

[253]:
```
                              count_nonzero    median
race_grouping   gender
person of color Female                36.00 -10195.04
                Male                  19.00 -15435.00
unknown         Female                 5.00 -14220.00
                Male                   5.00 -15000.00
white           Female                72.00 -14000.00
                Male                  70.00 -18765.53
```

[254]:
```
expected_medians.groupby(['race_grouping','gender']).agg({'disparity_pct': [np.
↪count_nonzero, np.average]})
```

[254]:
```
                           disparity_pct
                           count_nonzero average
race_grouping    gender
person of color  Female            78.00   -0.01
                 Male              48.00    0.03
unknown          Female            11.00   -0.05
                 Male              16.00    0.04
white            Female           183.00    0.05
                 Male             210.00    0.10
```

[255]:
```
bezos_news_groups = bezos.groupby(['age_group_5','tier']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
bezos_expected_medians = pd.merge(bezos, bezos_news_groups, on=['age_group_5',␣
 ↪'tier'])
graham_news_groups = graham.groupby(['age_group_5','tier']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
graham_expected_medians = pd.merge(graham, graham_news_groups,␣
 ↪on=['age_group_5', 'tier'])
```

[256]:
```
bezos_expected_medians['disparity'] =␣
 ↪bezos_expected_medians['current_base_pay'] -␣
 ↪bezos_expected_medians[('current_base_pay', 'median')]
bezos_expected_medians['disparity_pct'] =␣
 ↪(bezos_expected_medians['current_base_pay'] -␣
 ↪bezos_expected_medians[('current_base_pay', 'median')])/
 ↪bezos_expected_medians[('current_base_pay', 'median')]
graham_expected_medians['disparity'] =␣
 ↪graham_expected_medians['current_base_pay'] -␣
 ↪graham_expected_medians[('current_base_pay', 'median')]
graham_expected_medians['disparity_pct'] =␣
 ↪(graham_expected_medians['current_base_pay'] -␣
 ↪graham_expected_medians[('current_base_pay', 'median')])/
 ↪graham_expected_medians[('current_base_pay', 'median')]
```

[257]:
```
bezos_disparity_gender = bezos_expected_medians.groupby(['gender']).
 ↪agg({'disparity_pct': [np.count_nonzero, np.average]})
suppress(bezos_disparity_gender)
```

[257]:
```
        count_nonzero  average
gender
Female         169.00     0.04
Male           142.00     0.07
```

[258]:
```
bezos_disparity_race_group = bezos_expected_medians.groupby(['race_grouping']).
 ↪agg({'disparity_pct': [np.count_nonzero, np.average]})
suppress(bezos_disparity_race_group)
```

[258]:
```
                 count_nonzero  average
race_grouping
```

```
person of color           83.00     0.02
unknown                   19.00    -0.01
white                    209.00     0.07
```

[259]:
```
bezos_disparity_gender_race_group = bezos_expected_medians.
 ↪groupby(['race_grouping','gender']).agg({'disparity_pct': [np.count_nonzero,␣
 ↪np.average]})
suppress(bezos_disparity_gender_race_group)
```

[259]:
```
                               count_nonzero  average
race_grouping   gender
person of color Female                 56.00     0.01
                Male                   27.00     0.05
unknown         Female                  9.00    -0.06
                Male                   10.00     0.04
white           Female                104.00     0.06
                Male                  105.00     0.08
```

[260]:
```
graham_disparity_gender = graham_expected_medians.groupby(['gender']).
 ↪agg({'disparity_pct': [np.count_nonzero, np.average]})
suppress(graham_disparity_gender)
```

[260]:
```
        count_nonzero  average
gender
Female          99.00     0.02
Male           125.00     0.07
```

[261]:
```
graham_disparity_race_group = graham_expected_medians.
 ↪groupby(['race_grouping']).agg({'disparity_pct': [np.count_nonzero, np.
 ↪average]})
suppress(graham_disparity_race_group)
```

[261]:
```
                 count_nonzero  average
race_grouping
person of color          43.00    -0.05
unknown                   8.00    -0.05
white                   173.00     0.07
```

[262]:
```
graham_disparity_gender_race_group = graham_expected_medians.
 ↪groupby(['race_grouping','gender']).agg({'disparity_pct': [np.count_nonzero,␣
 ↪np.average]})
suppress(graham_disparity_gender_race_group)
```

[262]:
```
                               count_nonzero  average
race_grouping   gender
person of color Female                 21.00    -0.06
                Male                   22.00    -0.04
unknown         Male                    5.00    -0.03
white           Female                 75.00     0.04
                Male                   98.00     0.10
```

1.5.13 Regression

[263]:
```
news_salaried_regression =␣
  ↪news_salaried[['department','gender','race_ethnicity','current_base_pay','job_profile_curre
news_salaried_regression = pd.get_dummies(news_salaried_regression,␣
  ↪columns=['gender','race_ethnicity','age_group_5','years_of_service_grouped','dept','desk','
```

[264]:
```
news_salaried_regression = news_salaried_regression.
  ↪rename(columns={'race_grouping_person of color':
  ↪'race_grouping_person_of_color','age_group_5_<25':
  ↪'age_group_5_25_under','age_group_5_25-29':
  ↪'age_group_5_25to29','age_group_5_30-34':
  ↪'age_group_5_30to34','age_group_5_35-39':
  ↪'age_group_5_35to39','age_group_5_40-44':
  ↪'age_group_5_40to44','age_group_5_45-49':
  ↪'age_group_5_45to49','age_group_5_50-54':
  ↪'age_group_5_50to54','age_group_5_55-59':
  ↪'age_group_5_55to59','age_group_5_60-64':
  ↪'age_group_5_60to64','age_group_5_65+':'age_group_5_65_over','tier_Tier 1':
  ↪'tier_Tier_1','tier_Tier 2':'tier_Tier_2','tier_Tier 3':
  ↪'tier_Tier_3','tier_Tier 4':'tier_Tier_4','years_of_service_grouped_0':
  ↪'years_of_service_grouped_0','years_of_service_grouped_1-2':
  ↪'years_of_service_grouped_1to2','years_of_service_grouped_3-5':
  ↪'years_of_service_grouped_3to5','years_of_service_grouped_6-10':
  ↪'years_of_service_grouped_6to10','years_of_service_grouped_11-15':
  ↪'years_of_service_grouped_11to15','years_of_service_grouped_16-20':
  ↪'years_of_service_grouped_16to20','years_of_service_grouped_21-25':
  ↪'years_of_service_grouped_21to25','years_of_service_grouped_25+':
  ↪'years_of_service_grouped_25_over'})
import statsmodels.formula.api as sm
model1 = sm.ols(data=news_salaried_regression, formula = 'current_base_pay ~␣
  ↪gender_Female + gender_Male')
result1 = model1.fit()
result1.summary()
```

[264]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.040
Model:                            OLS   Adj. R-squared:                  0.036
Method:                 Least Squares   F-statistic:                     11.76
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           9.87e-06
Time:                        10:27:46   Log-Likelihood:                -6931.6
No. Observations:                 574   AIC:                         1.387e+04
Df Residuals:                     571   BIC:                         1.388e+04
Df Model:                           2
Covariance Type:            nonrobust
```

```
================================================================================
=
                    coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept      7.739e+04   1185.564     65.281      0.000    7.51e+04
7.97e+04
gender_Female  3.007e+04   1880.411     15.992      0.000    2.64e+04
3.38e+04
gender_Male    4.732e+04   1868.654     25.324      0.000    4.37e+04
5.1e+04
==============================================================================
Omnibus:                      138.887   Durbin-Watson:                   1.681
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              287.507
Skew:                           1.320   Prob(JB):                     3.70e-63
Kurtosis:                       5.246   Cond. No.                     1.48e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 3.93e-28. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[265]:

```python
model2 = sm.ols(data=news_salaried_regression, formula = 'current_base_pay ~
 ↪race_grouping_white + race_grouping_person_of_color')
result2 = model2.fit()
result2.summary()
```

[265]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.043
Model:                            OLS   Adj. R-squared:                  0.040
Method:                 Least Squares   F-statistic:                     12.81
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           3.60e-06
Time:                        10:27:46   Log-Likelihood:                -6930.6
No. Observations:                 574   AIC:                         1.387e+04
Df Residuals:                     571   BIC:                         1.388e+04
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
```

```
--------------------------------------------------------------------------------
-----------------
Intercept                     1.271e+05   7897.372     16.092      0.000
1.12e+05    1.43e+05
race_grouping_white          -6301.9244   8174.557     -0.771      0.441
-2.24e+04    9753.945
race_grouping_person_of_color -2.661e+04   8682.201     -3.065      0.002
-4.37e+04   -9560.605
==============================================================================
Omnibus:                      128.063   Durbin-Watson:                   1.632
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              248.772
Skew:                           1.253   Prob(JB):                     9.55e-55
Kurtosis:                       5.030   Cond. No.                         9.91
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[266]:

```
model3 = sm.ols(data=news_salaried_regression, formula = 'current_base_pay ~␣
↪gender_Female + gender_Male + race_grouping_white +␣
↪race_grouping_person_of_color')
result3 = model3.fit()
result3.summary()
```

[266]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        current_base_pay   R-squared:                       0.074
Model:                             OLS   Adj. R-squared:                  0.069
Method:                  Least Squares   F-statistic:                     15.18
Date:                 Wed, 06 Nov 2019   Prob (F-statistic):           1.62e-09
Time:                         10:27:46   Log-Likelihood:                -6921.2
No. Observations:                  574   AIC:                         1.385e+04
Df Residuals:                      570   BIC:                         1.387e+04
Df Model:                            3
Covariance Type:             nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      8.419e+04   5184.782     16.238      0.000
7.4e+04    9.44e+04
gender_Female                   3.44e+04   3167.032     10.863      0.000
```

```
2.82e+04    4.06e+04
gender_Male                     4.979e+04   3098.878     16.066      0.000
4.37e+04    5.59e+04
race_grouping_white            -6074.5808   8048.101     -0.755      0.451
-2.19e+04    9732.973
race_grouping_person_of_color -2.432e+04   8563.749     -2.840      0.005
-4.11e+04   -7503.406
==============================================================================
Omnibus:                      132.663   Durbin-Watson:                   1.660
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              270.377
Skew:                           1.269   Prob(JB):                     1.94e-59
Kurtosis:                       5.205   Cond. No.                     1.68e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.23e-28. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[267]:
```python
new_news_salaried_regression = pd.DataFrame({'gender_Female': [1,0,1,0],␣
 ↪'gender_Male': [0,1,0,1], 'race_grouping_white': [1,1,0,0],␣
 ↪'race_grouping_person_of_color': [0,0,1,1], 'age': [40,40,40,40]})
new_news_salaried_regression['predicted'] = result3.
 ↪predict(new_news_salaried_regression)
new_news_salaried_regression
```

[267]:
```
   gender_Female  gender_Male  race_grouping_white  \
0              1            0                    1
1              0            1                    1
2              1            0                    0
3              0            1                    0

   race_grouping_person_of_color  age  predicted
0                              0   40  112522.15
1                              0   40  127905.73
2                              1   40   94272.97
3                              1   40  109656.55
```

[268]:
```python
model4 = sm.ols(data=news_salaried_regression, formula = 'current_base_pay ~␣
 ↪gender_Female + gender_Male + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result4 = model4.fit()
result4.summary()
```

[268]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.268
Model:                            OLS   Adj. R-squared:                  0.255
Method:                 Least Squares   F-statistic:                     20.63
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           9.77e-33
Time:                        10:27:46   Log-Likelihood:                -6853.6
No. Observations:                 574   AIC:                         1.373e+04
Df Residuals:                     563   BIC:                         1.378e+04
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept             7.547e+04   1169.257     64.546      0.000    7.32e+04
7.78e+04
gender_Female         3.365e+04   1722.563     19.536      0.000    3.03e+04
3.7e+04
gender_Male           4.182e+04   1697.671     24.632      0.000    3.85e+04
4.52e+04
age_group_5_25_under -4.454e+04   7177.390     -6.205      0.000   -5.86e+04
-3.04e+04
age_group_5_25to29    -2.51e+04   3987.825     -6.294      0.000   -3.29e+04
-1.73e+04
age_group_5_30to34   -8982.7087   3766.135     -2.385      0.017   -1.64e+04
-1585.316
age_group_5_35to39    1532.0128   4043.258      0.379      0.705   -6409.700
9473.725
age_group_5_40to44    1.998e+04   4621.927      4.322      0.000    1.09e+04
2.91e+04
age_group_5_45to49    1.214e+04   5439.050      2.231      0.026    1453.537
2.28e+04
age_group_5_50to54    1.483e+04   4405.774      3.367      0.001    6179.782
2.35e+04
age_group_5_55to59    3.081e+04   5045.129      6.108      0.000    2.09e+04
4.07e+04
age_group_5_60to64    2.446e+04   6619.091      3.695      0.000    1.15e+04
3.75e+04
age_group_5_65_over   5.034e+04   8904.898      5.653      0.000    3.28e+04
6.78e+04
==============================================================================
Omnibus:                      164.069   Durbin-Watson:                   1.859
```

```
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              434.791
Skew:                           1.424   Prob(JB):                     3.86e-95
Kurtosis:                       6.173   Cond. No.                     3.50e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 7.64e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[269]:
```
model5 = sm.ols(data=news_salaried_regression, formula = 'current_base_pay ~␣
 ↪race_grouping_white + race_grouping_person_of_color + age_group_5_25_under +␣
 ↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
 ↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
 ↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result5 = model5.fit()
result5.summary()
```

[269]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.278
Model:                            OLS   Adj. R-squared:                  0.264
Method:                 Least Squares   F-statistic:                     19.71
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           1.04e-33
Time:                        10:27:47   Log-Likelihood:                -6849.6
No. Observations:                 574   AIC:                         1.372e+04
Df Residuals:                     562   BIC:                         1.378e+04
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      1.214e+05   6405.473     18.954      0.000
1.09e+05    1.34e+05
race_grouping_white           -1.047e+04   7206.280     -1.453      0.147
-2.46e+04    3682.522
race_grouping_person_of_color -2.275e+04   7648.553     -2.974      0.003
-3.78e+04   -7724.844
age_group_5_25_under          -3.946e+04   7161.284     -5.510      0.000
-5.35e+04   -2.54e+04
age_group_5_25to29            -2.106e+04   3963.986     -5.313      0.000
```

```
-2.88e+04   -1.33e+04
age_group_5_30to34          -4725.1241   3744.627     -1.262      0.208
-1.21e+04    2630.051
age_group_5_35to39           7317.7479   4085.001      1.791      0.074
-705.987     1.53e+04
age_group_5_40to44           2.557e+04   4583.847      5.579      0.000
1.66e+04     3.46e+04
age_group_5_45to49           1.616e+04   5474.110      2.953      0.003
5410.289     2.69e+04
age_group_5_50to54           2.101e+04   4434.740      4.738      0.000
1.23e+04     2.97e+04
age_group_5_55to59           3.468e+04   5070.678      6.839      0.000
2.47e+04     4.46e+04
age_group_5_60to64           2.782e+04   6646.739      4.185      0.000
1.48e+04     4.09e+04
age_group_5_65_over          5.409e+04   8887.598      6.086      0.000
3.66e+04     7.15e+04
==============================================================================
Omnibus:                      164.311   Durbin-Watson:                   1.827
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              428.700
Skew:                           1.434   Prob(JB):                     8.11e-94
Kurtosis:                       6.114   Cond. No.                     4.33e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 5.26e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[270]:
```
model6 = sm.ols(data=news_salaried_regression, formula = 'current_base_pay ~
 ↪gender_Female + gender_Male + race_grouping_white +
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +
 ↪age_group_5_60to64 + age_group_5_65_over')
result6 = model6.fit()
result6.summary()
```

[270]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.285
Model:                            OLS   Adj. R-squared:                  0.269
Method:                 Least Squares   F-statistic:                     18.61
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           4.46e-34
```

```
Time:                        10:27:47   Log-Likelihood:                -6847.0
No. Observations:                 574   AIC:                         1.372e+04
Df Residuals:                     561   BIC:                         1.378e+04
Df Model:                          12
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      8.317e+04   4390.292     18.944      0.000
7.45e+04    9.18e+04
gender_Female                  3.802e+04   2754.420     13.803      0.000
3.26e+04    4.34e+04
gender_Male                    4.515e+04   2676.058     16.872      0.000
3.99e+04    5.04e+04
race_grouping_white           -1.024e+04   7181.661     -1.426      0.154
-2.44e+04    3862.150
race_grouping_person_of_color -2.178e+04   7634.018     -2.853      0.004
-3.68e+04   -6784.597
age_group_5_25_under          -4.129e+04   7165.506     -5.762      0.000
-5.54e+04   -2.72e+04
age_group_5_25to29            -2.371e+04   3972.663     -5.968      0.000
-3.15e+04   -1.59e+04
age_group_5_30to34            -8102.4208   3737.928     -2.168      0.031
-1.54e+04    -760.377
age_group_5_35to39             3133.7668   4052.539      0.773      0.440
-4826.237    1.11e+04
age_group_5_40to44             2.076e+04   4584.120      4.529      0.000
1.18e+04    2.98e+04
age_group_5_45to49             1.224e+04   5430.218      2.254      0.025
1573.060    2.29e+04
age_group_5_50to54             1.662e+04   4406.543      3.772      0.000
7964.806    2.53e+04
age_group_5_55to59             3.053e+04   5035.484      6.064      0.000
2.06e+04    4.04e+04
age_group_5_60to64             2.369e+04   6599.643      3.589      0.000
1.07e+04    3.66e+04
age_group_5_65_over            4.929e+04   8839.927      5.576      0.000
3.19e+04    6.67e+04
==============================================================================
Omnibus:                      164.304   Durbin-Watson:                   1.830
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              437.349
Skew:                           1.424   Prob(JB):                     1.07e-95
Kurtosis:                       6.190   Cond. No.                     5.46e+15
==============================================================================
```

```
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.26e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[271]:
```python
model7 = sm.ols(data=news_salaried_regression, formula = 'current_base_pay ~␣
 ↪gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over + tier_Tier_1 + tier_Tier_2 +␣
 ↪tier_Tier_3 + tier_Tier_4')
result7 = model7.fit()
result7.summary()
```

[271]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.468
Model:                            OLS   Adj. R-squared:                  0.453
Method:                 Least Squares   F-statistic:                     30.65
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           5.96e-66
Time:                        10:27:47   Log-Likelihood:                -6762.0
No. Observations:                 574   AIC:                         1.356e+04
Df Residuals:                     557   BIC:                         1.363e+04
Df Model:                          16
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                       6.71e+04   5610.010     11.961      0.000
5.61e+04    7.81e+04
gender_Female                  3.114e+04   3178.867      9.796      0.000
2.49e+04    3.74e+04
gender_Male                    3.596e+04   3080.637     11.672      0.000
2.99e+04     4.2e+04
race_grouping_white            1.021e+04   6456.704      1.581      0.114
-2474.772     2.29e+04
race_grouping_person_of_color  1590.1942   6868.290      0.232      0.817
-1.19e+04     1.51e+04
age_group_5_25_under          -3.328e+04   6252.504     -5.323      0.000
```

```
-4.56e+04    -2.1e+04
age_group_5_25to29            -1.518e+04   3560.433     -4.264      0.000
-2.22e+04    -8187.622
age_group_5_30to34            -7122.3046   3257.952     -2.186      0.029
-1.35e+04    -722.931
age_group_5_35to39            -2713.7685   3565.793     -0.761      0.447
-9717.813    4290.276
age_group_5_40to44              1.51e+04   4003.127      3.772      0.000
7234.726     2.3e+04
age_group_5_45to49             1.045e+04   4759.738      2.195      0.029
1099.480    1.98e+04
age_group_5_50to54             1.739e+04   3856.830      4.510      0.000
9818.978     2.5e+04
age_group_5_55to59             2.519e+04   4413.333      5.709      0.000
1.65e+04    3.39e+04
age_group_5_60to64             1.896e+04   5743.118      3.302      0.001
7683.999    3.02e+04
age_group_5_65_over             3.83e+04   7727.397      4.956      0.000
2.31e+04    5.35e+04
tier_Tier_1                    3.272e+04   6633.224      4.933      0.000
1.97e+04    4.58e+04
tier_Tier_2                    1744.2999   6479.903      0.269      0.788
-1.1e+04    1.45e+04
tier_Tier_3                   -1.888e+04   6638.849     -2.844      0.005
-3.19e+04   -5839.310
tier_Tier_4                   -2.075e+04   8097.266     -2.562      0.011
-3.67e+04   -4843.693
==============================================================================
Omnibus:                      215.055   Durbin-Watson:                   1.864
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              959.817
Skew:                           1.648   Prob(JB):                    3.79e-209
Kurtosis:                       8.410   Cond. No.                     5.90e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.11e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[272]:

```
model8 = sm.ols(data=news_salaried_regression, formula = 'current_base_pay ~␣
 ↪gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over + tier_Tier_1 + tier_Tier_2 +␣
 ↪tier_Tier_3 + tier_Tier_4 + years_of_service_grouped_0 +␣
 ↪years_of_service_grouped_1to2 + years_of_service_grouped_3to5 +␣
 ↪years_of_service_grouped_6to10 + years_of_service_grouped_11to15 +␣
 ↪years_of_service_grouped_16to20 + years_of_service_grouped_21to25 +␣
 ↪years_of_service_grouped_25_over')
result8 = model8.fit()
result8.summary()
```

[272]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.475
Model:                            OLS   Adj. R-squared:                  0.453
Method:                 Least Squares   F-statistic:                     21.63
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           2.04e-62
Time:                        10:27:47   Log-Likelihood:                -6758.3
No. Observations:                 574   AIC:                         1.356e+04
Df Residuals:                     550   BIC:                         1.367e+04
Df Model:                          23
Covariance Type:            nonrobust
================================================================================
====================
                                       coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
--------------------
Intercept                         6.117e+04   5242.405     11.668      0.000
5.09e+04    7.15e+04
gender_Female                     2.823e+04   3011.909      9.373      0.000
2.23e+04    3.41e+04
gender_Male                       3.294e+04   2923.835     11.265      0.000
2.72e+04    3.87e+04
race_grouping_white               1.068e+04   6477.491      1.648      0.100
-2046.534    2.34e+04
race_grouping_person_of_color     2147.6298   6898.961      0.311      0.756
-1.14e+04    1.57e+04
age_group_5_25_under             -3.821e+04   6642.301     -5.752      0.000
-5.13e+04   -2.52e+04
age_group_5_25to29               -1.808e+04   3999.056     -4.521      0.000
-2.59e+04   -1.02e+04
```

```
age_group_5_30to34              -8875.1051   3619.177     -2.452      0.015
-1.6e+04   -1766.005
age_group_5_35to39              -4003.6497   3846.671     -1.041      0.298
-1.16e+04    3552.315
age_group_5_40to44               1.462e+04   4113.878      3.554      0.000
6538.759    2.27e+04
age_group_5_45to49               1.107e+04   4841.180      2.287      0.023
1562.753    2.06e+04
age_group_5_50to54               1.852e+04   3991.699      4.639      0.000
1.07e+04    2.64e+04
age_group_5_55to59               2.653e+04   4650.059      5.706      0.000
1.74e+04    3.57e+04
age_group_5_60to64               1.895e+04   6575.681      2.882      0.004
6032.091    3.19e+04
age_group_5_65_over              4.064e+04   7966.529      5.101      0.000
2.5e+04    5.63e+04
tier_Tier_1                      3.309e+04   6652.958      4.974      0.000
2e+04    4.62e+04
tier_Tier_2                      2399.3566   6509.221      0.369      0.713
-1.04e+04    1.52e+04
tier_Tier_3                     -1.918e+04   6645.430     -2.886      0.004
-3.22e+04   -6122.653
tier_Tier_4                     -2.167e+04   8152.480     -2.658      0.008
-3.77e+04   -5657.739
years_of_service_grouped_0       1.332e+04   4281.224      3.112      0.002
4915.085    2.17e+04
years_of_service_grouped_1to2    1.387e+04   3327.196      4.167      0.000
7330.399    2.04e+04
years_of_service_grouped_3to5    8772.2226   3262.142      2.689      0.007
2364.441    1.52e+04
years_of_service_grouped_6to10   5135.7202   4106.907      1.251      0.212
-2931.422    1.32e+04
years_of_service_grouped_11to15  5367.3146   4446.798      1.207      0.228
-3367.471    1.41e+04
years_of_service_grouped_16to20  5973.2655   4078.267      1.465      0.144
-2037.619     1.4e+04
years_of_service_grouped_21to25 -1787.3518   6278.264     -0.285      0.776
-1.41e+04    1.05e+04
years_of_service_grouped_25_over 1.052e+04   6148.567      1.710      0.088
-1562.273    2.26e+04
==============================================================================
Omnibus:                      205.644   Durbin-Watson:                   1.878
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              854.496
Skew:                           1.594   Prob(JB):                   2.81e-186
Kurtosis:                       8.056   Cond. No.                     1.12e+16
==============================================================================
```

```
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.21e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[273]:
```python
merit_raises_combined_salaried_regression = 
 ↪merit_raises_combined[(merit_raises_combined['dept'] == 'News') & 
 ↪(merit_raises_combined['pay_rate_type'] == 'Salaried')]
merit_raises_combined_salaried_regression = pd.
 ↪get_dummies(merit_raises_combined_salaried_regression, 
 ↪columns=['gender','race_grouping','age_group_5'])
```

[274]:
```python
merit_raises_combined_salaried_regression = 
 ↪merit_raises_combined_salaried_regression.
 ↪rename(columns={'race_grouping_person of color':
 ↪'race_grouping_person_of_color','age_group_5_<25':
 ↪'age_group_5_25_under','age_group_5_25-29':
 ↪'age_group_5_25to29','age_group_5_30-34':
 ↪'age_group_5_30to34','age_group_5_35-39':
 ↪'age_group_5_35to39','age_group_5_40-44':
 ↪'age_group_5_40to44','age_group_5_45-49':
 ↪'age_group_5_45to49','age_group_5_50-54':
 ↪'age_group_5_50to54','age_group_5_55-59':
 ↪'age_group_5_55to59','age_group_5_60-64':
 ↪'age_group_5_60to64','age_group_5_65+':'age_group_5_65_over'})
model9 = sm.ols(data=merit_raises_combined_salaried_regression, formula = 
 ↪'base_pay_change ~ gender_Female + gender_Male')
result9 = model9.fit()
result9.summary()
```

[274]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.004
Model:                            OLS   Adj. R-squared:                  0.003
Method:                 Least Squares   F-statistic:                     3.275
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0707
Time:                        10:27:48   Log-Likelihood:                -7121.9
No. Observations:                 811   AIC:                         1.425e+04
Df Residuals:                     809   BIC:                         1.426e+04
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                    coef    std err          t      P>|t|      [0.025
```

```
0.975]
------------------------------------------------------------------------------
-
Intercept      2116.8178     37.068     57.107      0.000    2044.057
2189.578
gender_Female   957.7901     60.044     15.951      0.000     839.929
1075.651
gender_Male    1159.0276     57.138     20.285      0.000    1046.871
1271.185
==============================================================================
Omnibus:                      599.428   Durbin-Watson:                   1.975
Prob(Omnibus):                  0.000   Jarque-Bera (JB):            15042.743
Skew:                           3.055   Prob(JB):                         0.00
Kurtosis:                      23.195   Cond. No.                     5.43e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.14e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[275]:
```
model10 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
↪'base_pay_change ~ race_grouping_white + race_grouping_person_of_color')
result10 = model10.fit()
result10.summary()
```

[275]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.007
Model:                            OLS   Adj. R-squared:                  0.005
Method:                 Least Squares   F-statistic:                     2.905
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0553
Time:                        10:27:48   Log-Likelihood:                -7120.6
No. Observations:                 811   AIC:                         1.425e+04
Df Residuals:                     808   BIC:                         1.426e+04
Df Model:                           2
Covariance Type:            nonrobust
==============================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
------------------------------------------------------------------------------
-----------------
Intercept                      3426.7500    394.132      8.694      0.000
```

```
2653.106    4200.394
race_grouping_white              -179.1878    399.177     -0.449      0.654
-962.735     604.359
race_grouping_person_of_color    -494.0711    411.855     -1.200      0.231
-1302.503     314.361
==============================================================================
Omnibus:                      595.371   Durbin-Watson:                   1.967
Prob(Omnibus):                  0.000   Jarque-Bera (JB):            14962.329
Skew:                           3.023   Prob(JB):                         0.00
Kurtosis:                      23.155   Cond. No.                         16.1
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[276]:
```
model11 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'base_pay_change ~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color')
result11 = model11.fit()
result11.summary()
```

[276]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.010
Model:                            OLS   Adj. R-squared:                  0.007
Method:                 Least Squares   F-statistic:                     2.802
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0390
Time:                        10:27:48   Log-Likelihood:                -7119.3
No. Observations:                 811   AIC:                         1.425e+04
Df Residuals:                     807   BIC:                         1.427e+04
Df Model:                           3
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      2291.9731    262.539      8.730      0.000
1776.633    2807.313
gender_Female                  1056.3093    141.724      7.453      0.000
778.117    1334.501
gender_Male                    1235.6638    143.543      8.608      0.000
953.901    1517.426
```

```
race_grouping_white            -202.9609    399.061     -0.509      0.611
-986.281     580.359
race_grouping_person_of_color  -496.0038    411.454     -1.205      0.228
-1303.650     311.642
==============================================================================
Omnibus:                      595.574   Durbin-Watson:                   1.970
Prob(Omnibus):                  0.000   Jarque-Bera (JB):            14866.159
Skew:                           3.027   Prob(JB):                         0.00
Kurtosis:                      23.082   Cond. No.                     6.20e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.58e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[277]:
```
new_reason_for_change_combined_regression = pd.DataFrame({'gender_Female':
 ↪[1,0,1,0], 'gender_Male': [0,1,0,1], 'race_grouping_white': [1,1,0,0],
 ↪'race_grouping_person_of_color': [0,0,1,1]})
new_reason_for_change_combined_regression['predicted'] = result11.
 ↪predict(new_reason_for_change_combined_regression)
new_reason_for_change_combined_regression
```

[277]:
```
   gender_Female  gender_Male  race_grouping_white  \
0              1            0                    1
1              0            1                    1
2              1            0                    0
3              0            1                    0

   race_grouping_person_of_color  predicted
0                              0    3145.32
1                              0    3324.68
2                              1    2852.28
3                              1    3031.63
```

[278]:
```
model12 = sm.ols(data=merit_raises_combined_salaried_regression, formula =
 ↪'base_pay_change ~ gender_Female + gender_Male + age_group_5_25_under +
 ↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
 ↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
 ↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result12 = model12.fit()
result12.summary()
```

[278]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
```

```
Dep. Variable:        base_pay_change   R-squared:                       0.047
Model:                            OLS   Adj. R-squared:                  0.035
Method:                 Least Squares   F-statistic:                     3.937
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           2.95e-05
Time:                        10:27:48   Log-Likelihood:                -7104.1
No. Observations:                 811   AIC:                         1.423e+04
Df Residuals:                     800   BIC:                         1.428e+04
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept             1900.1395     51.767     36.706      0.000    1798.525
2001.754
gender_Female          837.3584     61.567     13.601      0.000     716.506
958.211
gender_Male           1062.7812     60.759     17.492      0.000     943.516
1182.046
age_group_5_25_under  -625.0684    577.767     -1.082      0.280   -1759.186
509.049
age_group_5_25to29     348.4845    185.964      1.874      0.061     -16.551
713.520
age_group_5_30to34     508.1254    142.282      3.571      0.000     228.834
787.416
age_group_5_35to39     681.6571    149.030      4.574      0.000     389.122
974.193
age_group_5_40to44     629.9350    163.125      3.862      0.000     309.732
950.138
age_group_5_45to49     455.9623    179.299      2.543      0.011     104.010
807.914
age_group_5_50to54    -199.2284    148.416     -1.342      0.180    -490.559
92.102
age_group_5_55to59     249.0856    165.464      1.505      0.133     -75.710
573.881
age_group_5_60to64     163.6817    207.378      0.789      0.430    -243.387
570.750
age_group_5_65_over   -312.4953    240.444     -1.300      0.194    -784.471
159.480
==============================================================================
Omnibus:                      607.312   Durbin-Watson:                   1.979
Prob(Omnibus):                  0.000   Jarque-Bera (JB):            16080.305
Skew:                           3.095   Prob(JB):                         0.00
Kurtosis:                      23.918   Cond. No.                     5.24e+15
==============================================================================
```

```
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.81e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[279]:
```
model13 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'base_pay_change ~ race_grouping_white + race_grouping_person_of_color +␣
 ↪age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +␣
 ↪age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +␣
 ↪age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +␣
 ↪age_group_5_65_over')
result13 = model13.fit()
result13.summary()
```

[279]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.052
Model:                            OLS   Adj. R-squared:                  0.039
Method:                 Least Squares   F-statistic:                     3.976
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           1.17e-05
Time:                        10:27:48   Log-Likelihood:                -7101.9
No. Observations:                 811   AIC:                         1.423e+04
Df Residuals:                     799   BIC:                         1.428e+04
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      2856.8954    360.070      7.934      0.000
2150.101    3563.689
race_grouping_white             -33.7963    395.935     -0.085      0.932
-810.992     743.399
race_grouping_person_of_color  -425.7390    407.658     -1.044      0.297
-1225.947     374.469
age_group_5_25_under           -673.0990    579.089     -1.162      0.245
-1809.814     463.616
age_group_5_25to29              440.9979    187.438      2.353      0.019
73.070     808.926
age_group_5_30to34              628.8243    146.144      4.303      0.000
341.953     915.695
```

```
age_group_5_35to39               816.7998    153.462      5.323      0.000
515.564    1118.035
age_group_5_40to44               803.8584    163.611      4.913      0.000
482.700    1125.017
age_group_5_45to49               540.1748    182.411      2.961      0.003
182.113     898.237
age_group_5_50to54               -33.4153    153.074     -0.218      0.827
-333.891     267.060
age_group_5_55to59               333.7727    169.018      1.975      0.049
2.002      665.544
age_group_5_60to64               248.7739    208.615      1.193      0.233
-160.724     658.272
age_group_5_65_over             -249.7919    244.401     -1.022      0.307
-729.535     229.951
==============================================================================
Omnibus:                      601.567   Durbin-Watson:                   1.971
Prob(Omnibus):                  0.000   Jarque-Bera (JB):            15921.391
Skew:                           3.050   Prob(JB):                         0.00
Kurtosis:                      23.832   Cond. No.                     3.09e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.53e-28. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[280]:
```
model14 = sm.ols(data=merit_raises_combined_salaried_regression, formula =
 ↪'base_pay_change ~ gender_Female + gender_Male + race_grouping_white +
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +
 ↪age_group_5_60to64 + age_group_5_65_over')
result14 = model14.fit()
result14.summary()
```

[280]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.056
Model:                            OLS   Adj. R-squared:                  0.041
Method:                 Least Squares   F-statistic:                     3.916
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           7.08e-06
Time:                        10:27:48   Log-Likelihood:                -7100.3
No. Observations:                 811   AIC:                         1.423e+04
Df Residuals:                     798   BIC:                         1.429e+04
```

```
Df Model:                          12
Covariance Type:            nonrobust
================================================================================
=================
                                   coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                     1978.5484    247.351      7.999      0.000
1493.012    2464.085
gender_Female                  890.8640    133.899      6.653      0.000
628.028    1153.700
gender_Male                   1087.6844    137.238      7.926      0.000
818.295    1357.074
race_grouping_white            -64.1327    395.777     -0.162      0.871
-841.019     712.754
race_grouping_person_of_color -431.5462    407.127     -1.060      0.289
-1230.713     367.621
age_group_5_25_under          -688.0832    577.471     -1.192      0.234
-1821.625     445.459
age_group_5_25to29             375.2333    186.600      2.011      0.045
8.948     741.519
age_group_5_30to34             548.5259    144.590      3.794      0.000
264.704     832.348
age_group_5_35to39             725.4046    151.661      4.783      0.000
427.703    1023.106
age_group_5_40to44             687.3088    163.983      4.191      0.000
365.421    1009.197
age_group_5_45to49             447.0509    180.736      2.473      0.014
92.276     801.826
age_group_5_50to54            -140.0335    151.593     -0.924      0.356
-437.602     157.535
age_group_5_55to59             233.3376    167.382      1.394      0.164
-95.223     561.898
age_group_5_60to64             151.2637    207.454      0.729      0.466
-255.957     558.484
age_group_5_65_over           -361.4597    242.706     -1.489      0.137
-837.878     114.958
==============================================================================
Omnibus:                      602.033   Durbin-Watson:                   1.973
Prob(Omnibus):                  0.000   Jarque-Bera (JB):            15800.004
Skew:                           3.057   Prob(JB):                         0.00
Kurtosis:                      23.741   Cond. No.                     6.22e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
```

```
specified.
[2] The smallest eigenvalue is 4.8e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[281]:
```python
model15 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'performance_rating ~ gender_Female + gender_Male')
result15 = model15.fit()
result15.summary()
```

[281]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.012
Model:                            OLS   Adj. R-squared:                  0.011
Method:                 Least Squares   F-statistic:                     9.232
Date:                Wed, 06 Nov 2019   Prob (F-statistic):            0.00246
Time:                        10:27:49   Log-Likelihood:                -231.28
No. Observations:                 763   AIC:                             466.6
Df Residuals:                     761   BIC:                             475.8
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                    coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept         2.3801      0.008    299.623      0.000       2.364
2.396
gender_Female     1.1538      0.013     89.739      0.000       1.129
1.179
gender_Male       1.2262      0.012    100.061      0.000       1.202
1.250
==============================================================================
Omnibus:                       26.124   Durbin-Watson:                   1.853
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               28.140
Skew:                           0.470   Prob(JB):                     7.75e-07
Kurtosis:                       3.040   Cond. No.                     5.04e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.52e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[282]:
```
model16 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
↪'performance_rating ~ race_grouping_white + race_grouping_person_of_color')
result16 = model16.fit()
result16.summary()
```

[282]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.034
Model:                            OLS   Adj. R-squared:                  0.031
Method:                 Least Squares   F-statistic:                     13.37
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           1.97e-06
Time:                        10:27:49   Log-Likelihood:                -222.69
No. Observations:                 763   AIC:                             451.4
Df Residuals:                     760   BIC:                             465.3
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         3.7250      0.081     45.900      0.000
3.566       3.884
race_grouping_white              -0.1248      0.082     -1.517      0.130
-0.286       0.037
race_grouping_person_of_color    -0.2626      0.085     -3.089      0.002
-0.429      -0.096
==============================================================================
Omnibus:                       17.904   Durbin-Watson:                   1.871
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               18.639
Skew:                           0.381   Prob(JB):                     8.96e-05
Kurtosis:                       3.066   Cond. No.                         15.6
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[283]:
```
model17 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
↪'performance_rating ~ gender_Female + gender_Male + race_grouping_white +␣
↪race_grouping_person_of_color')
result17 = model17.fit()
result17.summary()
```

[283]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.043
Model:                            OLS   Adj. R-squared:                  0.039
Method:                 Least Squares   F-statistic:                     11.32
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           2.88e-07
Time:                        10:27:49   Log-Likelihood:                -219.19
No. Observations:                 763   AIC:                             446.4
Df Residuals:                     759   BIC:                             464.9
Df Model:                           3
Covariance Type:            nonrobust
================================================================================
=================
                                  coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                       2.4859      0.054     46.122      0.000
2.380       2.592
gender_Female                   1.2117      0.029     41.457      0.000
1.154       1.269
gender_Male                     1.2742      0.030     43.015      0.000
1.216       1.332
race_grouping_white            -0.1331      0.082     -1.624      0.105
-0.294       0.028
race_grouping_person_of_color  -0.2629      0.085     -3.105      0.002
-0.429      -0.097
==============================================================================
Omnibus:                       18.909   Durbin-Watson:                   1.865
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               19.811
Skew:                           0.394   Prob(JB):                     4.99e-05
Kurtosis:                       3.041   Cond. No.                     5.84e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.85e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[284]:

```
model18 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
↪'performance_rating ~ gender_Female + gender_Male + age_group_5_25_under +␣
↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result18 = model18.fit()
result18.summary()
```

[284]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.046
Model:                            OLS   Adj. R-squared:                  0.033
Method:                 Least Squares   F-statistic:                     3.588
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000114
Time:                        10:27:49   Log-Likelihood:                -218.10
No. Observations:                 763   AIC:                             458.2
Df Residuals:                     752   BIC:                             509.2
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept                2.2183      0.011    202.702      0.000       2.197
2.240
gender_Female            1.0816      0.013     81.967      0.000       1.056
1.107
gender_Male              1.1368      0.013     87.233      0.000       1.111
1.162
age_group_5_25_under    -0.0591      0.121     -0.489      0.625      -0.296
0.178
age_group_5_25to29       0.1312      0.040      3.286      0.001       0.053
0.210
age_group_5_30to34       0.1968      0.030      6.461      0.000       0.137
0.257
age_group_5_35to39       0.2457      0.032      7.720      0.000       0.183
0.308
age_group_5_40to44       0.2914      0.035      8.387      0.000       0.223
0.360
age_group_5_45to49       0.2170      0.038      5.715      0.000       0.142
0.292
age_group_5_50to54       0.2553      0.032      7.916      0.000       0.192
0.319
```

```
age_group_5_55to59       0.3077      0.036      8.563      0.000       0.237
0.378
age_group_5_60to64       0.2676      0.044      6.062      0.000       0.181
0.354
age_group_5_65_over      0.3648      0.052      7.082      0.000       0.264
0.466
==============================================================================
Omnibus:                       22.130   Durbin-Watson:                   1.879
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               23.546
Skew:                           0.430   Prob(JB):                     7.71e-06
Kurtosis:                       3.003   Cond. No.                     5.83e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 3.65e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[285]:

```
model19 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'performance_rating ~ race_grouping_white + race_grouping_person_of_color +␣
 ↪age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +␣
 ↪age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +␣
 ↪age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +␣
 ↪age_group_5_65_over')
result19 = model19.fit()
result19.summary()
```

[285]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.070
Model:                            OLS   Adj. R-squared:                  0.056
Method:                 Least Squares   F-statistic:                     5.124
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           8.91e-08
Time:                        10:27:49   Log-Likelihood:                -208.27
No. Observations:                 763   AIC:                             440.5
Df Residuals:                     751   BIC:                             496.2
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
```

```
Intercept                          3.3538      0.075     45.011      0.000
3.208       3.500
race_grouping_white               -0.1183      0.082     -1.443      0.149
-0.279       0.043
race_grouping_person_of_color     -0.2531      0.085     -2.995      0.003
-0.419      -0.087
age_group_5_25_under               0.0145      0.120      0.121      0.904
-0.221       0.250
age_group_5_25to29                 0.2464      0.040      6.189      0.000
0.168       0.324
age_group_5_30to34                 0.3228      0.031     10.429      0.000
0.262       0.384
age_group_5_35to39                 0.3714      0.032     11.469      0.000
0.308       0.435
age_group_5_40to44                 0.4239      0.034     12.295      0.000
0.356       0.492
age_group_5_45to49                 0.3275      0.038      8.568      0.000
0.252       0.402
age_group_5_50to54                 0.3891      0.033     11.832      0.000
0.325       0.454
age_group_5_55to59                 0.4180      0.036     11.531      0.000
0.347       0.489
age_group_5_60to64                 0.3757      0.044      8.554      0.000
0.290       0.462
age_group_5_65_over                0.4645      0.052      8.960      0.000
0.363       0.566
==============================================================================
Omnibus:                       15.402   Durbin-Watson:                   1.897
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               15.937
Skew:                           0.354   Prob(JB):                     0.000346
Kurtosis:                       3.028   Cond. No.                     3.34e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.22e-28. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[286]:
```
model20 = sm.ols(data=merit_raises_combined_salaried_regression, formula =
 ↪'performance_rating ~ gender_Female + gender_Male + race_grouping_white +
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +
 ↪age_group_5_60to64 + age_group_5_65_over')
result20 = model20.fit()
```

```
result20.summary()
```

[286]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.075
Model:                            OLS   Adj. R-squared:                  0.060
Method:                 Least Squares   F-statistic:                     5.031
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           4.32e-08
Time:                        10:27:49   Log-Likelihood:                -206.34
No. Observations:                 763   AIC:                             438.7
Df Residuals:                     750   BIC:                             499.0
Df Model:                          12
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         2.3092      0.051     45.135      0.000
2.209       2.410
gender_Female                     1.1315      0.028     40.697      0.000
1.077       1.186
gender_Male                       1.1777      0.029     41.247      0.000
1.122       1.234
race_grouping_white              -0.1256      0.082     -1.533      0.126
-0.286       0.035
race_grouping_person_of_color    -0.2545      0.084     -3.017      0.003
-0.420      -0.089
age_group_5_25_under             -0.0729      0.119     -0.610      0.542
-0.307       0.162
age_group_5_25to29                0.1473      0.040      3.716      0.000
0.069       0.225
age_group_5_30to34                0.2187      0.031      7.146      0.000
0.159       0.279
age_group_5_35to39                0.2665      0.032      8.329      0.000
0.204       0.329
age_group_5_40to44                0.3129      0.035      9.057      0.000
0.245       0.381
age_group_5_45to49                0.2210      0.038      5.838      0.000
0.147       0.295
age_group_5_50to54                0.2823      0.033      8.679      0.000
0.218       0.346
age_group_5_55to59                0.3102      0.036      8.637      0.000
0.240       0.381
```

```
age_group_5_60to64                0.2679      0.044      6.134      0.000
0.182       0.354
age_group_5_65_over               0.3553      0.051      6.907      0.000
0.254       0.456
==============================================================================
Omnibus:                       16.441   Durbin-Watson:                   1.888
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               17.123
Skew:                           0.367   Prob(JB):                     0.000191
Kurtosis:                       3.004   Cond. No.                     1.03e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.63e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[287]:

```
news_hourly_regression =␣
 ↪news_hourly[['department','gender','race_ethnicity','current_base_pay','job_profile_current
news_hourly_regression = pd.get_dummies(news_hourly_regression,␣
 ↪columns=['gender','race_ethnicity','age_group_5','years_of_service_grouped','dept','desk','
```

[288]:

```
news_hourly_regression = news_hourly_regression.
 ↪rename(columns={'race_grouping_person of color':
 ↪'race_grouping_person_of_color','age_group_5_<25':
 ↪'age_group_5_25_under','age_group_5_25-29':
 ↪'age_group_5_25to29','age_group_5_30-34':
 ↪'age_group_5_30to34','age_group_5_35-39':
 ↪'age_group_5_35to39','age_group_5_40-44':
 ↪'age_group_5_40to44','age_group_5_45-49':
 ↪'age_group_5_45to49','age_group_5_50-54':
 ↪'age_group_5_50to54','age_group_5_55-59':
 ↪'age_group_5_55to59','age_group_5_60-64':
 ↪'age_group_5_60to64','age_group_5_65+':'age_group_5_65_over','tier_Tier 1':
 ↪'tier_Tier_1','tier_Tier 2':'tier_Tier_2','tier_Tier 3':
 ↪'tier_Tier_3','tier_Tier 4':'tier_Tier_4','years_of_service_grouped_0':
 ↪'years_of_service_grouped_0','years_of_service_grouped_1-2':
 ↪'years_of_service_grouped_1to2','years_of_service_grouped_3-5':
 ↪'years_of_service_grouped_3to5','years_of_service_grouped_6-10':
 ↪'years_of_service_grouped_6to10','years_of_service_grouped_11-15':
 ↪'years_of_service_grouped_11to15','years_of_service_grouped_16-20':
 ↪'years_of_service_grouped_16to20','years_of_service_grouped_21-25':
 ↪'years_of_service_grouped_21to25','years_of_service_grouped_25+':
 ↪'years_of_service_grouped_25_over'})
import statsmodels.formula.api as sm
model21 = sm.ols(data=news_hourly_regression, formula = 'current_base_pay ~␣
 ↪gender_Female + gender_Male')
```

```
result21 = model2.fit()
result21.summary()
```

[288]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.043
Model:                            OLS   Adj. R-squared:                  0.040
Method:                 Least Squares   F-statistic:                     12.81
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           3.60e-06
Time:                        10:27:49   Log-Likelihood:                -6930.6
No. Observations:                 574   AIC:                         1.387e+04
Df Residuals:                     571   BIC:                         1.388e+04
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                 coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                   1.271e+05   7897.372     16.092      0.000
1.12e+05    1.43e+05
race_grouping_white        -6301.9244   8174.557     -0.771      0.441
-2.24e+04    9753.945
race_grouping_person_of_color -2.661e+04   8682.201     -3.065      0.002
-4.37e+04   -9560.605
==============================================================================
Omnibus:                      128.063   Durbin-Watson:                   1.632
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              248.772
Skew:                           1.253   Prob(JB):                     9.55e-55
Kurtosis:                       5.030   Cond. No.                         9.91
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[289]:
```
model22 = sm.ols(data=news_hourly_regression, formula = 'current_base_pay ~
 ↪race_grouping_white + race_grouping_person_of_color')
result22 = model22.fit()
result22.summary()
```

[289]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
```

```
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.051
Model:                            OLS   Adj. R-squared:                  0.030
Method:                 Least Squares   F-statistic:                     2.484
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0889
Time:                        10:27:49   Log-Likelihood:                -369.15
No. Observations:                  96   AIC:                             744.3
Df Residuals:                      93   BIC:                             752.0
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                  coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      39.2300      8.131      4.825      0.000
23.084      55.376
race_grouping_white            -3.6811      8.257     -0.446      0.657
-20.077      12.715
race_grouping_person_of_color  -9.0990      8.397     -1.084      0.281
-25.775       7.577
==============================================================================
Omnibus:                        5.387   Durbin-Watson:                   1.792
Prob(Omnibus):                  0.068   Jarque-Bera (JB):                4.797
Skew:                           0.527   Prob(JB):                       0.0909
Kurtosis:                       3.296   Cond. No.                         15.1
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[290]:
```
model23 = sm.ols(data=news_hourly_regression, formula = 'current_base_pay ~␣
 ↪gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color')
result23 = model23.fit()
result23.summary()
```

[290]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.065
Model:                            OLS   Adj. R-squared:                  0.034
Method:                 Least Squares   F-statistic:                     2.116
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.104
```

```
Time:                           10:27:49   Log-Likelihood:                -368.44
No. Observations:                     96   AIC:                             744.9
Df Residuals:                         92   BIC:                             755.1
Df Model:                              3
Covariance Type:               nonrobust
================================================================================
=================
                                coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                    25.1888      5.473      4.603      0.000
14.319      36.058
gender_Female                14.0412      2.829      4.964      0.000
8.423      19.659
gender_Male                  11.1476      3.171      3.516      0.001
4.851      17.445
race_grouping_white          -2.6412      8.289     -0.319      0.751
-19.104      13.821
race_grouping_person_of_color  -8.1345      8.422     -0.966      0.337
-24.861      8.592
==============================================================================
Omnibus:                       4.237   Durbin-Watson:                   1.806
Prob(Omnibus):                 0.120   Jarque-Bera (JB):                3.664
Skew:                          0.465   Prob(JB):                        0.160
Kurtosis:                      3.226   Cond. No.                     8.67e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.71e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[291]:

```
new_news_hourly_regression = pd.DataFrame({'gender_Female': [1,0,1,0],␣
 ↪'gender_Male': [0,1,0,1], 'race_grouping_white': [1,1,0,0],␣
 ↪'race_grouping_person_of_color': [0,0,1,1], 'age': [40,40,40,40]})
new_news_hourly_regression['predicted'] = result23.
 ↪predict(new_news_hourly_regression)
new_news_hourly_regression
```

[291]:

	gender_Female	gender_Male	race_grouping_white \
0	1	0	1
1	0	1	1
2	1	0	0
3	0	1	0

```
   race_grouping_person_of_color  age  predicted
0                              0   40      36.59
1                              0   40      33.70
2                              1   40      31.10
3                              1   40      28.20
```

[292]:

```
model24 = sm.ols(data=news_hourly_regression, formula = 'current_base_pay ~␣
 ↪gender_Female + gender_Male + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result24 = model24.fit()
result24.summary()
```

[292]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.331
Model:                            OLS   Adj. R-squared:                  0.253
Method:                 Least Squares   F-statistic:                     4.211
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           9.31e-05
Time:                        10:27:50   Log-Likelihood:                -352.33
No. Observations:                  96   AIC:                             726.7
Df Residuals:                      85   BIC:                             754.9
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept               22.4772      0.740     30.371      0.000      21.006
23.949
gender_Female           13.1035      1.128     11.614      0.000      10.860
15.347
gender_Male              9.3736      1.324      7.078      0.000       6.740
12.007
age_group_5_25_under    -8.8886      2.708     -3.282      0.001     -14.273
-3.504
age_group_5_25to29      -5.8755      2.191     -2.681      0.009     -10.232
-1.519
age_group_5_30to34      -0.5526      3.010     -0.184      0.855      -6.537
5.432
age_group_5_35to39      -2.4257      3.389     -0.716      0.476      -9.165
4.313
age_group_5_40to44       3.6126      3.220      1.122      0.265      -2.790
```

```
10.015
age_group_5_45to49      11.8836      3.640      3.265      0.002       4.647
19.120
age_group_5_50to54       3.3536      3.606      0.930      0.355      -3.816
10.523
age_group_5_55to59       1.9492      3.691      0.528      0.599      -5.389
9.288
age_group_5_60to64       7.9013      4.207      1.878      0.064      -0.464
16.267
age_group_5_65_over     11.5193      4.225      2.726      0.008       3.118
19.921
==============================================================================
Omnibus:                        0.505   Durbin-Watson:                   1.922
Prob(Omnibus):                  0.777   Jarque-Bera (JB):                0.653
Skew:                           0.092   Prob(JB):                        0.721
Kurtosis:                       2.640   Cond. No.                     2.33e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is  3e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[293]:

```
model25 = sm.ols(data=news_hourly_regression, formula = 'current_base_pay ~
 ↪race_grouping_white + race_grouping_person_of_color + age_group_5_25_under +
 ↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
 ↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
 ↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result25 = model25.fit()
result25.summary()
```

[293]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.337
Model:                            OLS   Adj. R-squared:                  0.250
Method:                 Least Squares   F-statistic:                     3.876
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000154
Time:                        10:27:50   Log-Likelihood:                -351.94
No. Observations:                  96   AIC:                             727.9
Df Residuals:                      84   BIC:                             758.7
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
```

```
                                      coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                          42.6892      6.752      6.322      0.000
29.261      56.117
race_grouping_white                -9.9644      7.492     -1.330      0.187
-24.862       4.933
race_grouping_person_of_color     -12.5342      7.657     -1.637      0.105
-27.762       2.693
age_group_5_25_under               -6.1759      2.703     -2.285      0.025
-11.552      -0.800
age_group_5_25to29                 -2.6518      2.389     -1.110      0.270
-7.403       2.100
age_group_5_30to34                 -0.7425      2.971     -0.250      0.803
-6.650       5.165
age_group_5_35to39                 -0.0048      3.496     -0.001      0.999
-6.958       6.948
age_group_5_40to44                  5.3819      3.318      1.622      0.108
-1.215      11.979
age_group_5_45to49                 14.5738      3.707      3.932      0.000
7.202      21.945
age_group_5_50to54                  5.8780      3.695      1.591      0.115
-1.470      13.226
age_group_5_55to59                  2.5081      3.707      0.677      0.501
-4.863       9.879
age_group_5_60to64                  9.2652      4.341      2.134      0.036
0.632      17.898
age_group_5_65_over                14.6572      4.305      3.404      0.001
6.096      23.219
==============================================================================
Omnibus:                        1.450   Durbin-Watson:                   1.945
Prob(Omnibus):                  0.484   Jarque-Bera (JB):                1.513
Skew:                           0.255   Prob(JB):                        0.469
Kurtosis:                       2.657   Cond. No.                     1.10e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.33e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[294]:

```python
model26 = sm.ols(data=news_hourly_regression, formula = 'current_base_pay ~␣
 ↪gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result26 = model26.fit()
result26.summary()
```

[294]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.351
Model:                            OLS   Adj. R-squared:                  0.257
Method:                 Least Squares   F-statistic:                     3.736
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000160
Time:                        10:27:50   Log-Likelihood:                -350.92
No. Observations:                  96   AIC:                             727.8
Df Residuals:                      83   BIC:                             761.2
Df Model:                          12
Covariance Type:            nonrobust
================================================================================
=================
                                   coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                       28.2477      4.693      6.019      0.000
18.913      37.582
gender_Female                   15.7092      2.436      6.449      0.000
10.864      20.554
gender_Male                     12.5385      2.807      4.466      0.000
6.955      18.122
race_grouping_white             -8.6864      7.517     -1.156      0.251
-23.638       6.265
race_grouping_person_of_color  -11.0211      7.705     -1.430      0.156
-26.345       4.303
age_group_5_25_under            -8.2781      2.745     -3.016      0.003
-13.737      -2.819
age_group_5_25to29              -4.4931      2.358     -1.905      0.060
-9.183       0.197
age_group_5_30to34              -1.1757      3.034     -0.387      0.699
-7.211       4.859
age_group_5_35to39              -1.4497      3.439     -0.421      0.674
-8.291       5.391
age_group_5_40to44               4.1931      3.261      1.286      0.202
```

```
-2.293      10.679
age_group_5_45to49             12.4474      3.696      3.367      0.001
5.095      19.800
age_group_5_50to54              4.1710      3.648      1.143      0.256
-3.084      11.426
age_group_5_55to59              2.1935      3.727      0.588      0.558
-5.220       9.607
age_group_5_60to64              7.9878      4.282      1.865      0.066
-0.530      16.505
age_group_5_65_over            12.6515      4.276      2.959      0.004
4.147      21.156
==============================================================================
Omnibus:                        0.670   Durbin-Watson:                   1.944
Prob(Omnibus):                  0.715   Jarque-Bera (JB):                0.804
Skew:                           0.145   Prob(JB):                        0.669
Kurtosis:                       2.658   Cond. No.                     1.52e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 9.29e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[295]:
```python
model27 = sm.ols(data=news_hourly_regression, formula = 'current_base_pay ~␣
↪gender_Female + gender_Male + race_grouping_white +␣
↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
↪age_group_5_60to64 + age_group_5_65_over + tier_Tier_1 + tier_Tier_2 +␣
↪tier_Tier_3 + tier_Tier_4')
result27 = model27.fit()
result27.summary()
```

[295]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.425
Model:                            OLS   Adj. R-squared:                  0.309
Method:                 Least Squares   F-statistic:                     3.656
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           5.89e-05
Time:                        10:27:50   Log-Likelihood:                -345.05
No. Observations:                  96   AIC:                             724.1
Df Residuals:                      79   BIC:                             767.7
Df Model:                          16
Covariance Type:            nonrobust
```

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	34.4064	5.313	6.476	0.000	23.831	44.982
gender_Female	19.0722	2.796	6.822	0.000	13.507	24.637
gender_Male	15.3342	2.992	5.125	0.000	9.379	21.289
race_grouping_white	-7.5095	7.386	-1.017	0.312	-22.211	7.192
race_grouping_person_of_color	-11.2049	7.615	-1.471	0.145	-26.362	3.952
age_group_5_25_under	-7.8299	2.675	-2.927	0.004	-13.154	-2.506
age_group_5_25to29	-5.5331	2.385	-2.320	0.023	-10.280	-0.786
age_group_5_30to34	-1.8309	2.974	-0.616	0.540	-7.750	4.088
age_group_5_35to39	-1.2639	3.350	-0.377	0.707	-7.931	5.403
age_group_5_40to44	5.1850	3.198	1.622	0.109	-1.180	11.550
age_group_5_45to49	13.6650	3.609	3.786	0.000	6.481	20.849
age_group_5_50to54	5.6363	3.587	1.571	0.120	-1.504	12.777
age_group_5_55to59	4.2840	3.700	1.158	0.250	-3.082	11.650
age_group_5_60to64	7.7412	4.225	1.832	0.071	-0.669	16.152
age_group_5_65_over	14.3528	4.165	3.446	0.001	6.062	22.643
tier_Tier_1	-9.5152	4.919	-1.934	0.057	-19.306	0.276
tier_Tier_2	-13.2592	4.296	-3.086	0.003	-21.810	-4.708
tier_Tier_3	-9.4182	4.290	-2.195	0.031	-17.957	-0.879
tier_Tier_4	-7.6206	10.569	-0.721	0.473	-28.658	13.417

Omnibus:	0.381	Durbin-Watson:	1.809
Prob(Omnibus):	0.827	Jarque-Bera (JB):	0.242

```
Skew:                           0.123   Prob(JB):                        0.886
Kurtosis:                       3.000   Cond. No.                     1.99e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 6.25e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[296]:
```
model28 = sm.ols(data=news_hourly_regression, formula = 'current_base_pay ~␣
 ↪gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over + tier_Tier_1 + tier_Tier_2 +␣
 ↪tier_Tier_3 + tier_Tier_4 + years_of_service_grouped_0 +␣
 ↪years_of_service_grouped_1to2 + years_of_service_grouped_3to5 +␣
 ↪years_of_service_grouped_6to10 + years_of_service_grouped_11to15 +␣
 ↪years_of_service_grouped_16to20 + years_of_service_grouped_21to25 +␣
 ↪years_of_service_grouped_25_over')
result28 = model28.fit()
result28.summary()
```

[296]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.443
Model:                            OLS   Adj. R-squared:                  0.266
Method:                 Least Squares   F-statistic:                     2.494
Date:                Wed, 06 Nov 2019   Prob (F-statistic):            0.00173
Time:                        10:27:50   Log-Likelihood:                -343.52
No. Observations:                  96   AIC:                             735.0
Df Residuals:                      72   BIC:                             796.6
Df Model:                          23
Covariance Type:            nonrobust
================================================================================
====================
                                      coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
--------------------
Intercept                          32.4885      5.312      6.116      0.000
21.900      43.077
gender_Female                      18.2562      2.768      6.596      0.000
12.738      23.774
```

```
gender_Male                         14.2324      3.105      4.584      0.000
8.042      20.422
race_grouping_white                 -8.7651      7.960     -1.101      0.275
-24.634       7.103
race_grouping_person_of_color      -12.3227      8.173     -1.508      0.136
-28.615       3.969
age_group_5_25_under               -10.2986      4.405     -2.338      0.022
-19.079      -1.518
age_group_5_25to29                  -7.6966      4.002     -1.923      0.058
-15.674       0.281
age_group_5_30to34                  -3.6324      3.639     -0.998      0.322
-10.888       3.623
age_group_5_35to39                  -2.4335      3.749     -0.649      0.518
-9.908       5.041
age_group_5_40to44                   5.1931      3.533      1.470      0.146
-1.851      12.237
age_group_5_45to49                  13.9918      4.500      3.109      0.003
5.020      22.963
age_group_5_50to54                   7.0912      4.119      1.721      0.089
-1.120      15.303
age_group_5_55to59                   5.1000      4.027      1.267      0.209
-2.927      13.127
age_group_5_60to64                  10.3023      5.229      1.970      0.053
-0.121      20.725
age_group_5_65_over                 14.8714      4.638      3.207      0.002
5.626      24.117
tier_Tier_1                         -9.6000      5.224     -1.838      0.070
-20.014       0.814
tier_Tier_2                        -12.9480      4.517     -2.867      0.005
-21.952      -3.944
tier_Tier_3                         -9.7998      4.564     -2.147      0.035
-18.899      -0.701
tier_Tier_4                         -6.9480     12.118     -0.573      0.568
-31.105      17.209
years_of_service_grouped_0           5.5195      4.055      1.361      0.178
-2.564      13.603
years_of_service_grouped_1to2        7.0368      3.627      1.940      0.056
-0.193      14.266
years_of_service_grouped_3to5        4.9818      3.862      1.290      0.201
-2.718      12.681
years_of_service_grouped_6to10       5.3426      3.056      1.748      0.085
-0.750      11.435
years_of_service_grouped_11to15      5.0292      3.876      1.298      0.199
-2.697      12.755
years_of_service_grouped_16to20     -0.1816      3.514     -0.052      0.959
-7.186       6.823
years_of_service_grouped_21to25      3.0822      5.187      0.594      0.554
```

```
-7.257      13.421
years_of_service_grouped_25_over     1.6782      5.633      0.298      0.767
-9.551      12.908
==============================================================================
Omnibus:                        1.708   Durbin-Watson:                   1.904
Prob(Omnibus):                  0.426   Jarque-Bera (JB):                1.177
Skew:                           0.239   Prob(JB):                        0.555
Kurtosis:                       3.257   Cond. No.                     1.41e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.32e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[297]:
```
merit_raises_combined_hourly_regression =␣
↪merit_raises_combined[(merit_raises_combined['dept'] == 'News') &␣
↪(merit_raises_combined['pay_rate_type'] == 'Hourly')]
merit_raises_combined_hourly_regression = pd.
↪get_dummies(merit_raises_combined_hourly_regression,␣
↪columns=['gender','race_grouping','age_group_5'])
```

[298]:
```
merit_raises_combined_hourly_regression =␣
↪merit_raises_combined_hourly_regression.
↪rename(columns={'race_grouping_person of color':
↪'race_grouping_person_of_color','age_group_5_<25':
↪'age_group_5_25_under','age_group_5_25-29':
↪'age_group_5_25to29','age_group_5_30-34':
↪'age_group_5_30to34','age_group_5_35-39':
↪'age_group_5_35to39','age_group_5_40-44':
↪'age_group_5_40to44','age_group_5_45-49':
↪'age_group_5_45to49','age_group_5_50-54':
↪'age_group_5_50to54','age_group_5_55-59':
↪'age_group_5_55to59','age_group_5_60-64':
↪'age_group_5_60to64','age_group_5_65+':'age_group_5_65_over'})
model29 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
↪'base_pay_change ~ gender_Female + gender_Male')
result29 = model29.fit()
result29.summary()
```

[298]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.010
Model:                            OLS   Adj. R-squared:                  0.001
```

```
Method:                 Least Squares   F-statistic:                     1.130
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.290
Time:                        10:27:50   Log-Likelihood:                -217.43
No. Observations:                 119   AIC:                             438.9
Df Residuals:                     117   BIC:                             444.4
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                    coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept         1.0256      0.095     10.816      0.000       0.838
1.213
gender_Female     0.6640      0.140      4.737      0.000       0.386
0.942
gender_Male       0.3616      0.159      2.273      0.025       0.047
0.677
==============================================================================
Omnibus:                      140.664   Durbin-Watson:                   1.822
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             3520.132
Skew:                           4.181   Prob(JB):                         0.00
Kurtosis:                      28.299   Cond. No.                     2.84e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.25e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[299]:
```
model30 = sm.ols(data=merit_raises_combined_hourly_regression, formula =
 ↪'base_pay_change ~ race_grouping_white + race_grouping_person_of_color')
result30 = model30.fit()
result30.summary()
```

[299]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.030
Model:                            OLS   Adj. R-squared:                  0.021
Method:                 Least Squares   F-statistic:                     3.581
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0609
Time:                        10:27:50   Log-Likelihood:                -216.21
No. Observations:                 119   AIC:                             436.4
```

```
Df Residuals:                     117   BIC:                             442.0
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=================
                                 coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      0.9759      0.099      9.846      0.000
0.780       1.172
race_grouping_white            0.7693      0.138      5.583      0.000
0.496       1.042
race_grouping_person_of_color     0.2066      0.174      1.190      0.236
-0.137       0.550
==============================================================================
Omnibus:                      140.033   Durbin-Watson:                   1.726
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             3604.750
Skew:                           4.131   Prob(JB):                         0.00
Kurtosis:                      28.666   Cond. No.                     4.70e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 8.62e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[300]:
```
model31 = sm.ols(data=merit_raises_combined_hourly_regression, formula =
 ↪'base_pay_change ~ gender_Female + gender_Male + race_grouping_white +
 ↪race_grouping_person_of_color')
result31 = model31.fit()
result31.summary()
```

[300]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.035
Model:                            OLS   Adj. R-squared:                  0.018
Method:                 Least Squares   F-statistic:                     2.084
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.129
Time:                        10:27:50   Log-Likelihood:                -215.90
No. Observations:                 119   AIC:                             437.8
Df Residuals:                     116   BIC:                             446.1
Df Model:                           2
Covariance Type:            nonrobust
```

```
==============================================================================
=================
                               coef    std err          t      P>|t|
[0.025      0.975]
------------------------------------------------------------------------------
-----------------
Intercept                    0.7239      0.075      9.628      0.000
0.575       0.873
gender_Female                0.4726      0.143      3.312      0.001
0.190       0.755
gender_Male                  0.2512      0.153      1.645      0.103
-0.051       0.554
race_grouping_white          0.6242      0.142      4.386      0.000
0.342       0.906
race_grouping_person_of_color     0.0996      0.168      0.594      0.554
-0.233       0.432
==============================================================================
Omnibus:                      138.940   Durbin-Watson:                   1.699
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             3489.086
Skew:                           4.091   Prob(JB):                         0.00
Kurtosis:                      28.234   Cond. No.                     5.77e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 7.58e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[301]:

```
new_reason_for_change_combined_regression = pd.DataFrame({'gender_Female':␣
 ↪[1,0,1,0], 'gender_Male': [0,1,0,1], 'race_grouping_white': [1,1,0,0],␣
 ↪'race_grouping_person_of_color': [0,0,1,1]})
new_reason_for_change_combined_regression['predicted'] = result31.
 ↪predict(new_reason_for_change_combined_regression)
new_reason_for_change_combined_regression
```

[301]:

```
   gender_Female  gender_Male  race_grouping_white  \
0              1            0                    1
1              0            1                    1
2              1            0                    0
3              0            1                    0

   race_grouping_person_of_color  predicted
0                              0       1.82
1                              0       1.60
2                              1       1.30
3                              1       1.07
```

[302]:
```
model32 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
↪'base_pay_change ~ gender_Female + gender_Male + age_group_5_25_under +␣
↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result32 = model32.fit()
result32.summary()
```

[302]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.076
Model:                            OLS   Adj. R-squared:                 -0.010
Method:                 Least Squares   F-statistic:                    0.8829
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.552
Time:                        10:27:50   Log-Likelihood:                -213.33
No. Observations:                 119   AIC:                             448.7
Df Residuals:                     108   BIC:                             479.2
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept                0.9858      0.109      9.020      0.000       0.769
1.202
gender_Female            0.6158      0.155      3.964      0.000       0.308
0.924
gender_Male              0.3701      0.173      2.135      0.035       0.027
0.714
age_group_5_25_under    -0.9278      0.814     -1.140      0.257      -2.541
0.686
age_group_5_25to29       0.1217      0.330      0.369      0.713      -0.532
0.775
age_group_5_30to34       0.1034      0.365      0.284      0.777      -0.619
0.826
age_group_5_35to39      -0.1446      0.429     -0.337      0.737      -0.996
0.707
age_group_5_40to44       0.2296      0.429      0.535      0.594      -0.622
1.081
age_group_5_45to49       0.0921      0.381      0.242      0.809      -0.663
0.847
age_group_5_50to54      -0.1722      0.422     -0.409      0.684      -1.008
0.663
```

```
age_group_5_55to59      -0.1867      0.447     -0.418      0.677      -1.073
0.699
age_group_5_60to64       1.8448      0.708      2.606      0.010       0.442
3.248
age_group_5_65_over      0.0256      0.639      0.040      0.968      -1.241
1.292
==============================================================================
Omnibus:                      146.672   Durbin-Watson:                   1.806
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             4436.142
Skew:                           4.377   Prob(JB):                         0.00
Kurtosis:                      31.601   Cond. No.                     1.24e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.28e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[303]:
```python
model33 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
↪'base_pay_change ~ race_grouping_white + race_grouping_person_of_color +␣
↪age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +␣
↪age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +␣
↪age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +␣
↪age_group_5_65_over')
result33 = model33.fit()
result33.summary()
```

[303]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.098
Model:                            OLS   Adj. R-squared:                  0.015
Method:                 Least Squares   F-statistic:                     1.176
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.315
Time:                        10:27:51   Log-Likelihood:                -211.85
No. Observations:                 119   AIC:                             445.7
Df Residuals:                     108   BIC:                             476.3
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
```

```
Intercept                            0.9191      0.115      7.971      0.000
0.691       1.148
race_grouping_white                  0.7541      0.148      5.084      0.000
0.460       1.048
race_grouping_person_of_color        0.1650      0.191      0.866      0.389
-0.213       0.543
age_group_5_25_under                -1.1631      0.806     -1.444      0.152
-2.760       0.434
age_group_5_25to29                   0.2934      0.327      0.898      0.371
-0.354       0.941
age_group_5_30to34                  -0.0743      0.355     -0.209      0.835
-0.778       0.630
age_group_5_35to39                  -0.0445      0.428     -0.104      0.918
-0.894       0.805
age_group_5_40to44                   0.1334      0.425      0.314      0.754
-0.709       0.976
age_group_5_45to49                   0.1278      0.375      0.341      0.734
-0.616       0.871
age_group_5_50to54                  -0.1457      0.409     -0.356      0.723
-0.957       0.666
age_group_5_55to59                  -0.1780      0.440     -0.405      0.687
-1.050       0.694
age_group_5_60to64                   1.7119      0.704      2.433      0.017
0.317       3.107
age_group_5_65_over                  0.2583      0.636      0.406      0.685
-1.002       1.518
==============================================================================
Omnibus:                      142.251   Durbin-Watson:                   1.706
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             4046.992
Skew:                           4.185   Prob(JB):                         0.00
Kurtosis:                      30.316   Cond. No.                     1.68e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 7.27e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[304]:

```python
model34 = sm.ols(data=merit_raises_combined_hourly_regression, formula =
 ↪'base_pay_change ~ gender_Female + gender_Male + race_grouping_white +
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +
 ↪age_group_5_60to64 + age_group_5_65_over')
result34 = model34.fit()
```

```
result34.summary()
```

[304]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.099
Model:                            OLS   Adj. R-squared:                  0.006
Method:                 Least Squares   F-statistic:                     1.069
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.393
Time:                        10:27:51   Log-Likelihood:                -211.80
No. Observations:                 119   AIC:                             447.6
Df Residuals:                     107   BIC:                             480.9
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                   coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                        0.6987      0.088      7.906      0.000
0.523       0.874
gender_Female                    0.3987      0.164      2.437      0.016
0.074       0.723
gender_Male                      0.2999      0.169      1.779      0.078
-0.034       0.634
race_grouping_white              0.6296      0.158      3.992      0.000
0.317       0.942
race_grouping_person_of_color    0.0691      0.188      0.367      0.714
-0.304       0.442
age_group_5_25_under            -1.1511      0.815     -1.412      0.161
-2.768       0.465
age_group_5_25to29               0.2459      0.339      0.725      0.470
-0.427       0.919
age_group_5_30to34              -0.0636      0.372     -0.171      0.865
-0.802       0.675
age_group_5_35to39              -0.0632      0.431     -0.147      0.884
-0.917       0.791
age_group_5_40to44               0.1242      0.429      0.289      0.773
-0.726       0.975
age_group_5_45to49               0.0959      0.379      0.253      0.801
-0.655       0.847
age_group_5_50to54              -0.1909      0.418     -0.456      0.649
-1.020       0.639
age_group_5_55to59              -0.1884      0.444     -0.425      0.672
-1.068       0.691
```

```
age_group_5_60to64                 1.6827      0.706      2.382      0.019
0.282       3.083
age_group_5_65_over                0.2071      0.645      0.321      0.749
-1.072       1.486
==============================================================================
Omnibus:                      142.272   Durbin-Watson:                   1.701
Prob(Omnibus):                  0.000   Jarque-Bera (JB):             4047.261
Skew:                           4.186   Prob(JB):                         0.00
Kurtosis:                      30.316   Cond. No.                     1.99e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 6.75e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[305]:

```
model35 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'performance_rating ~ gender_Female + gender_Male')
result35 = model35.fit()
result35.summary()
```

[305]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.004
Model:                            OLS   Adj. R-squared:                 -0.005
Method:                 Least Squares   F-statistic:                    0.4057
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.526
Time:                        10:27:51   Log-Likelihood:                -40.137
No. Observations:                 111   AIC:                             84.27
Df Residuals:                     109   BIC:                             89.69
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                    coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept         2.3463      0.023    103.057      0.000       2.301
2.391
gender_Female     1.1949      0.033     35.693      0.000       1.129
1.261
gender_Male       1.1514      0.038     30.021      0.000       1.075
1.227
```

```
==============================================================================
Omnibus:                        7.442   Durbin-Watson:                   2.088
Prob(Omnibus):                  0.024   Jarque-Bera (JB):                6.902
Skew:                           0.544   Prob(JB):                       0.0317
Kurtosis:                       2.444   Cond. No.                     3.47e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.41e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[306]:
```python
model36 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
→'performance_rating ~ race_grouping_white + race_grouping_person_of_color')
result36 = model36.fit()
result36.summary()
```

[306]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.044
Model:                            OLS   Adj. R-squared:                  0.035
Method:                 Least Squares   F-statistic:                     4.968
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0279
Time:                        10:27:51   Log-Likelihood:                -37.869
No. Observations:                 111   AIC:                             79.74
Df Residuals:                     109   BIC:                             85.16
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         2.3314      0.023    100.433      0.000
2.285       2.377
race_grouping_white               1.2433      0.033     38.131      0.000
1.179       1.308
race_grouping_person_of_color     1.0881      0.040     26.941      0.000
1.008       1.168
==============================================================================
Omnibus:                        4.850   Durbin-Watson:                   2.092
Prob(Omnibus):                  0.088   Jarque-Bera (JB):                4.227
Skew:                           0.391   Prob(JB):                        0.121
```

```
Kurtosis:                       2.451   Cond. No.                    3.50e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.44e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[307]:
```
model37 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'performance_rating ~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color')
result37 = model37.fit()
result37.summary()
```

[307]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.044
Model:                            OLS   Adj. R-squared:                  0.026
Method:                 Least Squares   F-statistic:                     2.484
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0882
Time:                        10:27:51   Log-Likelihood:                -37.847
No. Observations:                 111   AIC:                             81.69
Df Residuals:                     108   BIC:                             89.82
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         1.7480      0.018     98.864      0.000
1.713       1.783
gender_Female                     0.8811      0.034     25.816      0.000
0.813       0.949
gender_Male                       0.8668      0.037     23.645      0.000
0.794       0.940
race_grouping_white               0.9501      0.034     27.947      0.000
0.883       1.018
race_grouping_person_of_color     0.7979      0.039     20.276      0.000
0.720       0.876
==============================================================================
Omnibus:                        5.045   Durbin-Watson:                   2.099
Prob(Omnibus):                  0.080   Jarque-Bera (JB):                4.403
```

```
Skew:                           0.402   Prob(JB):                        0.111
Kurtosis:                       2.448   Cond. No.                     2.18e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.93e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[308]:
```
model38 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'performance_rating ~ gender_Female + gender_Male + age_group_5_25_under +␣
 ↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
 ↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
 ↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result38 = model38.fit()
result38.summary()
```

[308]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.136
Model:                            OLS   Adj. R-squared:                  0.050
Method:                 Least Squares   F-statistic:                     1.574
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.125
Time:                        10:27:51   Log-Likelihood:                -32.232
No. Observations:                 111   AIC:                             86.46
Df Residuals:                     100   BIC:                             116.3
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept                2.1848      0.027     80.675      0.000       2.131
2.238
gender_Female            1.1135      0.037     30.395      0.000       1.041
1.186
gender_Male              1.0713      0.041     26.028      0.000       0.990
1.153
age_group_5_25_under     0.0228      0.221      0.103      0.918      -0.416
0.461
age_group_5_25to29       0.1814      0.076      2.396      0.018       0.031
0.332
```

```
age_group_5_30to34        0.2256       0.087      2.580      0.011       0.052
0.399
age_group_5_35to39        0.0520       0.101      0.513      0.609      -0.149
0.253
age_group_5_40to44        0.5228       0.098      5.360      0.000       0.329
0.716
age_group_5_45to49        0.2274       0.087      2.620      0.010       0.055
0.400
age_group_5_50to54        0.3303       0.100      3.303      0.001       0.132
0.529
age_group_5_55to59        0.3030       0.111      2.741      0.007       0.084
0.522
age_group_5_60to64        0.0492       0.182      0.270      0.788      -0.312
0.410
age_group_5_65_over       0.2702       0.144      1.878      0.063      -0.015
0.556
==============================================================================
Omnibus:                        4.456   Durbin-Watson:                   2.073
Prob(Omnibus):                  0.108   Jarque-Bera (JB):                3.765
Skew:                           0.354   Prob(JB):                        0.152
Kurtosis:                       2.440   Cond. No.                     1.51e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 8.12e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[309]:
```
model39 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'performance_rating ~ race_grouping_white + race_grouping_person_of_color +␣
 ↪age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +␣
 ↪age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +␣
 ↪age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +␣
 ↪age_group_5_65_over')
result39 = model39.fit()
result39.summary()
```

[309]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.164
Model:                            OLS   Adj. R-squared:                  0.080
Method:                 Least Squares   F-statistic:                     1.960
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0457
Time:                        10:27:51   Log-Likelihood:                -30.408
```

```
No. Observations:                 111   AIC:                             82.82
Df Residuals:                     100   BIC:                             112.6
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
=================
                                   coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                        2.1685      0.028     77.356      0.000
2.113       2.224
race_grouping_white              1.1544      0.034     33.766      0.000
1.087       1.222
race_grouping_person_of_color    1.0141      0.044     23.298      0.000
0.928       1.100
age_group_5_25_under            -0.0229      0.218     -0.105      0.917
-0.456       0.410
age_group_5_25to29               0.2181      0.075      2.921      0.004
0.070       0.366
age_group_5_30to34               0.1877      0.084      2.230      0.028
0.021       0.355
age_group_5_35to39               0.0809      0.101      0.802      0.424
-0.119       0.281
age_group_5_40to44               0.5005      0.096      5.205      0.000
0.310       0.691
age_group_5_45to49               0.2335      0.085      2.741      0.007
0.064       0.402
age_group_5_50to54               0.3372      0.096      3.522      0.001
0.147       0.527
age_group_5_55to59               0.3017      0.108      2.789      0.006
0.087       0.516
age_group_5_60to64               0.0105      0.180      0.058      0.954
-0.347       0.368
age_group_5_65_over              0.3213      0.142      2.255      0.026
0.039       0.604
==============================================================================
Omnibus:                        3.523   Durbin-Watson:                   2.050
Prob(Omnibus):                  0.172   Jarque-Bera (JB):                2.913
Skew:                           0.285   Prob(JB):                        0.233
Kurtosis:                       2.448   Cond. No.                     2.68e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.66e-31. This might indicate that there are
```

```
strong multicollinearity problems or that the design matrix is singular.
"""
```

[310]:
```
model40 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'performance_rating ~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result40 = model40.fit()
result40.summary()
```

[310]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.164
Model:                            OLS   Adj. R-squared:                  0.071
Method:                 Least Squares   F-statistic:                     1.764
Date:                Wed, 06 Nov 2019   Prob (F-statistic):             0.0705
Time:                        10:27:51   Log-Likelihood:                -30.408
No. Observations:                 111   AIC:                             84.82
Df Residuals:                      99   BIC:                             117.3
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                   coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                        1.6522      0.022     76.828      0.000
1.610       1.695
gender_Female                    0.8254      0.039     21.212      0.000
0.748       0.903
gender_Male                      0.8268      0.040     20.585      0.000
0.747       0.907
race_grouping_white              0.8965      0.037     24.406      0.000
0.824       0.969
race_grouping_person_of_color    0.7557      0.043     17.447      0.000
0.670       0.842
age_group_5_25_under            -0.0748      0.220     -0.340      0.734
-0.511       0.361
age_group_5_25to29               0.1668      0.078      2.144      0.034
0.012       0.321
age_group_5_30to34               0.1356      0.089      1.521      0.131
-0.041       0.312
age_group_5_35to39               0.0292      0.102      0.287      0.775
```

```
-0.173       0.231
age_group_5_40to44              0.4487      0.097      4.610      0.000
0.256       0.642
age_group_5_45to49              0.1820      0.086      2.114      0.037
0.011       0.353
age_group_5_50to54              0.2860      0.099      2.887      0.005
0.089       0.483
age_group_5_55to59              0.2498      0.109      2.285      0.024
0.033       0.467
age_group_5_60to64             -0.0412      0.181     -0.228      0.820
-0.400       0.318
age_group_5_65_over             0.2701      0.145      1.863      0.065
-0.018       0.558
==============================================================================
Omnibus:                        3.487   Durbin-Watson:                   2.049
Prob(Omnibus):                  0.175   Jarque-Bera (JB):                2.890
Skew:                           0.284   Prob(JB):                        0.236
Kurtosis:                       2.450   Cond. No.                     3.49e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.05e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

1.6 Commercial

1.6.1 Gender

[311]:
```
current_commercial_gender_salaried = commercial_salaried.groupby(['gender']).
    ↪agg({'current_base_pay': [np.count_nonzero]})
suppress(current_commercial_gender_salaried)
```

[311]:
```
        count_nonzero
gender
Female          86.00
Male            47.00
```

[312]:
```
current_commercial_gender_hourly = commercial_hourly.groupby(['gender']).
    ↪agg({'current_base_pay': [np.count_nonzero]})
suppress(current_commercial_gender_hourly)
```

[312]:
```
        count_nonzero
gender
Female          74.00
Male            73.00
```

[313]:
```
current_commercial_gender_salaried_median = commercial_salaried.
↪groupby(['gender']).agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_gender_salaried_median)
```

[313]:
```
        count_nonzero   median
gender
Female          86.00 85977.35
Male            47.00 86880.00
```

[314]:
```
current_commercial_gender_hourly_median = commercial_hourly.groupby(['gender']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_gender_hourly_median)
```

[314]:
```
        count_nonzero  median
gender
Female          74.00   28.89
Male            73.00   23.45
```

[315]:
```
current_commercial_gender_age_salaried = commercial_salaried.
↪groupby(['gender'])['age'].median().sort_values(ascending=False)
current_commercial_gender_age_salaried
```

[315]:
```
gender
Male     39.00
Female   32.00
Name: age, dtype: float64
```

[316]:
```
current_commercial_gender_age_hourly = commercial_hourly.
↪groupby(['gender'])['age'].median().sort_values(ascending=False)
current_commercial_gender_age_hourly
```

[316]:
```
gender
Male     47.00
Female   43.50
Name: age, dtype: float64
```

[317]:
```
current_commercial_gender_age_5_salary = commercial_salaried.
↪groupby(['age_group_5','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_commercial_gender_age_5_salary)
```

[317]:
```
                    count_nonzero    median
age_group_5 gender
<25         Female           8.00  63500.00
25-29       Female          29.00  75000.00
            Male             6.00  79140.00
30-34       Female           9.00 100000.00
            Male             7.00  97695.60
35-39       Female           9.00 149101.00
            Male             9.00  77626.78
40-44       Female           8.00 124287.97
```

```
45-49         Female            7.00  90585.00
              Male              6.00  85089.96
50-54         Female            7.00  90669.48
55-59         Female            5.00  96780.00
              Male              5.00  97134.77
60-64         Male              6.00  95753.93
```

[318]:
```
current_commercial_gender_age_5_hourly = commercial_hourly.
 ↪groupby(['age_group_5','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_gender_age_5_hourly)
```

[318]:
```
                    count_nonzero  median
age_group_5 gender
<25         Male             7.00   23.08
25-29       Female          14.00   31.76
            Male             8.00   26.17
30-34       Female           6.00   30.32
35-39       Female           5.00   30.77
            Male             8.00   30.62
40-44       Female          12.00   29.48
            Male             5.00   21.50
45-49       Female           7.00   31.28
            Male            10.00   22.39
50-54       Female           6.00   23.27
            Male            12.00   24.15
55-59       Female           9.00   26.41
            Male             7.00   23.45
60-64       Female           6.00   24.51
            Male             7.00   24.27
65+         Female           5.00   27.69
            Male             6.00   22.73
```

[319]:
```
current_commercial_gender_age_10_salary = commercial_salaried.
 ↪groupby(['age_group_10','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_gender_age_10_salary)
```

[319]:
```
                     count_nonzero    median
age_group_10 gender
<25          Female           8.00  63500.00
25-34        Female          38.00  80212.00
             Male            13.00  86880.00
35-44        Female          17.00 143575.94
             Male            10.00  84029.11
45-54        Female          14.00  90627.24
             Male             9.00  85000.00
55-64        Female           9.00  96780.00
             Male            11.00  97134.77
```

[320]:
```
current_commercial_gender_age_10_hourly = commercial_hourly.
 ↪groupby(['age_group_10','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_gender_age_10_hourly)
```

[320]:
```
                         count_nonzero  median
age_group_10 gender
<25          Male                 7.00   23.08
25-34        Female              20.00   31.03
             Male                11.00   26.04
35-44        Female              17.00   29.74
             Male                13.00   27.18
45-54        Female              13.00   26.14
             Male                22.00   23.49
55-64        Female              15.00   25.36
             Male                14.00   23.86
65+          Female               5.00   27.69
             Male                 6.00   22.73
```

[321]:
```
current_commercial_gender_salaried_under_40 =␣
 ↪commercial_salaried[commercial_salaried['age'] < 40].groupby(['gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_gender_salaried_under_40)
```

[321]:
```
        count_nonzero   median
gender
Female          55.00 80424.00
Male            24.00 83140.00
```

[322]:
```
current_commercial_gender_salaried_over_40 =␣
 ↪commercial_salaried[commercial_salaried['age'] > 39].groupby(['gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_gender_salaried_over_40)
```

[322]:
```
        count_nonzero   median
gender
Female          31.00 96780.00
Male            23.00 90000.00
```

[323]:
```
current_commercial_gender_hourly_under_40 =␣
 ↪commercial_hourly[commercial_hourly['age'] < 40].groupby(['gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_gender_hourly_under_40)
```

[323]:
```
        count_nonzero  median
gender
Female          29.00   30.38
Male            26.00   26.53
```

[324]:
```
current_commercial_gender_hourly_over_40 =␣
↪commercial_hourly[commercial_hourly['age'] > 39].groupby(['gender']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_gender_hourly_over_40)
```

[324]:
```
        count_nonzero  median
gender
Female          45.00   27.69
Male            47.00   23.20
```

1.6.2 Race and ethnicity

[325]:
```
current_commercial_race_salaried = commercial_salaried.
↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_commercial_race_salaried)
```

[325]:
```
                                                    count_nonzero
race_ethnicity
White (United States of America)                            99.00
Black or African American (United States of Ame...          14.00
Asian (United States of America)                            13.00
Hispanic or Latino (United States of America)                5.00
```

[326]:
```
current_commercial_race_hourly = commercial_hourly.groupby(['race_ethnicity']).
↪agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_commercial_race_hourly)
```

[326]:
```
                                                    count_nonzero
race_ethnicity
Black or African American (United States of Ame...          82.00
White (United States of America)                            43.00
Hispanic or Latino (United States of America)                9.00
Asian (United States of America)                             7.00
```

[327]:
```
current_commercial_race_group_salaried = commercial_salaried.
↪groupby(['race_grouping']).agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_commercial_race_group_salaried)
```

[327]:
```
                 count_nonzero
race_grouping
white                    99.00
person of color          32.00
```

[328]:
```
current_commercial_race_group_hourly = commercial_hourly.
↪groupby(['race_grouping']).agg({'current_base_pay': [np.count_nonzero]})
suppress_count(current_commercial_race_group_hourly)
```

[328]:
```
                 count_nonzero
race_grouping
person of color         101.00
```

```
white                          43.00
```

[329]:
```
current_commercial_race_median_salaried = commercial_salaried.
 ↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_commercial_race_median_salaried)
```

[329]:
```
                                                    count_nonzero   median
race_ethnicity
White (United States of America)                            99.00 88000.00
Black or African American (United States of Ame...          14.00 84640.00
Asian (United States of America)                            13.00 80000.00
Hispanic or Latino (United States of America)                5.00 80000.00
```

[330]:
```
current_commercial_race_median_hourly = commercial_hourly.
 ↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_commercial_race_median_hourly)
```

[330]:
```
                                                    count_nonzero  median
race_ethnicity
White (United States of America)                            43.00   30.38
Asian (United States of America)                             7.00   26.04
Black or African American (United States of Ame...          82.00   24.91
Hispanic or Latino (United States of America)                9.00   23.12
```

[331]:
```
current_commercial_race_group_median_salaried = commercial_salaried.
 ↪groupby(['race_grouping']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_commercial_race_group_median_salaried)
```

[331]:
```
                  count_nonzero   median
race_grouping
white                     99.00 88000.00
person of color           32.00 83444.64
```

[332]:
```
current_commercial_race_group_median_hourly = commercial_hourly.
 ↪groupby(['race_grouping']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_commercial_race_group_median_hourly)
```

[332]:
```
                  count_nonzero  median
race_grouping
white                     43.00   30.38
person of color          101.00   25.16
```

[333]:
```
current_commercial_race_age_salaried = commercial_salaried.
 ↪groupby(['race_ethnicity'])['age'].median().sort_values(ascending=False)
current_commercial_race_age_salaried
```

[333]:
```
race_ethnicity
Black or African American (United States of America)   48.00
Hispanic or Latino (United States of America)          41.00
Prefer Not to Disclose (United States of America)      35.50
White (United States of America)                       35.00
Asian (United States of America)                       32.00
Name: age, dtype: float64
```

[334]:
```
current_commercial_race_age_hourly = commercial_hourly.
↪groupby(['race_ethnicity'])['age'].median().sort_values(ascending=False)
current_commercial_race_age_hourly
```

[334]:
```
race_ethnicity
Black or African American (United States of America)          48.50
White (United States of America)                              39.00
American Indian or Alaska Native (United States of America)   38.00
Prefer Not to Disclose (United States of America)             35.00
Two or More Races (United States of America)                  31.00
Hispanic or Latino (United States of America)                 30.00
Asian (United States of America)                              28.00
Name: age, dtype: float64
```

[335]:
```
current_commercial_race_age_5_salary = commercial_salaried.
↪groupby(['age_group_5','race_ethnicity']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_commercial_race_age_5_salary)
```

[335]:
```
                                                count_nonzero    median
age_group_5 race_ethnicity
<25         White (United States of America)             9.00  63000.00
25-29       White (United States of America)            28.00  78691.50
30-34       White (United States of America)            12.00  98847.80
35-39       White (United States of America)            13.00 149101.00
40-44       White (United States of America)             6.00 126864.75
45-49       White (United States of America)             7.00  90000.00
50-54       White (United States of America)             9.00  87391.89
55-59       White (United States of America)             8.00  96957.39
60-64       White (United States of America)             6.00  97651.02
```

[336]:
```
current_commercial_race_age_5_hourly = commercial_hourly.
↪groupby(['age_group_5','race_ethnicity']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_commercial_race_age_5_hourly)
```

[336]:
```
                                                                  count_nonzero  \
age_group_5 race_ethnicity
<25         Black or African American (United States of Ame...            5.00
25-29       White (United States of America)                             11.00
35-39       White (United States of America)                              6.00
40-44       Black or African American (United States of Ame...           13.00
```

```
45-49        Black or African American (United States of Ame...          14.00
50-54        Black or African American (United States of Ame...          12.00
             White (United States of America)                             5.00
55-59        Black or African American (United States of Ame...          11.00
             White (United States of America)                             5.00
60-64        Black or African American (United States of Ame...          11.00
65+          Black or African American (United States of Ame...           5.00

                                                                 median
age_group_5 race_ethnicity
<25          Black or African American (United States of Ame...   22.36
25-29        White (United States of America)                      31.84
35-39        White (United States of America)                      30.81
40-44        Black or African American (United States of Ame...   28.89
45-49        Black or African American (United States of Ame...   23.11
50-54        Black or African American (United States of Ame...   23.27
             White (United States of America)                      24.44
55-59        Black or African American (United States of Ame...   27.05
             White (United States of America)                      25.36
60-64        Black or African American (United States of Ame...   24.27
65+          Black or African American (United States of Ame...   23.39
```

[337]:

```
current_commercial_race_age_10_salary = commercial_salaried.
 ↪groupby(['age_group_10','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_age_10_salary)
```

[337]:

```
                                              count_nonzero    median
age_group_10 race_ethnicity
<25          White (United States of America)          9.00  63000.00
25-34        Asian (United States of America)          6.00  82418.32
             White (United States of America)         40.00  82000.00
35-44        White (United States of America)         19.00 148729.50
45-54        White (United States of America)         16.00  88695.95
55-64        White (United States of America)         14.00  97324.60
```

[338]:

```
current_commercial_race_age_10_hourly = commercial_hourly.
 ↪groupby(['age_group_10','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_age_10_hourly)
```

[338]:

```
                                                                 count_nonzero
\
age_group_10 race_ethnicity
<25          Black or African American (United States of Ame...           5.00
25-34        Black or African American (United States of Ame...           7.00
             Hispanic or Latino (United States of America)                6.00
             White (United States of America)                            12.00
35-44        Black or African American (United States of Ame...          17.00
```

```
              White (United States of America)                          8.00
45-54         Black or African American (United States of Ame...      26.00
              White (United States of America)                          8.00
55-64         Black or African American (United States of Ame...      22.00
              White (United States of America)                          7.00
65+           Black or African American (United States of Ame...        5.00

                                                                 median
age_group_10 race_ethnicity
<25           Black or African American (United States of Ame...   22.36
25-34         Black or African American (United States of Ame...   26.73
              Hispanic or Latino (United States of America)        24.99
              White (United States of America)                     31.76
35-44         Black or African American (United States of Ame...   29.23
              White (United States of America)                     30.57
45-54         Black or African American (United States of Ame...   23.27
              White (United States of America)                     30.81
55-64         Black or African American (United States of Ame...   24.54
              White (United States of America)                     26.41
65+           Black or African American (United States of Ame...   23.39
```

[339]:
```
current_commercial_race_group_age_5_salary = commercial_salaried.
 ↪groupby(['age_group_5','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_group_age_5_salary)
```

[339]:
```
                            count_nonzero     median
age_group_5 race_grouping
<25         white                    9.00   63000.00
25-29       person of color          7.00   72000.00
            white                   28.00   78691.50
30-34       white                   12.00   98847.80
35-39       person of color          5.00   73521.60
            white                   13.00  149101.00
40-44       white                    6.00  126864.75
45-49       person of color          6.00   85449.96
            white                    7.00   90000.00
50-54       white                    9.00   87391.89
55-59       white                    8.00   96957.39
60-64       white                    6.00   97651.02
```

[340]:
```
current_commercial_race_group_age_5_hourly = commercial_hourly.
 ↪groupby(['age_group_5','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_group_age_5_hourly)
```

[340]:
```
                            count_nonzero  median
age_group_5 race_grouping
<25         person of color          7.00   25.64
```

```
25-29         person of color          10.00   26.29
              white                    11.00   31.84
30-34         person of color           8.00   28.82
35-39         person of color           6.00   30.81
              white                     6.00   30.81
40-44         person of color          14.00   28.52
45-49         person of color          14.00   23.11
50-54         person of color          13.00   23.19
              white                     5.00   24.44
55-59         person of color          11.00   27.05
              white                     5.00   25.36
60-64         person of color          11.00   24.27
65+           person of color           7.00   23.40
```

[341]:
```
current_commercial_race_group_age_10_salary = commercial_salaried.
 ↪groupby(['age_group_10','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_group_age_10_salary)
```

[341]:
```
                              count_nonzero    median
age_group_10 race_grouping
<25          white                     9.00  63000.00
25-34        person of color          10.00  74918.32
             white                    40.00  82000.00
35-44        person of color           7.00  90431.45
             white                    19.00 148729.50
45-54        person of color           7.00  85000.00
             white                    16.00  88695.95
55-64        person of color           6.00  82708.86
             white                    14.00  97324.60
```

[342]:
```
current_commercial_race_group_age_10_hourly = commercial_hourly.
 ↪groupby(['age_group_10','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_group_age_10_hourly)
```

[342]:
```
                              count_nonzero  median
age_group_10 race_grouping
<25          person of color           7.00   25.64
25-34        person of color          18.00   26.52
             white                    12.00   31.76
35-44        person of color          20.00   29.06
             white                     8.00   30.57
45-54        person of color          27.00   23.19
             white                     8.00   30.81
55-64        person of color          22.00   24.54
             white                     7.00   26.41
65+          person of color           7.00   23.40
```

[343]:
```
current_commercial_race_under_40_salaried =␣
 ↪commercial_salaried[commercial_salaried['age'] < 40].
 ↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_commercial_race_under_40_salaried)
```

[343]:
```
                                         count_nonzero   median
race_ethnicity
White (United States of America)                 62.00 82000.00
Asian (United States of America)                 10.00 77418.32
```

[344]:
```
current_commercial_race_over_40_salaried =␣
 ↪commercial_salaried[commercial_salaried['age'] > 39].
 ↪groupby(['race_ethnicity']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_commercial_race_over_40_salaried)
```

[344]:
```
                                                          count_nonzero   median
race_ethnicity
White (United States of America)                                  37.00 97134.77
Black or African American (United States of Ame...                10.00 84848.86
```

[345]:
```
current_commercial_race_under_40_hourly =␣
 ↪commercial_hourly[commercial_hourly['age'] < 40].groupby(['race_ethnicity']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_race_under_40_hourly)
```

[345]:
```
                                                          count_nonzero  median
race_ethnicity
White (United States of America)                                  22.00   31.46
Black or African American (United States of Ame...                16.00   26.50
Hispanic or Latino (United States of America)                      8.00   25.62
```

[346]:
```
current_commercial_race_over_40_hourly =␣
 ↪commercial_hourly[commercial_hourly['age'] > 39].groupby(['race_ethnicity']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_race_over_40_hourly)
```

[346]:
```
                                                          count_nonzero  median
race_ethnicity
White (United States of America)                                  21.00   29.23
Black or African American (United States of Ame...                66.00   24.35
```

1.6.3 Gender x race/ethnicity

[347]:
```
current_commercial_race_gender_salaried = commercial_salaried.
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero]})
suppress(current_commercial_race_gender_salaried)
```

[347]:

```
                                                        count_nonzero
race_ethnicity                                   gender
Asian (United States of America)                 Female          8.00
                                                 Male            5.00
Black or African American (United States of Ame... Female        7.00
                                                 Male            7.00
White (United States of America)                 Female         67.00
                                                 Male           32.00
```

[348]:

```
current_commercial_race_gender_hourly = commercial_hourly.
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero]})
suppress(current_commercial_race_gender_hourly)
```

[348]:

```
                                                        count_nonzero
race_ethnicity                                   gender
Black or African American (United States of Ame... Female       41.00
                                                 Male           41.00
Hispanic or Latino (United States of America)    Female          6.00
White (United States of America)                 Female         22.00
                                                 Male           21.00
```

[349]:

```
current_commercial_race_gender_median_salaried = commercial_salaried.
 ↪groupby(['race_grouping','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_gender_median_salaried)
```

[349]:

```
                        count_nonzero   median
race_grouping   gender
person of color Female          17.00 85000.00
                Male            15.00 76866.10
white           Female          67.00 86104.69
                Male            32.00 94496.71
```

[350]:

```
current_commercial_race_gender_median_hourly = commercial_hourly.
 ↪groupby(['race_grouping','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_gender_median_hourly)
```

[350]:

```
                        count_nonzero  median
race_grouping   gender
person of color Female          52.00   26.54
                Male            49.00   23.33
white           Female          22.00   31.76
                Male            21.00   26.76
```

[351]:

```
current_commercial_race_gender_under_40_salaried =␣
 ↪commercial_salaried[commercial_salaried['age'] < 40].
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
```

```
suppress(current_commercial_race_gender_under_40_salaried)
```

[351]:

```
                                          count_nonzero   median
race_ethnicity                    gender
Asian (United States of America) Female           6.00 85000.00
White (United States of America) Female          46.00 80212.00
                                 Male            16.00 90940.00
```

[352]:

```
current_commercial_race_gender_under_40_hourly =␣
 ↪commercial_hourly[commercial_hourly['age'] < 40].
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_gender_under_40_hourly)
```

[352]:

```
                                                            count_nonzero  \
race_ethnicity                                      gender
Black or African American (United States of Ame... Female           8.00
                                                    Male             8.00
Hispanic or Latino (United States of America)      Female           6.00
White (United States of America)                    Female          12.00
                                                    Male            10.00


                                                            median
race_ethnicity                                      gender
Black or African American (United States of Ame... Female   26.50
                                                    Male     26.31
Hispanic or Latino (United States of America)      Female   28.51
White (United States of America)                    Female   33.28
                                                    Male     30.57
```

[353]:

```
current_commercial_race_gender_over_40_salaried =␣
 ↪commercial_salaried[commercial_salaried['age'] > 39].
 ↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_race_gender_over_40_salaried)
```

[353]:

```
                                                            count_nonzero  \
race_ethnicity                                      gender
Black or African American (United States of Ame... Female           6.00
White (United States of America)                    Female          21.00
                                                    Male            16.00


                                                             median
race_ethnicity                                      gender
Black or African American (United States of Ame... Female 94950.50
White (United States of America)                    Female 97546.00
                                                    Male   95564.10
```

[354]:

```
current_commercial_race_gender_over_40_hourly =␣
↪commercial_hourly[commercial_hourly['age'] > 39].
↪groupby(['race_ethnicity','gender']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_commercial_race_gender_over_40_hourly)
```

[354]:

```
                                                                count_nonzero  \
race_ethnicity                                           gender
Black or African American (United States of Ame...   Female            33.00
                                                      Male              33.00
White (United States of America)                      Female            10.00
                                                      Male              11.00


                                                                median
race_ethnicity                                           gender
Black or African American (United States of Ame...   Female     26.14
                                                      Male       23.07
White (United States of America)                      Female     31.02
                                                      Male       23.85
```

1.6.4 Years of service

[355]:

```
current_commercial_yos_salary = commercial_salaried.
↪groupby(['years_of_service_grouped']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_commercial_yos_salary)
```

[355]:

```
                          count_nonzero   median
years_of_service_grouped
0                                 31.00 82000.00
1-2                               36.00 80212.00
3-5                               26.00 95769.71
6-10                              15.00 99316.00
11-15                              6.00 76331.03
16-20                              6.00 81765.65
21-25                              8.00 94006.52
25+                                5.00 93490.62
```

[356]:

```
current_commercial_yos_hourly = commercial_hourly.
↪groupby(['years_of_service_grouped']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress(current_commercial_yos_hourly)
```

[356]:

```
                          count_nonzero  median
years_of_service_grouped
0                                 26.00   25.64
1-2                               33.00   26.99
3-5                               14.00   23.16
```

```
6-10                             19.00   23.98
11-15                            14.00   30.15
16-20                            17.00   24.32
21-25                             9.00   29.74
25+                              15.00   26.34
```

[357]:
```
current_commercial_yos_gender_salary = commercial_salaried.
 ↪groupby(['years_of_service_grouped','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_yos_gender_salary)
```

[357]:
```
                                 count_nonzero    median
years_of_service_grouped gender
0                        Female          22.00  74640.00
                         Male             9.00  90000.00
1-2                      Female          26.00  80212.00
                         Male            10.00  81640.00
3-5                      Female          16.00  94107.74
                         Male            10.00 102496.71
6-10                     Female          12.00  99499.70
21-25                    Male             6.00  91466.08
```

[358]:
```
current_commercial_yos_gender_hourly = commercial_hourly.
 ↪groupby(['years_of_service_grouped','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_commercial_yos_gender_hourly)
```

[358]:
```
                                 count_nonzero  median
years_of_service_grouped gender
0                        Female          10.00   29.48
                         Male            16.00   22.05
1-2                      Female          18.00   30.29
                         Male            15.00   24.35
3-5                      Female           5.00   30.77
                         Male             9.00   22.14
6-10                     Female           5.00   26.27
                         Male            14.00   23.62
11-15                    Male            10.00   29.04
16-20                    Female          10.00   24.16
                         Male             7.00   27.26
21-25                    Female           8.00   27.94
25+                      Female          14.00   26.58
```

[359]:
```
current_commercial_yos_race_salary = commercial_salaried.
 ↪groupby(['years_of_service_grouped','race_ethnicity']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_yos_race_salary)
```

[359]:
```
                                                         count_nonzero  \
years_of_service_grouped race_ethnicity
```

```
0                         White (United States of America)          23.00
1-2                       White (United States of America)          30.00
3-5                       White (United States of America)          19.00
6-10                      White (United States of America)          11.00
16-20                     White (United States of America)           5.00
21-25                     White (United States of America)           6.00

                                                               median
years_of_service_grouped race_ethnicity
0                         White (United States of America)  82000.00
1-2                       White (United States of America)  80212.00
3-5                       White (United States of America) 108780.00
6-10                      White (United States of America) 102500.00
16-20                     White (United States of America)  87391.89
21-25                     White (United States of America)  97651.02
```

[360]:
```
current_commercial_yos_race_hourly = commercial_hourly.
 ↪groupby(['years_of_service_grouped','race_ethnicity']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_yos_race_hourly)
```

[360]:
```
count_nonzero  \
years_of_service_grouped race_ethnicity
0                         Black or African American (United States of Ame...
11.00
                          White (United States of America)
6.00
1-2                       Black or African American (United States of Ame...
14.00
                          White (United States of America)
13.00
3-5                       Black or African American (United States of Ame...
6.00
                          White (United States of America)
5.00
6-10                      Black or African American (United States of Ame...
12.00
                          White (United States of America)
6.00
11-15                     Black or African American (United States of Ame...
7.00
                          White (United States of America)
6.00
16-20                     Black or African American (United States of Ame...
12.00
21-25                     Black or African American (United States of Ame...
9.00
25+                       Black or African American (United States of Ame...
```

```
11.00

median
years_of_service_grouped race_ethnicity
0                        Black or African American (United States of Ame...
25.64
                         White (United States of America)
29.52
1-2                      Black or African American (United States of Ame...
23.56
                         White (United States of America)
34.72
3-5                      Black or African American (United States of Ame...
21.83
                         White (United States of America)
23.20
6-10                     Black or African American (United States of Ame...
23.62
                         White (United States of America)
29.91
11-15                    Black or African American (United States of Ame...
30.38
                         White (United States of America)
26.01
16-20                    Black or African American (United States of Ame...
24.13
21-25                    Black or African American (United States of Ame...
29.74
25+                      Black or African American (United States of Ame...
24.71
```

[361]:
```python
current_commercial_yos_race_gender_salary = commercial_salaried.
 ↪groupby(['years_of_service_grouped','race_grouping','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_yos_race_gender_salary)
```

[361]:
```
                                                     count_nonzero    median
years_of_service_grouped race_grouping   gender
0                        person of color Female               6.00  78500.00
                         white           Female              15.00  74280.00
                                         Male                 8.00  92500.00
1-2                      person of color Female               5.00  96980.00
                         white           Female              21.00  77383.00
                                         Male                 9.00  83280.00
3-5                      person of color Male                 5.00  74836.65
                         white           Female              14.00  94107.74
                                         Male                 5.00 125530.00
6-10                     white           Female              10.00 101091.70
```

[362]:
```
current_commercial_yos_race_gender_hourly = commercial_hourly.
 ↪groupby(['years_of_service_grouped','race_grouping','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_commercial_yos_race_gender_hourly)
```

[362]:
```
                                                 count_nonzero  median
years_of_service_grouped race_grouping   gender
0                        person of color Female           7.00   29.74
                                         Male            10.00   21.35
1-2                      person of color Female           9.00   26.73
                                         Male            11.00   22.36
                         white           Female           9.00   35.01
3-5                      person of color Male             6.00   21.83
6-10                     person of color Male            10.00   23.42
11-15                    person of color Male             5.00   29.92
                         white           Male             5.00   26.76
16-20                    person of color Female           9.00   23.99
                                         Male             5.00   24.27
21-25                    person of color Female           8.00   27.94
25+                      person of color Female          10.00   25.52
```

1.6.5 Age

[363]:
```
current_median_commercial_age_5_salaried = commercial_salaried.
 ↪groupby(['age_group_5']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress(current_median_commercial_age_5_salaried)
```

[363]:
```
             count_nonzero    median
age_group_5
<25                  10.00  64000.00
25-29                35.00  75000.00
30-34                16.00  98847.80
35-39                18.00 101091.70
40-44                 9.00 143575.94
45-49                13.00  86104.69
50-54                10.00  87002.45
55-59                10.00  96957.39
60-64                10.00  95753.93
```

[364]:
```
current_median_commercial_age_5_hourly = commercial_hourly.
 ↪groupby(['age_group_5']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress(current_median_commercial_age_5_hourly)
```

[364]:
```
             count_nonzero  median
age_group_5
<25                  11.00   25.64
```

```
25-29                   22.00   29.77
30-34                    9.00   29.51
35-39                   13.00   30.77
40-44                   17.00   28.89
45-49                   17.00   23.99
50-54                   18.00   23.60
55-59                   16.00   26.23
60-64                   13.00   24.32
65+                     11.00   23.40
```

[365]:
```
current_median_commercial_age_10_salaried = commercial_salaried.
 ↪groupby(['age_group_10']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress(current_median_commercial_age_10_salaried)
```

[365]:
```
              count_nonzero    median
age_group_10
<25                   10.00  64000.00
25-34                 51.00  82000.00
35-44                 27.00 105000.00
45-54                 23.00  86613.00
55-64                 20.00  96957.39
```

[366]:
```
current_median_commercial_age_10_hourly = commercial_hourly.
 ↪groupby(['age_group_10']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress(current_median_commercial_age_10_hourly)
```

[366]:
```
              count_nonzero  median
age_group_10
<25                   11.00   25.64
25-34                 31.00   29.51
35-44                 30.00   29.23
45-54                 35.00   23.85
55-64                 29.00   24.71
65+                   11.00   23.40
```

[367]:
```
current_commercial_age_5_yos_salary = commercial_salaried.
 ↪groupby(['age_group_5','years_of_service_grouped']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_commercial_age_5_yos_salary)
```

[367]:
```
                                        count_nonzero    median
age_group_5 years_of_service_grouped
<25         0                                    6.00  62500.00
25-29       0                                   14.00  75000.00
            1-2                                 17.00  76000.00
30-34       0                                    6.00 100000.00
            1-2                                  7.00  96980.00
35-39       3-5                                  7.00 149101.00
```

```
              6-10                           6.00 101091.70
40-44         3-5                            5.00 167000.00
60-64         21-25                          5.00  97514.43
```

[368]:
```
current_commercial_age_5_yos_hourly = commercial_hourly.
 ↪groupby(['age_group_5','years_of_service_grouped']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_commercial_age_5_yos_hourly)
```

[368]:
```
                                       count_nonzero  median
age_group_5 years_of_service_grouped
<25         0                                   5.00   23.08
            1-2                                 6.00   27.94
25-29       0                                   6.00   33.34
            1-2                                15.00   26.73
30-34       0                                   5.00   22.05
35-39       11-15                               5.00   30.38
40-44       3-5                                 5.00   29.23
55-59       25+                                 6.00   27.94
60-64       16-20                               5.00   24.27
65+         25+                                 5.00   26.82
```

[369]:
```
current_commercial_age_10_yos_salary = commercial_salaried.
 ↪groupby(['age_group_10','years_of_service_grouped']).agg({'current_base_pay':
 ↪ [np.count_nonzero, np.median]})
suppress(current_commercial_age_10_yos_salary)
```

[369]:
```
                                        count_nonzero    median
age_group_10 years_of_service_grouped
<25          0                                   6.00  62500.00
25-34        0                                  20.00  82000.00
             1-2                                24.00  80810.05
             3-5                                 5.00  85850.00
35-44        3-5                                12.00 158050.50
             6-10                                6.00 101091.70
45-54        3-5                                 5.00  86613.00
55-64        21-25                               5.00  97514.43
```

[370]:
```
current_commercial_age_10_yos_hourly = commercial_hourly.
 ↪groupby(['age_group_10','years_of_service_grouped']).agg({'current_base_pay':
 ↪ [np.count_nonzero, np.median]})
suppress(current_commercial_age_10_yos_hourly)
```

[370]:
```
                                        count_nonzero  median
age_group_10 years_of_service_grouped
<25          0                                   5.00   23.08
             1-2                                 6.00   27.94
25-34        0                                  11.00   30.26
             1-2                                15.00   26.73
35-44        0                                   5.00   29.23
```

```
              3-5                                  6.00   26.18
              11-15                                7.00   30.38
45-54         0                                    5.00   20.50
              1-2                                  5.00   22.36
              6-10                                 7.00   23.85
              16-20                                6.00   28.27
55-64         6-10                                 6.00   23.39
              16-20                                6.00   24.30
              25+                                  8.00   27.94
65+           25+                                  5.00   26.82
```

[371]:
```
current_median_commercial_age_5_gender_salaried = commercial_salaried.
 ↪groupby(['age_group_5','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_5_gender_salaried)
```

[371]:
```
                    count_nonzero    median
age_group_5 gender
<25         Female           8.00  63500.00
25-29       Female          29.00  75000.00
            Male             6.00  79140.00
30-34       Female           9.00 100000.00
            Male             7.00  97695.60
35-39       Female           9.00 149101.00
            Male             9.00  77626.78
40-44       Female           8.00 124287.97
45-49       Female           7.00  90585.00
            Male             6.00  85089.96
50-54       Female           7.00  90669.48
55-59       Female           5.00  96780.00
            Male             5.00  97134.77
60-64       Male             6.00  95753.93
```

[372]:
```
current_median_commercial_age_5_gender_hourly = commercial_hourly.
 ↪groupby(['age_group_5','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_5_gender_hourly)
```

[372]:
```
                    count_nonzero  median
age_group_5 gender
<25         Male             7.00   23.08
25-29       Female          14.00   31.76
            Male             8.00   26.17
30-34       Female           6.00   30.32
35-39       Female           5.00   30.77
            Male             8.00   30.62
40-44       Female          12.00   29.48
            Male             5.00   21.50
45-49       Female           7.00   31.28
```

```
             Male           10.00   22.39
50-54        Female          6.00   23.27
             Male           12.00   24.15
55-59        Female          9.00   26.41
             Male            7.00   23.45
60-64        Female          6.00   24.51
             Male            7.00   24.27
65+          Female          5.00   27.69
             Male            6.00   22.73
```

[373]:
```
current_median_commercial_age_10_gender_salaried = commercial_salaried.
 ↪groupby(['age_group_10','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_10_gender_salaried)
```

[373]:
```
                     count_nonzero    median
age_group_10 gender
<25          Female           8.00  63500.00
25-34        Female          38.00  80212.00
             Male            13.00  86880.00
35-44        Female          17.00 143575.94
             Male            10.00  84029.11
45-54        Female          14.00  90627.24
             Male             9.00  85000.00
55-64        Female           9.00  96780.00
             Male            11.00  97134.77
```

[374]:
```
current_median_commercial_age_10_gender_hourly = commercial_hourly.
 ↪groupby(['age_group_10','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_10_gender_hourly)
```

[374]:
```
                     count_nonzero  median
age_group_10 gender
<25          Male             7.00   23.08
25-34        Female          20.00   31.03
             Male            11.00   26.04
35-44        Female          17.00   29.74
             Male            13.00   27.18
45-54        Female          13.00   26.14
             Male            22.00   23.49
55-64        Female          15.00   25.36
             Male            14.00   23.86
65+          Female           5.00   27.69
             Male             6.00   22.73
```

[375]:
```
current_median_commercial_age_5_race_salaried = commercial_salaried.
 ↪groupby(['age_group_5','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
```

```
suppress(current_median_commercial_age_5_race_salaried)
```

[375]:

```
                                               count_nonzero    median
age_group_5 race_ethnicity
<25         White (United States of America)            9.00  63000.00
25-29       White (United States of America)           28.00  78691.50
30-34       White (United States of America)           12.00  98847.80
35-39       White (United States of America)           13.00 149101.00
40-44       White (United States of America)            6.00 126864.75
45-49       White (United States of America)            7.00  90000.00
50-54       White (United States of America)            9.00  87391.89
55-59       White (United States of America)            8.00  96957.39
60-64       White (United States of America)            6.00  97651.02
```

[376]:

```
current_median_commercial_age_5_race_hourly = commercial_hourly.
 ↪groupby(['age_group_5','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_5_race_hourly)
```

[376]:

```
                                                                   count_nonzero  \
age_group_5 race_ethnicity
<25         Black or African American (United States of Ame...           5.00
25-29       White (United States of America)                             11.00
35-39       White (United States of America)                              6.00
40-44       Black or African American (United States of Ame...          13.00
45-49       Black or African American (United States of Ame...          14.00
50-54       Black or African American (United States of Ame...          12.00
            White (United States of America)                              5.00
55-59       Black or African American (United States of Ame...          11.00
            White (United States of America)                              5.00
60-64       Black or African American (United States of Ame...          11.00
65+         Black or African American (United States of Ame...           5.00


                                                                   median
age_group_5 race_ethnicity
<25         Black or African American (United States of Ame...   22.36
25-29       White (United States of America)                     31.84
35-39       White (United States of America)                     30.81
40-44       Black or African American (United States of Ame...   28.89
45-49       Black or African American (United States of Ame...   23.11
50-54       Black or African American (United States of Ame...   23.27
            White (United States of America)                     24.44
55-59       Black or African American (United States of Ame...   27.05
            White (United States of America)                     25.36
60-64       Black or African American (United States of Ame...   24.27
65+         Black or African American (United States of Ame...   23.39
```

[377]:

```
current_median_commercial_age_5_race_group_salaried = commercial_salaried.
 ↪groupby(['age_group_5','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_5_race_group_salaried)
```

[377]:

```
                           count_nonzero    median
age_group_5 race_grouping
<25         white                   9.00  63000.00
25-29       person of color         7.00  72000.00
            white                  28.00  78691.50
30-34       white                  12.00  98847.80
35-39       person of color         5.00  73521.60
            white                  13.00 149101.00
40-44       white                   6.00 126864.75
45-49       person of color         6.00  85449.96
            white                   7.00  90000.00
50-54       white                   9.00  87391.89
55-59       white                   8.00  96957.39
60-64       white                   6.00  97651.02
```

[378]:

```
current_median_commercial_age_5_race_group_hourly = commercial_hourly.
 ↪groupby(['age_group_5','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_5_race_group_hourly)
```

[378]:

```
                           count_nonzero  median
age_group_5 race_grouping
<25         person of color         7.00   25.64
25-29       person of color        10.00   26.29
            white                  11.00   31.84
30-34       person of color         8.00   28.82
35-39       person of color         6.00   30.81
            white                   6.00   30.81
40-44       person of color        14.00   28.52
45-49       person of color        14.00   23.11
50-54       person of color        13.00   23.19
            white                   5.00   24.44
55-59       person of color        11.00   27.05
            white                   5.00   25.36
60-64       person of color        11.00   24.27
65+         person of color         7.00   23.40
```

[379]:

```
current_median_commercial_age_10_race_salaried = commercial_salaried.
 ↪groupby(['age_group_10','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_10_race_salaried)
```

[379]:

```
                                                  count_nonzero    median
age_group_10 race_ethnicity
```

```
<25           White (United States of America)           9.00  63000.00
25-34         Asian (United States of America)           6.00  82418.32
              White (United States of America)          40.00  82000.00
35-44         White (United States of America)          19.00 148729.50
45-54         White (United States of America)          16.00  88695.95
55-64         White (United States of America)          14.00  97324.60
```

[380]:
```
current_median_commercial_age_10_race_hourly = commercial_hourly.
 ↪groupby(['age_group_10','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_10_race_hourly)
```

[380]:
```
                                                                 count_nonzero
\
age_group_10 race_ethnicity
<25          Black or African American (United States of Ame...           5.00
25-34        Black or African American (United States of Ame...           7.00
             Hispanic or Latino (United States of America)                6.00
             White (United States of America)                            12.00
35-44        Black or African American (United States of Ame...          17.00
             White (United States of America)                             8.00
45-54        Black or African American (United States of Ame...          26.00
             White (United States of America)                             8.00
55-64        Black or African American (United States of Ame...          22.00
             White (United States of America)                             7.00
65+          Black or African American (United States of Ame...           5.00

                                                                 median
age_group_10 race_ethnicity
<25          Black or African American (United States of Ame...   22.36
25-34        Black or African American (United States of Ame...   26.73
             Hispanic or Latino (United States of America)        24.99
             White (United States of America)                     31.76
35-44        Black or African American (United States of Ame...   29.23
             White (United States of America)                     30.57
45-54        Black or African American (United States of Ame...   23.27
             White (United States of America)                     30.81
55-64        Black or African American (United States of Ame...   24.54
             White (United States of America)                     26.41
65+          Black or African American (United States of Ame...   23.39
```

[381]:
```
current_median_commercial_age_10_race_group_salaried = commercial_salaried.
 ↪groupby(['age_group_10','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_10_race_group_salaried)
```

[381]:
```
                              count_nonzero    median
age_group_10 race_grouping
<25          white                     9.00  63000.00
```

```
25-34        person of color          10.00  74918.32
             white                    40.00  82000.00
35-44        person of color           7.00  90431.45
             white                    19.00 148729.50
45-54        person of color           7.00  85000.00
             white                    16.00  88695.95
55-64        person of color           6.00  82708.86
             white                    14.00  97324.60
```

[382]:
```
current_median_commercial_age_10_race_group_hourly = commercial_hourly.
 ↪groupby(['age_group_10','race_grouping']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress(current_median_commercial_age_10_race_group_hourly)
```

[382]:
```
                            count_nonzero  median
age_group_10 race_grouping
<25          person of color          7.00   25.64
25-34        person of color         18.00   26.52
             white                   12.00   31.76
35-44        person of color         20.00   29.06
             white                    8.00   30.57
45-54        person of color         27.00   23.19
             white                    8.00   30.81
55-64        person of color         22.00   24.54
             white                    7.00   26.41
65+          person of color          7.00   23.40
```

[383]:
```
current_median_commercial_age_5_race_gender_salaried = commercial_salaried.
 ↪groupby(['age_group_5','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_commercial_age_5_race_gender_salaried)
```

[383]:
```
                                                 count_nonzero    median
age_group_5 race_ethnicity                 gender
<25         White (United States of America) Female          7.00  62000.00
25-29       White (United States of America) Female         25.00  76000.00
30-34       White (United States of America) Female          5.00 131097.12
                                             Male            7.00  97695.60
35-39       White (United States of America) Female          9.00 149101.00
40-44       White (United States of America) Female          6.00 126864.75
50-54       White (United States of America) Female          6.00  98281.24
55-59       White (United States of America) Male            5.00  97134.77
```

[384]:
```
current_median_commercial_age_5_race_gender_hourly = commercial_hourly.
 ↪groupby(['age_group_5','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_commercial_age_5_race_gender_hourly)
```

[384]:
```
count_nonzero  \
age_group_5 race_ethnicity                                        gender
```

```
<25          Black or African American (United States of Ame... Male
5.00
25-29        White (United States of America)                   Female
7.00
40-44        Black or African American (United States of Ame... Female
9.00
45-49        Black or African American (United States of Ame... Male
10.00
50-54        Black or African American (United States of Ame... Female
6.00
                                                                Male
6.00
             White (United States of America)                   Male
5.00
55-59        Black or African American (United States of Ame... Female
7.00
60-64        Black or African American (United States of Ame... Female
5.00
                                                                Male
6.00

                                                                        median
age_group_5 race_ethnicity                                      gender
<25          Black or African American (United States of Ame... Male     22.36
25-29        White (United States of America)                   Female   35.01
40-44        Black or African American (United States of Ame... Female   29.74
45-49        Black or African American (United States of Ame... Male     22.39
50-54        Black or African American (United States of Ame... Female   23.27
                                                                Male     23.01
             White (United States of America)                   Male     24.44
55-59        Black or African American (United States of Ame... Female   28.61
60-64        Black or African American (United States of Ame... Female   24.32
                                                                Male     23.80
```

[385]:

```
current_median_commercial_age_5_race_group_gender_salaried =␣
↪commercial_salaried.groupby(['age_group_5','race_grouping','gender']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_median_commercial_age_5_race_group_gender_salaried)
```

[385]:

```
                                       count_nonzero    median
age_group_5 race_grouping   gender
<25         white           Female              7.00  62000.00
25-29       white           Female             25.00  76000.00
30-34       white           Female              5.00 131097.12
                            Male                7.00  97695.60
35-39       person of color Male                5.00  73521.60
            white           Female              9.00 149101.00
40-44       white           Female              6.00 126864.75
```

```
50-54        white           Female          6.00  98281.24
55-59        white           Male            5.00  97134.77
```

[386]:
```
current_median_commercial_age_5_race_group_gender_hourly = commercial_hourly.
 ↪groupby(['age_group_5','race_grouping','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_commercial_age_5_race_group_gender_hourly)
```

[386]:
```
                                    count_nonzero  median
age_group_5 race_grouping   gender
<25         person of color Male             5.00   22.36
25-29       person of color Female           7.00   26.27
            white           Female           7.00   35.01
30-34       person of color Female           5.00   30.38
40-44       person of color Female          10.00   29.48
45-49       person of color Male            10.00   22.39
50-54       person of color Female           6.00   23.27
                            Male             7.00   21.10
            white           Male             5.00   24.44
55-59       person of color Female           7.00   28.61
60-64       person of color Female           5.00   24.32
                            Male             6.00   23.80
```

[387]:
```
current_median_commercial_age_10_race_gender_salaried = commercial_salaried.
 ↪groupby(['age_group_10','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_commercial_age_10_race_gender_salaried)
```

[387]:
```
                                                      count_nonzero    median
age_group_10 race_ethnicity                    gender
<25          White (United States of America) Female           7.00  62000.00
25-34        Asian (United States of America) Female           5.00  90000.00
             White (United States of America) Female          30.00  78691.50
                                               Male           10.00  96347.80
35-44        White (United States of America) Female          15.00 148729.50
45-54        White (United States of America) Female          10.00  98281.24
                                               Male            6.00  86195.95
55-64        White (United States of America) Female           5.00  96780.00
                                               Male            9.00  97514.43
```

[388]:
```
current_median_commercial_age_10_race_gender_hourly = commercial_hourly.
 ↪groupby(['age_group_10','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_commercial_age_10_race_gender_hourly)
```

[388]:
```
count_nonzero  \
age_group_10 race_ethnicity                                       gender
<25          Black or African American (United States of Ame... Male
5.00
25-34        Black or African American (United States of Ame... Female
```

```
6.00
                Hispanic or Latino (United States of America)      Female
5.00
                White (United States of America)                   Female
8.00
35-44           Black or African American (United States of Ame... Female
11.00
                                                                   Male
6.00
45-54           Black or African American (United States of Ame... Female
10.00
                                                                   Male
16.00
                White (United States of America)                   Male
5.00
55-64           Black or African American (United States of Ame... Female
12.00
                                                                   Male
10.00

                                                                           median
age_group_10 race_ethnicity                                        gender
<25          Black or African American (United States of Ame... Male       22.36
25-34        Black or African American (United States of Ame... Female     26.50
             Hispanic or Latino (United States of America)      Female     28.13
             White (United States of America)                   Female     33.42
35-44        Black or African American (United States of Ame... Female     29.74
                                                                Male       24.84
45-54        Black or African American (United States of Ame... Female     23.67
                                                                Male       22.39
             White (United States of America)                   Male       24.44
55-64        Black or African American (United States of Ame... Female     24.99
                                                                Male       23.86
```

[389]:
```
current_median_commercial_age_10_race_group_gender_salaried =␣
↪commercial_salaried.groupby(['age_group_10','race_grouping','gender']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress(current_median_commercial_age_10_race_group_gender_salaried)
```

[389]:
```
                                      count_nonzero    median
age_group_10 race_grouping   gender
<25          white           Female            7.00  62000.00
25-34        person of color Female            7.00  85000.00
             white           Female           30.00  78691.50
                             Male             10.00  96347.80
35-44        person of color Male              6.00  81976.52
             white           Female           15.00 148729.50
45-54        white           Female           10.00  98281.24
```

```
                              Male            6.00  86195.95
55-64       white             Female          5.00  96780.00
                              Male            9.00  97514.43
```

[390]:
```
current_median_commercial_age_10_race_group_gender_hourly = commercial_hourly.
 ↪groupby(['age_group_10','race_grouping','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress(current_median_commercial_age_10_race_group_gender_hourly)
```

[390]:
```
                                     count_nonzero  median
age_group_10 race_grouping   gender
<25          person of color Male             5.00   22.36
25-34        person of color Female          12.00   27.43
                             Male             6.00   26.17
             white           Female           8.00   33.42
35-44        person of color Female          13.00   29.74
                             Male             7.00   23.12
45-54        person of color Female          10.00   23.67
                             Male            17.00   22.34
             white           Male             5.00   24.44
55-64        person of color Female          12.00   24.99
                             Male            10.00   23.86
```

1.6.6 Departments

[391]:
```
current_commercial_median_department_salaried = commercial_salaried.
 ↪groupby(['department']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_commercial_median_department_salaried)
```

[391]:
```
                        count_nonzero   median
department
Finance                          8.00 90575.50
WP News Media Services           9.00 86104.69
Client Solutions               102.00 85633.86
Marketing                        7.00 81196.11
Production                       5.00 71665.06
```

[392]:
```
current_commercial_median_department_hourly = commercial_hourly.
 ↪groupby(['department']).agg({'current_base_pay': [np.count_nonzero, np.
 ↪median]})
suppress_median(current_commercial_median_department_hourly)
```

[392]:
```
                  count_nonzero  median
department
Public Relations           5.00   35.01
Client Solutions          62.00   29.41
Finance                   23.00   29.23
Circulation               49.00   22.44
```

[393]:
```
current_commercial_median_department_gender_salaried = commercial_salaried.
↪groupby(['department','gender']).agg({'current_base_pay': [np.count_nonzero,␣
↪np.median]})
suspress_median(current_commercial_median_department_gender_salaried)
```

[393]:
```
                                         count_nonzero    median
department              gender
Finance                 Female                    5.00 96780.00
Client Solutions        Male                     31.00 90000.00
WP News Media Services  Male                      5.00 85899.92
Client Solutions        Female                   71.00 85000.00
```

[394]:
```
current_commercial_median_department_gender_hourly = commercial_hourly.
↪groupby(['department','gender']).agg({'current_base_pay': [np.count_nonzero,␣
↪np.median]})
suppress_median(current_commercial_median_department_gender_hourly)
```

[394]:
```
                                 count_nonzero   median
department        gender
Public Relations  Female                  5.00    35.01
Client Solutions  Male                   24.00    30.13
Finance           Female                 17.00    29.23
                  Male                    6.00    28.85
Client Solutions  Female                 38.00    28.83
Circulation       Female                  9.00    23.19
                  Male                   40.00    22.40
```

[395]:
```
current_commercial_median_department_race_salaried = commercial_salaried.
↪groupby(['department','race_ethnicity']).agg({'current_base_pay': [np.
↪count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_salaried)
```

[395]:
```
count_nonzero   \
department              race_ethnicity
Client Solutions        White (United States of America)
79.00
WP News Media Services  White (United States of America)
8.00
Client Solutions        Black or African American (United States of Ame...
10.00
Marketing               White (United States of America)
5.00
Client Solutions        Asian (United States of America)
9.00

median
department              race_ethnicity
Client Solutions        White (United States of America)
90000.00
```

```
WP News Media Services White (United States of America)
88301.65
Client Solutions       Black or African American (United States of Ame...
83804.64
Marketing              White (United States of America)
83280.00
Client Solutions       Asian (United States of America)
76139.41
```

[396]:
```
current_commercial_median_department_race_hourly = commercial_hourly.
 ↪groupby(['department','race_ethnicity']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_hourly)
```

[396]:
```
count_nonzero  \
department       race_ethnicity
Client Solutions White (United States of America)
24.00
Finance          White (United States of America)
5.00
                 Black or African American (United States of Ame...
16.00
Client Solutions Hispanic or Latino (United States of America)
6.00
                 Black or African American (United States of Ame...
25.00
                 Asian (United States of America)
5.00
Circulation      White (United States of America)
8.00
                 Black or African American (United States of Ame...
35.00


                                                                      median
department       race_ethnicity
Client Solutions White (United States of America)                      31.00
Finance          White (United States of America)                      29.49
                 Black or African American (United States of Ame...    29.06
Client Solutions Hispanic or Latino (United States of America)         28.51
                 Black or African American (United States of Ame...    26.99
                 Asian (United States of America)                      26.30
Circulation      White (United States of America)                      22.80
                 Black or African American (United States of Ame...    22.36
```

[397]:
```
current_commercial_median_department_race_gender_salaried = commercial_salaried.
 ↪groupby(['department','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_gender_salaried)
```

[397]:
```
count_nonzero  \
department        race_ethnicity                                    gender
Client Solutions White (United States of America)                   Male
22.00
                  Black or African American (United States of Ame... Female
6.00
                  White (United States of America)                  Female
57.00
                  Asian (United States of America)                  Female
5.00

median
department        race_ethnicity                                    gender
Client Solutions White (United States of America)                   Male
98893.80
                  Black or African American (United States of Ame... Female
92158.00
                  White (United States of America)                  Female
86613.00
                  Asian (United States of America)                  Female
80000.00
```

[398]:
```
current_commercial_median_department_race_gender_hourly = commercial_hourly.
 ↪groupby(['department','race_ethnicity','gender']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_gender_hourly)
```

[398]:
```
count_nonzero  \
department        race_ethnicity                                    gender
Client Solutions White (United States of America)                   Female
13.00
                                                                    Male
11.00
Finance           Black or African American (United States of Ame... Female
12.00
Client Solutions Hispanic or Latino (United States of America)      Female
6.00
                  Black or African American (United States of Ame... Male
9.00
                                                                    Female
16.00
Circulation       Black or African American (United States of Ame... Female
9.00
                  White (United States of America)                  Male
8.00
                  Black or African American (United States of Ame... Male
26.00
```

```
median
department       race_ethnicity                                    gender
Client Solutions White (United States of America)                  Female
31.68
                                                                   Male
30.77
Finance          Black or African American (United States of Ame... Female
29.06
Client Solutions Hispanic or Latino (United States of America)     Female
28.51
                 Black or African American (United States of Ame... Male
28.16
                                                                   Female
25.95
Circulation      Black or African American (United States of Ame... Female
23.19
                 White (United States of America)                  Male
22.80
                 Black or African American (United States of Ame... Male
22.35
```

[399]:
```
current_commercial_median_department_race_group_gender_salaried =␣
 ↪commercial_salaried.groupby(['department','race_grouping','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suspress_median(current_commercial_median_department_race_group_gender_salaried)
```

[399]:
```
                                        count_nonzero   median
department       race_grouping   gender
Client Solutions white           Male           22.00 98893.80
                                 Female         57.00 86613.00
                 person of color Female         13.00 80000.00
                                 Male            9.00 76139.41
```

[400]:
```
current_commercial_median_department_race_group_gender_hourly =␣
 ↪commercial_hourly.groupby(['department','race_grouping','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_group_gender_hourly)
```

[400]:
```
                                        count_nonzero  median
department       race_grouping   gender
Client Solutions white           Female         13.00   31.68
                                 Male           11.00   30.77
Finance          person of color Female         13.00   28.89
Client Solutions person of color Male           13.00   27.05
                                 Female         25.00   26.34
Circulation      person of color Female          9.00   23.19
                 white           Male            8.00   22.80
                 person of color Male           30.00   22.35
```

[401]:
```
current_commercial_median_department_race_gender_age5_salaried =␣
↪commercial_salaried.
↪groupby(['department','race_ethnicity','gender','age_group_5']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_gender_age5_salaried)
```

[401]:
```
count_nonzero  \
department       race_ethnicity                     gender age_group_5
Client Solutions White (United States of America) Female 35-39
9.00
                                                           40-44
6.00
                                                           50-54
5.00
                                                    Male   30-34
5.00
                                                    Female 25-29
23.00
                                                           <25
6.00

                                                                          median
department       race_ethnicity                     gender age_group_5
Client Solutions White (United States of America) Female 35-39        149101.00
                                                           40-44        126864.75
                                                           50-54        105893.00
                                                    Male   30-34        100000.00
                                                    Female 25-29         75000.00
                                                           <25           61000.00
```

[402]:
```
current_commercial_median_department_race_gender_age5_hourly =␣
↪commercial_hourly.
↪groupby(['department','race_ethnicity','gender','age_group_5']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_gender_age5_hourly)
```

[402]:
```
        count_nonzero  \
department       race_ethnicity                                    gender
age_group_5
Client Solutions White (United States of America)                  Female 25-29
5.00
Circulation      Black or African American (United States of Ame... Male   60-64
6.00
                                                                          45-49
7.00

        median
department       race_ethnicity                                    gender
```

```
age_group_5
Client Solutions White (United States of America)                     Female 25-29
31.84
Circulation      Black or African American (United States of Ame... Male   60-64
23.80
                                                                              45-49
21.51
```

[403]:
```
current_commercial_median_department_race_group_gender_age5_salaried =␣
↪commercial_salaried.
↪groupby(['department','race_grouping','gender','age_group_5']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_group_gender_age5_salaried)
```

[403]:
```
                                                   count_nonzero    median
department       race_grouping gender age_group_5
Client Solutions white         Female 35-39                 9.00 149101.00
                                      40-44                 6.00 126864.75
                                      50-54                 5.00 105893.00
                               Male   30-34                 5.00 100000.00
                               Female 25-29                23.00  75000.00
                                      <25                   6.00  61000.00
```

[404]:
```
current_commercial_median_department_race_group_gender_age5_hourly =␣
↪commercial_hourly.
↪groupby(['department','race_grouping','gender','age_group_5']).
↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_department_race_group_gender_age5_hourly)
```

[404]:
```
                                                     count_nonzero  median
department       race_grouping   gender age_group_5
Client Solutions white           Female 25-29                 5.00   31.84
                 person of color Female 40-44                 5.00   25.05
Circulation      person of color Male   60-64                 6.00   23.80
                                        45-49                 7.00   21.51
                                        50-54                 5.00   20.85
```

1.6.7 Job profiles

[405]:
```
current_commercial_median_job_salaried = commercial_salaried.
↪groupby(['job_profile_current']).agg({'current_base_pay': [np.count_nonzero,␣
↪np.median]})
suppress_median(current_commercial_median_job_salaried)
```

[405]:
```
                                        count_nonzero    median
job_profile_current
450220 - Sales Representative                   25.00 153987.30
350227 - Custom Content Writer                   7.00 100000.00
551104 - Senior Financial Accountant             5.00  90566.00
```

```
450120 - Account Manager                    26.00  88644.94
390110 - Multiplatform Editor                9.00  86104.69
280228 - Designer                            7.00  85000.00
340227 - Artist                              5.00  75035.28
481205 - Digital Analyst                     5.00  75000.00
660127 - Make-Up Person                      5.00  71665.06
231303 - Client Service Manager             15.00  67095.60
```

[406]:

```
current_commercial_median_job_hourly = commercial_hourly.
 ↪groupby(['job_profile_current']).agg({'current_base_pay': [np.count_nonzero,␣
 ↪np.median]})
suppress_median(current_commercial_median_job_hourly)
```

[406]:

```
                                       count_nonzero  median
job_profile_current
341027 - Desktop Publisher                      6.00   30.81
574504 - Senior Accounting Specialist          11.00   30.38
565005 - Accounting Specialist                 12.00   26.59
470121 - Account Executive                     16.00   25.15
600318 - Circulation Driver (Class A)          35.00   22.45
```

[407]:

```
current_commercial_median_job_gender_salaried = commercial_salaried.
 ↪groupby(['job_profile_current','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_commercial_median_job_gender_salaried)
```

[407]:

```
                                        count_nonzero    median
job_profile_current             gender
450220 - Sales Representative   Male             6.00 162338.60
                                Female          19.00 150780.00
450120 - Account Manager        Female          17.00  90110.00
390110 - Multiplatform Editor   Male             5.00  85899.92
450120 - Account Manager        Male             9.00  85417.73
231303 - Client Service Manager Female          13.00  68000.00
```

[408]:

```
current_commercial_median_job_gender_hourly = commercial_hourly.
 ↪groupby(['job_profile_current','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_commercial_median_job_gender_hourly)
```

[408]:

```
                                              count_nonzero  median
job_profile_current                    gender
574504 - Senior Accounting Specialist Female          10.00   30.06
565005 - Accounting Specialist         Male            5.00   27.18
                                       Female          7.00   26.04
470121 - Account Executive             Female         15.00   25.05
600318 - Circulation Driver (Class A) Male            34.00   22.53
```

[409]:

```

```

```
current_commercial_median_job_race_salaried = commercial_salaried.
 ↪groupby(['job_profile_current','race_ethnicity']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_salaried)
```

[409]:
```
    count_nonzero  \
job_profile_current             race_ethnicity
450220 - Sales Representative   White (United States of America)
23.00
350227 - Custom Content Writer  White (United States of America)
6.00
450120 - Account Manager        White (United States of America)
15.00
390110 - Multiplatform Editor   White (United States of America)
8.00
450120 - Account Manager        Black or African American (United States of
Ame...           7.00
231303 - Client Service Manager White (United States of America)
14.00

      median
job_profile_current             race_ethnicity
450220 - Sales Representative   White (United States of America)
150780.00
350227 - Custom Content Writer  White (United States of America)
100000.00
450120 - Account Manager        White (United States of America)
90669.48
390110 - Multiplatform Editor   White (United States of America)
88301.65
450120 - Account Manager        Black or African American (United States of
Ame...  85417.73
231303 - Client Service Manager White (United States of America)
65548.47
```

[410]:
```
current_commercial_median_job_race_hourly = commercial_hourly.
 ↪groupby(['job_profile_current','race_ethnicity']).agg({'current_base_pay':␣
 ↪[np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_hourly)
```

[410]:
```
          count_nonzero  \
job_profile_current                   race_ethnicity
574504 - Senior Accounting Specialist Black or African American (United States
of Ame...            8.00
565005 - Accounting Specialist        Black or African American (United States
of Ame...            7.00
470121 - Account Executive            White (United States of America)
5.00
```

```
                                             Black or African American (United States
of Ame...           9.00
600318 - Circulation Driver (Class A) White (United States of America)
7.00
                                             Black or African American (United States
of Ame...          23.00

          median
job_profile_current                   race_ethnicity
574504 - Senior Accounting Specialist Black or African American (United States
of Ame...   30.06
565005 - Accounting Specialist        Black or African American (United States
of Ame...   26.04
470121 - Account Executive            White (United States of America)
25.36
                                             Black or African American (United States
of Ame...   24.70
600318 - Circulation Driver (Class A) White (United States of America)
22.98
                                             Black or African American (United States
of Ame...   22.36
```

[411]:

```
current_commercial_median_job_race_gender_salaried = commercial_salaried.
 ↪groupby(['job_profile_current','race_ethnicity','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_gender_salaried)
```

[411]:

```
count_nonzero  \
job_profile_current             race_ethnicity                   gender
450220 - Sales Representative   White (United States of America) Male
5.00
                                                                 Female
18.00
450120 - Account Manager        White (United States of America) Female
11.00
231303 - Client Service Manager White (United States of America) Female
12.00

median
job_profile_current             race_ethnicity                   gender
450220 - Sales Representative   White (United States of America) Male
155300.00
                                                                 Female
149940.50
450120 - Account Manager        White (United States of America) Female
90110.00
231303 - Client Service Manager White (United States of America) Female
66000.67
```

[412]:
```
current_commercial_median_job_race_gender_hourly = commercial_hourly.
 ↪groupby(['job_profile_current','race_ethnicity','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_gender_hourly)
```

[412]:
```
                 count_nonzero  \
job_profile_current                   race_ethnicity
gender
574504 - Senior Accounting Specialist Black or African American (United States
of Ame... Female           7.00
565005 - Accounting Specialist        Black or African American (United States
of Ame... Female           5.00
470121 - Account Executive            Black or African American (United States
of Ame... Female           9.00
600318 - Circulation Driver (Class A) White (United States of America)
Male             7.00
                                      Black or African American (United States
of Ame... Male            22.00

                 median
job_profile_current                   race_ethnicity
gender
574504 - Senior Accounting Specialist Black or African American (United States
of Ame... Female   29.74
565005 - Accounting Specialist        Black or African American (United States
of Ame... Female   26.04
470121 - Account Executive            Black or African American (United States
of Ame... Female   24.70
600318 - Circulation Driver (Class A) White (United States of America)
Male     22.98
                                      Black or African American (United States
of Ame... Male     22.39
```

[413]:
```
current_commercial_median_job_race_group_gender_salaried = commercial_salaried.
 ↪groupby(['desk','race_grouping','gender']).agg({'current_base_pay': [np.
 ↪count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_group_gender_salaried)
```

[413]:
```
                                     count_nonzero   median
desk          race_grouping   gender
non-newsroom white            Male           32.00 94496.71
                              Female         67.00 86104.69
              person of color Female         17.00 85000.00
                              Male           15.00 76866.10
```

[414]:
```
current_commercial_median_job_race_group_gender_hourly = commercial_hourly.
 ↪groupby(['job_profile_current','race_grouping','gender']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_group_gender_hourly)
```

[414]:
```
                                                                          count_nonzero  \
job_profile_current                      race_grouping   gender
574504 - Senior Accounting Specialist person of color Female           7.00
565005 - Accounting Specialist         person of color Female           6.00
470121 - Account Executive             person of color Female          11.00
600318 - Circulation Driver (Class A) white           Male             7.00
                                      person of color Male            26.00

                                                                          median
job_profile_current                      race_grouping   gender
574504 - Senior Accounting Specialist person of color Female   29.74
565005 - Accounting Specialist         person of color Female   25.84
470121 - Account Executive             person of color Female   24.70
600318 - Circulation Driver (Class A) white           Male     22.98
                                      person of color Male     22.39
```

[415]:
```
current_commercial_median_job_race_gender_age5_salaried = commercial_salaried.
 ↪groupby(['job_profile_current','race_ethnicity','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_gender_age5_salaried)
```

[415]:
```
     count_nonzero  \
job_profile_current            race_ethnicity                     gender
age_group_5
450220 - Sales Representative   White (United States of America) Female 35-39
8.00
231303 - Client Service Manager White (United States of America) Female 25-29
8.00

       median
job_profile_current            race_ethnicity                     gender
age_group_5
450220 - Sales Representative   White (United States of America) Female 35-39
149940.50
231303 - Client Service Manager White (United States of America) Female 25-29
66212.61
```

[416]:
```
current_commercial_median_job_race_gender_age5_hourly = commercial_hourly.
 ↪groupby(['job_profile_current','race_ethnicity','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_gender_age5_hourly)
```

[416]:
```
                                             count_nonzero  \
job_profile_current                      race_ethnicity
gender age_group_5
600318 - Circulation Driver (Class A) Black or African American (United States
of Ame... Male   60-64                    6.00
                 45-49                    7.00
```

```
                             median
job_profile_current                    race_ethnicity
gender age_group_5
600318 - Circulation Driver (Class A) Black or African American (United States
of Ame... Male   60-64         23.80
                45-49         21.51
```

[417]:
```
current_commercial_median_job_race_group_gender_age5_salaried =␣
 ↪commercial_salaried.
 ↪groupby(['job_profile_current','race_grouping','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_group_gender_age5_salaried)
```

[417]:
```
                                                                 count_nonzero
\
job_profile_current             race_grouping gender age_group_5
450220 - Sales Representative   white         Female 35-39                8.00
231303 - Client Service Manager white         Female 25-29                8.00


                                                                   median
job_profile_current             race_grouping gender age_group_5
450220 - Sales Representative   white         Female 35-39      149940.50
231303 - Client Service Manager white         Female 25-29       66212.61
```

[418]:
```
current_commercial_median_job_race_group_gender_age5_hourly = commercial_hourly.
 ↪groupby(['job_profile_current','race_grouping','gender','age_group_5']).
 ↪agg({'current_base_pay': [np.count_nonzero, np.median]})
suppress_median(current_commercial_median_job_race_group_gender_age5_hourly)
```

[418]:
```
count_nonzero  \
job_profile_current                   race_grouping   gender age_group_5
600318 - Circulation Driver (Class A) person of color Male   60-64
6.00
                                                              45-49
7.00


                                                                         median
job_profile_current                   race_grouping   gender age_group_5
600318 - Circulation Driver (Class A) person of color Male   60-64          23.80
                                                              45-49          21.51
```

1.6.8 Performance evaluations

[419]:
```
commercial_ratings = ratings_combined[ratings_combined['dept'] == "Commercial"]
```

[420]:
```
commercial_ratings_gender = commercial_ratings.groupby(['gender']).
 ↪agg({'performance_rating': [np.count_nonzero, np.median]})
commercial_ratings_gender
```

[420]:
```
        performance_rating
             count_nonzero median
gender
Female             1308.00   3.30
Male                984.00   3.20
```

[421]:
```
commercial_ratings_race = commercial_ratings.groupby(['race_ethnicity']).
 ↪agg({'performance_rating': [np.count_nonzero, np.median]})
suppress_median(commercial_ratings_race)
```

[421]:
```
                                                    count_nonzero  median
race_ethnicity
Asian (United States of America)                           168.00    3.30
Two or More Races (United States of America)                36.00    3.30
White (United States of America)                          1096.00    3.30
Black or African American (United States of Ame...         860.00    3.20
Hispanic or Latino (United States of America)               96.00    3.15
Prefer Not to Disclose (United States of America)           28.00    3.00
```

[422]:
```
commercial_ratings_race_gender = commercial_ratings.
 ↪groupby(['race_ethnicity','gender']).agg({'performance_rating': [np.
 ↪count_nonzero, np.median]})
suppress(commercial_ratings_race_gender)
```

[422]:
```
                                                                count_nonzero  \
race_ethnicity                                      gender
Asian (United States of America)                    Female             116.00
                                                    Male                52.00
Black or African American (United States of Ame... Female             408.00
                                                    Male               452.00
Hispanic or Latino (United States of America)       Female              56.00
                                                    Male                40.00
Prefer Not to Disclose (United States of America)   Female              16.00
                                                    Male                12.00
Two or More Races (United States of America)        Female              20.00
                                                    Male                16.00
White (United States of America)                    Female             684.00
                                                    Male               412.00

                                                                median
race_ethnicity                                      gender
Asian (United States of America)                    Female       3.30
                                                    Male         3.10
Black or African American (United States of Ame... Female       3.20
                                                    Male         3.05
Hispanic or Latino (United States of America)       Female       3.15
                                                    Male         3.10
Prefer Not to Disclose (United States of America)   Female       3.00
                                                    Male          nan
```

```
Two or More Races (United States of America)       Female    3.30
                                                    Male      3.35
White (United States of America)                    Female    3.30
                                                    Male      3.30
```

1.6.9 Pay changes

[423]:
```
commercial_change =␣
↪reason_for_change_combined[reason_for_change_combined['dept'] ==␣
↪'Commercial']
```

[424]:
```
commercial_change_gender = commercial_change.
↪groupby(['business_process_reason','gender']).agg({'business_process_reason':
↪ [np.count_nonzero]})
suppress_count(commercial_change_gender)
```

[424]:
```
                                                            count_nonzero
business_process_reason                             gender
Request Compensation Change > Adjustment > Cont... Female             475
                                                    Male               354
Merit > Performance > Annual Performance Appraisal Female             295
                                                    Male               228
Request Compensation Change > Adjustment > Chan... Female             198
Promotion > Promotion > Promotion                   Female             144
Transfer > Transfer > Move to another Manager       Female             123
                                                    Male               114
Data Change > Data Change > Change Job Details      Female              85
Request Compensation Change > Adjustment > Chan... Male                85
Hire Employee > New Hire > Fill Vacancy             Female              70
Request Compensation Change > Adjustment > Mark... Female              64
Data Change > Data Change > Change Job Details      Male                61
Hire Employee > New Hire > Fill Vacancy             Male                58
Promotion > Promotion > Promotion                   Male                52
Hire Employee > New Hire > New Position             Female              31
                                                    Male                22
Request Compensation Change > Adjustment > Mark... Male                20
Transfer > Transfer > Transfer between companies    Female              18
Request Compensation Change > Adjustment > Incr... Male                15
                                                    Female              11
Request Compensation Change > Adjustment > Job ... Female               9
Request Compensation Change > Adjustment > Perf... Male                 7
                                                    Female               6
Hire Employee > New Hire > Conversion               Female               6
Hire Employee > Rehire > Fill Vacancy               Female               6
Request Compensation Change > Adjustment > Job ... Male                 5
```

[425]:
```

```

```
commercial_change_race =␣
↪commercial_change[commercial_change['business_process_reason'] == 'Merit >␣
↪Performance > Annual Performance Appraisal'].
↪groupby(['business_process_reason','race_ethnicity']).
↪agg({'business_process_reason': [np.count_nonzero]})
suppress_count(commercial_change_race)
```

[425]:

```
                              count_nonzero
business_process_reason                                race_ethnicity
Merit > Performance > Annual Performance Appraisal Black or African American
(United States of Ame...           239
                                                       White (United States of
America)                               220
                                                       Asian (United States of
America)                                36
                                                       Hispanic or Latino (United
States of America)                   19
```

[426]:

```
commercial_change_race_gender =␣
↪commercial_change[commercial_change['business_process_reason'] == 'Merit >␣
↪Performance > Annual Performance Appraisal'].
↪groupby(['business_process_reason','race_ethnicity','gender']).
↪agg({'business_process_reason': [np.count_nonzero]})
suppress_count(commercial_change_race_gender)
```

[426]:

```
                                     count_nonzero
business_process_reason                                race_ethnicity
gender
Merit > Performance > Annual Performance Appraisal White (United States of
America)                       Female              132
                                                       Black or African American
(United States of Ame... Female              126
                      Male               113
                                                       White (United States of
America)                       Male                 88
                                                       Asian (United States of
America)                       Female               19
                      Male                17
                                                       Hispanic or Latino (United
States of America)       Male                 10
                      Female               9
```

1.6.10 Performance evaluations x merit raises

[427]:

```
import re
reason_for_change_combined['merit_raises'] =␣
↪reason_for_change_combined['business_process_reason'].str.contains('Merit',␣
↪re.IGNORECASE)
```

[428]:
```
twenty14 = np.datetime64('2016-04-01')
twenty15 = np.datetime64('2017-04-01')
twenty16 = np.datetime64('2018-04-01')
twenty17 = np.datetime64('2019-04-01')
twenty18 = np.datetime64('2020-04-01')

def raise_time(row):
    if row['effective_date'] < twenty14:
        return 'before 2015'
    if row['effective_date'] < twenty15:
        return '2015'
    if row['effective_date'] < twenty16:
        return '2016'
    if row['effective_date'] < twenty17:
        return '2017'
    if row['effective_date'] < twenty18:
        return '2018'
    return 'unknown'

reason_for_change_combined['raise_after'] = reason_for_change_combined.
 ↪apply(lambda row: raise_time(row), axis=1)
```

[429]:
```
merit_raises_commercial_gender_salaried =␣
 ↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
 ↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
 ↪(reason_for_change_combined['pay_rate_type'] == 'Salaried')].
 ↪groupby(['gender']).agg({'base_pay_change': [np.count_nonzero, np.median]})
merit_raises_commercial_gender_salaried
```

[429]:
```
       base_pay_change
         count_nonzero  median
gender
Female           97.00 1317.48
Male             74.00 1205.07
```

[430]:
```
merit_raises_commercial_gender_hourly =␣
 ↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
 ↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
 ↪(reason_for_change_combined['pay_rate_type'] == 'Hourly')].
 ↪groupby(['gender']).agg({'base_pay_change': [np.count_nonzero, np.median]})
merit_raises_commercial_gender_hourly
```

[430]:
```
       base_pay_change
         count_nonzero median
gender
Female          170.00   0.42
Male            138.00   0.33
```

[431]:
```
merit_raises_commercial_race_salaried =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried')].
↪groupby(['race_ethnicity']).agg({'base_pay_change': [np.count_nonzero, np.
↪median]})
suppress_median(merit_raises_commercial_race_salaried)
```

[431]:
```
                                                   count_nonzero  median
race_ethnicity
Asian (United States of America)                           23.00 1375.00
Hispanic or Latino (United States of America)               6.00 1321.85
White (United States of America)                          110.00 1286.88
Black or African American (United States of Ame...         30.00 1117.12
```

[432]:
```
merit_raises_commercial_race_hourly =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Hourly')].
↪groupby(['race_ethnicity']).agg({'base_pay_change': [np.count_nonzero, np.
↪median]})
suppress_median(merit_raises_commercial_race_hourly)
```

[432]:
```
                                                   count_nonzero  median
race_ethnicity
Asian (United States of America)                           11.00    0.45
White (United States of America)                           85.00    0.42
Hispanic or Latino (United States of America)              11.00    0.37
Black or African American (United States of Ame...        197.00    0.35
```

[433]:
```
merit_raises_commercial_race_group_salaried =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried')].
↪groupby(['race_grouping']).agg({'base_pay_change': [np.count_nonzero, np.
↪median]})
suppress_median(merit_raises_commercial_race_group_salaried)
```

[433]:
```
                 count_nonzero  median
race_grouping
white                   110.00 1286.88
person of color          60.00 1225.00
```

[434]:
```
merit_raises_commercial_race_group_hourly =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Hourly')].
↪groupby(['race_grouping']).agg({'base_pay_change': [np.count_nonzero, np.
↪median]})
suppress_median(merit_raises_commercial_race_group_hourly)
```

[434]:
```
                    count_nonzero  median
race_grouping
white                       85.00    0.42
person of color            223.00    0.35
```

[435]:
```
merit_raises_commercial_gender_race_group_salaried =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]})
suppress_median(merit_raises_commercial_gender_race_group_salaried)
```

[435]:
```
                       count_nonzero  median
gender race_grouping
Female white                   69.00 1317.48
       person of color         27.00 1305.00
Male   white                   41.00 1282.47
       person of color         33.00 1134.24
```

[436]:
```
merit_raises_commercial_gender_race_group_hourly =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Hourly')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]})
suppress_median(merit_raises_commercial_gender_race_group_hourly)
```

[436]:
```
                       count_nonzero  median
gender race_grouping
Female white                   44.00    0.52
       person of color        126.00    0.38
Male   white                   41.00    0.35
       person of color         97.00    0.32
```

[437]:
```
fifteen_raises =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2015')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]},{'2015_annual_performance_rating': [np.
↪count_nonzero, np.median]})
suppress(fifteen_raises)
```

[437]:
```
                     count_nonzero  median
gender race_grouping
Female white                  7.00  937.13
Male   white                  5.00  850.75
```

[438]:
```
fifteen_raises =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2015')].
↪groupby(['gender','race_grouping']).agg({'2015_annual_performance_rating':␣
↪[np.count_nonzero, np.median]})
suppress(fifteen_raises)
```

[438]:
```
                      count_nonzero  median
gender race_grouping
Female white                   7.00    3.50
Male   white                   5.00    3.50
```

[439]:
```
sixteen_raises =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2016')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]},{'2016_annual_performance_rating': [np.
↪count_nonzero, np.median]})
suppress(sixteen_raises)
```

[439]:
```
                        count_nonzero  median
gender race_grouping
Female person of color           5.00 1729.40
       white                     9.00 1683.00
Male   person of color           6.00 1506.78
       white                     7.00 1291.29
```

[440]:
```
sixteen_raises =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2016')].
↪groupby(['gender','race_grouping']).agg({'2016_annual_performance_rating':␣
↪[np.count_nonzero, np.median]})
suppress(sixteen_raises)
```

[440]:
```
                        count_nonzero  median
gender race_grouping
Female person of color           5.00    3.50
       white                     9.00    3.40
Male   person of color           6.00    3.25
       white                     7.00    3.20
```

[441]:
```

```

```
seventeen_raises =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2017')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]},{'2017_annual_performance_rating': [np.
↪count_nonzero, np.median]})
suppress(seventeen_raises)
```

[441]:

```
                       count_nonzero  median
gender race_grouping
Female white                   13.00 1398.48
Male   person of color          8.00 1000.00
       white                    5.00 1414.60
```

[442]:

```
seventeen_raises =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2017')].
↪groupby(['gender','race_grouping']).agg({'2017_annual_performance_rating':␣
↪[np.count_nonzero, np.median]})
suppress(seventeen_raises)
```

[442]:

```
                       count_nonzero  median
gender race_grouping
Female white                   13.00    3.30
Male   person of color          8.00    3.15
       white                    5.00    3.40
```

[443]:

```
eighteen_raises =␣
↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
↪(reason_for_change_combined['raise_after'] == '2018')].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]},{'2018_annual_performance_rating': [np.
↪count_nonzero, np.median]})
suppress(eighteen_raises)
```

[443]:

```
                       count_nonzero  median
gender race_grouping
Female person of color          7.00 1415.60
       white                   21.00 1668.88
Male   person of color          7.00 1050.00
       white                    8.00 1417.48
```

[444]:

```
eighteen_raises =␣
 ↪reason_for_change_combined[(reason_for_change_combined['merit_raises'] ==␣
 ↪True) & (reason_for_change_combined['dept'] == 'Commercial') &␣
 ↪(reason_for_change_combined['pay_rate_type'] == 'Salaried') &␣
 ↪(reason_for_change_combined['raise_after'] == '2018')].
 ↪groupby(['gender','race_grouping']).agg({'2018_annual_performance_rating':␣
 ↪[np.count_nonzero, np.median]})
suppress(eighteen_raises)
```

[444]:

```
                             count_nonzero  median
gender race_grouping
Female person of color                7.00    3.40
       white                         21.00    3.50
Male   person of color                7.00    3.30
       white                          8.00    3.50
```

[445]:

```
merit_raises_15 =␣
 ↪reason_for_change_combined[(reason_for_change_combined['raise_after'] ==␣
 ↪'2015') & (reason_for_change_combined['merit_raises'] == True)]
merit_raises_16 =␣
 ↪reason_for_change_combined[(reason_for_change_combined['raise_after'] ==␣
 ↪'2016') & (reason_for_change_combined['merit_raises'] == True)]
merit_raises_17 =␣
 ↪reason_for_change_combined[(reason_for_change_combined['raise_after'] ==␣
 ↪'2017') & (reason_for_change_combined['merit_raises'] == True)]
merit_raises_18 =␣
 ↪reason_for_change_combined[(reason_for_change_combined['raise_after'] ==␣
 ↪'2018') & (reason_for_change_combined['merit_raises'] == True)]

merit_raises_15 =␣
 ↪merit_raises_15[['base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping
 ↪rename(columns={'2015_annual_performance_rating':'performance_rating'})
merit_raises_16 =␣
 ↪merit_raises_16[['base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping
 ↪rename(columns={'2016_annual_performance_rating':'performance_rating'})
merit_raises_17 =␣
 ↪merit_raises_17[['base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping
 ↪rename(columns={'2017_annual_performance_rating':'performance_rating'})
merit_raises_18 =␣
 ↪merit_raises_18[['base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping
 ↪rename(columns={'2018_annual_performance_rating':'performance_rating'})

merit_raises_15 = pd.DataFrame(merit_raises_15)
merit_raises_16 = pd.DataFrame(merit_raises_16)
merit_raises_17 = pd.DataFrame(merit_raises_17)
merit_raises_18 = pd.DataFrame(merit_raises_18)
```

```
merit_raises_combined = pd.
↪concat([merit_raises_15,merit_raises_16,merit_raises_17,merit_raises_18])
```

[446]:
```
commercial_salaried_raises =␣
↪merit_raises_combined[merit_raises_combined['pay_rate_type'] == 'Salaried'].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]})
suppress(commercial_salaried_raises)
```

[446]:
```
                       count_nonzero  median
gender race_grouping
Female person of color        116.00 2812.50
       unknown                 10.00 2860.00
       white                  317.00 2500.00
Male   person of color        102.00 2310.00
       unknown                  7.00 2500.00
       white                  379.00 3000.00
```

[447]:
```
commercial_salaried_raises_scores =␣
↪merit_raises_combined[merit_raises_combined['pay_rate_type'] == 'Salaried'].
↪groupby(['gender','race_grouping']).agg({'performance_rating': [np.
↪count_nonzero, np.median]})
suppress(commercial_salaried_raises_scores)
```

[447]:
```
                       count_nonzero  median
gender race_grouping
Female person of color        116.00    3.40
       unknown                 10.00    3.80
       white                  317.00    3.50
Male   person of color        102.00    3.40
       unknown                  7.00    3.70
       white                  379.00    3.60
```

[448]:
```
commercial_hourly_raises =␣
↪merit_raises_combined[merit_raises_combined['pay_rate_type'] == 'Hourly'].
↪groupby(['gender','race_grouping']).agg({'base_pay_change': [np.
↪count_nonzero, np.median]})
suppress(commercial_hourly_raises)
```

[448]:
```
                       count_nonzero  median
gender race_grouping
Female person of color        120.00    0.43
       white                   88.00    0.78
Male   person of color        108.00    0.35
       white                   65.00    0.45
```

[449]:
```
commercial_hourly_raises_scores =␣
↪merit_raises_combined[merit_raises_combined['pay_rate_type'] == 'Hourly'].
↪groupby(['gender','race_grouping']).agg({'performance_rating': [np.
↪count_nonzero, np.median]})
```

```
suppress(commercial_hourly_raises_scores)
```

[449]:
```
                              count_nonzero  median
gender race_grouping
Female person of color               120.00    3.30
       white                          88.00    3.50
Male   person of color               108.00    3.20
       white                          65.00    3.30
```

1.6.11 Regression

[450]:
```
commercial_salaried_regression =␣
 ↪commercial_salaried[['department','gender','race_ethnicity','current_base_pay','job_profile
commercial_salaried_regression = pd.get_dummies(commercial_salaried_regression,␣
 ↪columns=['gender','race_ethnicity','age_group_5','years_of_service_grouped','dept','desk','
```

[451]:
```
commercial_salaried_regression = commercial_salaried_regression.
 ↪rename(columns={'race_grouping_person of color':
 ↪'race_grouping_person_of_color','age_group_5_<25':
 ↪'age_group_5_25_under','age_group_5_25-29':
 ↪'age_group_5_25to29','age_group_5_30-34':
 ↪'age_group_5_30to34','age_group_5_35-39':
 ↪'age_group_5_35to39','age_group_5_40-44':
 ↪'age_group_5_40to44','age_group_5_45-49':
 ↪'age_group_5_45to49','age_group_5_50-54':
 ↪'age_group_5_50to54','age_group_5_55-59':
 ↪'age_group_5_55to59','age_group_5_60-64':
 ↪'age_group_5_60to64','age_group_5_65+':'age_group_5_65_over','tier_Tier 1':
 ↪'tier_Tier_1','tier_Tier 2':'tier_Tier_2','tier_Tier 3':
 ↪'tier_Tier_3','tier_Tier 4':'tier_Tier_4','years_of_service_grouped_0':
 ↪'years_of_service_grouped_0','years_of_service_grouped_1-2':
 ↪'years_of_service_grouped_1to2','years_of_service_grouped_3-5':
 ↪'years_of_service_grouped_3to5','years_of_service_grouped_6-10':
 ↪'years_of_service_grouped_6to10','years_of_service_grouped_11-15':
 ↪'years_of_service_grouped_11to15','years_of_service_grouped_16-20':
 ↪'years_of_service_grouped_16to20','years_of_service_grouped_21-25':
 ↪'years_of_service_grouped_21to25','years_of_service_grouped_25+':
 ↪'years_of_service_grouped_25_over'})
import statsmodels.formula.api as sm
model41 = sm.ols(data=commercial_salaried_regression, formula =␣
 ↪'current_base_pay ~ gender_Female + gender_Male')
result41 = model41.fit()
result41.summary()
```

[451]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
```

```
Dep. Variable:       current_base_pay   R-squared:                       0.001
Model:                            OLS   Adj. R-squared:                 -0.007
Method:                 Least Squares   F-statistic:                   0.07662
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.782
Time:                        10:28:08   Log-Likelihood:                -1577.9
No. Observations:                 133   AIC:                             3160.
Df Residuals:                     131   BIC:                             3166.
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                   coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept     6.382e+04   2093.898     30.480      0.000    5.97e+04
6.8e+04
gender_Female 3.278e+04   3005.419     10.907      0.000    2.68e+04
3.87e+04
gender_Male   3.104e+04   3590.196      8.646      0.000    2.39e+04
3.81e+04
==============================================================================
Omnibus:                       30.714   Durbin-Watson:                   1.641
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               42.867
Skew:                           1.285   Prob(JB):                     4.92e-10
Kurtosis:                       4.064   Cond. No.                     3.62e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.58e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[452]:

```
model42 = sm.ols(data=commercial_salaried_regression, formula =
 ↪'current_base_pay ~ race_grouping_white + race_grouping_person_of_color')
result42 = model42.fit()
result42.summary()
```

[452]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.025
Model:                            OLS   Adj. R-squared:                  0.010
Method:                 Least Squares   F-statistic:                     1.645
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.197
```

```
Time:                        10:28:09   Log-Likelihood:                -1576.3
No. Observations:                 133   AIC:                             3159.
Df Residuals:                     130   BIC:                             3167.
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                 coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                    7.84e+04   2.43e+04      3.229      0.002
3.04e+04    1.26e+05
race_grouping_white         2.068e+04   2.45e+04      0.843      0.401
-2.78e+04    6.92e+04
race_grouping_person_of_color  9089.4666    2.5e+04      0.363      0.717
-4.04e+04    5.86e+04
==============================================================================
Omnibus:                       28.825   Durbin-Watson:                   1.642
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               39.096
Skew:                           1.238   Prob(JB):                     3.24e-09
Kurtosis:                       3.964   Cond. No.                         18.2
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[453]:

```
model43 = sm.ols(data=commercial_salaried_regression, formula =
 'current_base_pay ~ gender_Female + gender_Male + race_grouping_white +
 race_grouping_person_of_color')
result43 = model43.fit()
result43.summary()
```

[453]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        current_base_pay   R-squared:                       0.025
Model:                             OLS   Adj. R-squared:                  0.002
Method:                  Least Squares   F-statistic:                     1.094
Date:                 Wed, 06 Nov 2019   Prob (F-statistic):              0.354
Time:                         10:28:09   Log-Likelihood:                -1576.3
No. Observations:                  133   AIC:                             3161.
Df Residuals:                      129   BIC:                             3172.
Df Model:                            3
Covariance Type:             nonrobust
```

```
==============================================================================
=================
                                 coef    std err          t      P>|t|
[0.025      0.975]
------------------------------------------------------------------------------
-----------------
Intercept                   5.199e+04   1.64e+04      3.173      0.002
1.96e+04    8.44e+04
gender_Female               2.641e+04   8394.824      3.146      0.002
9802.570     4.3e+04
gender_Male                 2.558e+04   9156.599      2.794      0.006
7463.076    4.37e+04
race_grouping_white         2.095e+04   2.47e+04      0.848      0.398
-2.79e+04    6.98e+04
race_grouping_person_of_color  9479.6077   2.53e+04      0.375      0.709
-4.06e+04    5.95e+04
==============================================================================
Omnibus:                       28.760   Durbin-Watson:                   1.640
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               38.975
Skew:                           1.234   Prob(JB):                     3.44e-09
Kurtosis:                       3.969   Cond. No.                     4.64e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.36e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[454]:

```
new_commercial_salaried_regression = pd.DataFrame({'gender_Female': [1,0,1,0],
 'gender_Male': [0,1,0,1], 'race_grouping_white': [1,1,0,0],
 'race_grouping_person_of_color': [0,0,1,1], 'age': [40,40,40,40]})
new_commercial_salaried_regression['predicted'] = result43.
 predict(new_commercial_salaried_regression)
new_commercial_salaried_regression
```

[454]:

```
   gender_Female  gender_Male  race_grouping_white  \
0              1            0                    1
1              0            1                    1
2              1            0                    0
3              0            1                    0

   race_grouping_person_of_color  age  predicted
0                              0   40   99356.99
1                              0   40   98524.69
2                              1   40   87883.11
3                              1   40   87050.81
```

[455]:
```
model44 = sm.ols(data=commercial_salaried_regression, formula =␣
↪'current_base_pay ~ gender_Female + gender_Male + age_group_5_25_under +␣
↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result44 = model44.fit()
result44.summary()
```

[455]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.286
Model:                            OLS   Adj. R-squared:                  0.227
Method:                 Least Squares   F-statistic:                     4.882
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           6.47e-06
Time:                        10:28:09   Log-Likelihood:                -1555.5
No. Observations:                 133   AIC:                             3133.
Df Residuals:                     122   BIC:                             3165.
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept             6.157e+04   2123.471     28.997      0.000    5.74e+04
6.58e+04
gender_Female         3.556e+04   3023.460     11.762      0.000    2.96e+04
4.15e+04
gender_Male           2.601e+04   3274.551      7.944      0.000    1.95e+04
3.25e+04
age_group_5_25_under -3.072e+04   9309.126     -3.300      0.001   -4.91e+04
-1.23e+04
age_group_5_25to29   -1.766e+04   5809.577     -3.040      0.003   -2.92e+04
-6162.194
age_group_5_30to34    2.149e+04   7531.035      2.853      0.005    6579.270
3.64e+04
age_group_5_35to39    2.277e+04   7189.104      3.168      0.002    8540.680
3.7e+04
age_group_5_40to44    2.951e+04   9833.731      3.001      0.003       1e+04
4.9e+04
age_group_5_45to49    9655.6318   8217.596      1.175      0.242   -6611.919
2.59e+04
age_group_5_50to54   -1292.9123   9239.767     -0.140      0.889   -1.96e+04
1.7e+04
```

```
age_group_5_55to59    2092.0604   9214.844      0.227      0.821   -1.61e+04
2.03e+04
age_group_5_60to64    2143.0157   9259.587      0.231      0.817   -1.62e+04
2.05e+04
age_group_5_65_over   2.359e+04   1.99e+04      1.187      0.238   -1.58e+04
6.29e+04
==============================================================================
Omnibus:                       14.188   Durbin-Watson:                   1.771
Prob(Omnibus):                  0.001   Jarque-Bera (JB):               15.735
Skew:                           0.720   Prob(JB):                     0.000383
Kurtosis:                       3.874   Cond. No.                     9.78e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.37e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[456]:
```python
model45 = sm.ols(data=commercial_salaried_regression, formula =
 ↪'current_base_pay ~ race_grouping_white + race_grouping_person_of_color +
 ↪age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +
 ↪age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
 ↪age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
 ↪age_group_5_65_over')
result45 = model45.fit()
result45.summary()
```

[456]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        current_base_pay   R-squared:                       0.335
Model:                             OLS   Adj. R-squared:                  0.275
Method:                  Least Squares   F-statistic:                     5.549
Date:                 Wed, 06 Nov 2019   Prob (F-statistic):           3.83e-07
Time:                         10:28:09   Log-Likelihood:                -1550.8
No. Observations:                  133   AIC:                             3126.
Df Residuals:                      121   BIC:                             3160.
Df Model:                           11
Covariance Type:             nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
```

```
Intercept                        5.016e+04   1.97e+04      2.553      0.012
1.13e+04    8.91e+04
race_grouping_white              4.933e+04   2.18e+04      2.264      0.025
6197.218    9.25e+04
race_grouping_person_of_color    3.255e+04   2.23e+04      1.462      0.146
-1.15e+04    7.66e+04
age_group_5_25_under            -3.33e+04   9266.922     -3.594      0.000
-5.16e+04    -1.5e+04
age_group_5_25to29              -1.83e+04   5876.870     -3.114      0.002
-2.99e+04   -6663.337
age_group_5_30to34               2.118e+04   7351.305      2.882      0.005
6630.956    3.57e+04
age_group_5_35to39                2.03e+04   7310.811      2.777      0.006
5830.557    3.48e+04
age_group_5_40to44                3.53e+04   9345.043      3.778      0.000
1.68e+04    5.38e+04
age_group_5_45to49               1.064e+04   8367.434      1.271      0.206
-5926.784    2.72e+04
age_group_5_50to54             -4834.2752   9266.922     -0.522      0.603
-2.32e+04    1.35e+04
age_group_5_55to59             -1681.1728   9219.577     -0.182      0.856
-1.99e+04    1.66e+04
age_group_5_60to64               771.0941   9248.687      0.083      0.934
-1.75e+04    1.91e+04
age_group_5_65_over              2.007e+04   1.92e+04      1.044      0.298
-1.8e+04    5.81e+04
==============================================================================
Omnibus:                       10.496   Durbin-Watson:                   1.847
Prob(Omnibus):                  0.005   Jarque-Bera (JB):               10.654
Skew:                           0.624   Prob(JB):                      0.00486
Kurtosis:                       3.606   Cond. No.                     8.32e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 3.44e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[457]:
```
model46 = sm.ols(data=commercial_salaried_regression, formula =
 ↪'current_base_pay ~ gender_Female + gender_Male + race_grouping_white +
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +
 ↪age_group_5_60to64 + age_group_5_65_over')
result46 = model46.fit()
```

```python
result46.summary()
```

[457]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        current_base_pay   R-squared:                       0.350
Model:                             OLS   Adj. R-squared:                  0.285
Method:                  Least Squares   F-statistic:                     5.377
Date:                 Wed, 06 Nov 2019   Prob (F-statistic):           3.10e-07
Time:                         10:28:09   Log-Likelihood:                -1549.3
No. Observations:                  133   AIC:                             3125.
Df Residuals:                      120   BIC:                             3162.
Df Model:                           12
Covariance Type:             nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      3.231e+04   1.35e+04      2.396      0.018
5616.362     5.9e+04
gender_Female                  2.084e+04   7063.061      2.950      0.004
6853.164    3.48e+04
gender_Male                    1.148e+04   7585.687      1.513      0.133
-3541.955    2.65e+04
race_grouping_white            5.196e+04   2.17e+04      2.394      0.018
8994.931    9.49e+04
race_grouping_person_of_color  3.599e+04   2.22e+04      1.620      0.108
-7990.410       8e+04
age_group_5_25_under          -3.713e+04   9182.537     -4.044      0.000
-5.53e+04    -1.9e+04
age_group_5_25to29            -2.248e+04   5886.452     -3.819      0.000
-3.41e+04   -1.08e+04
age_group_5_30to34             1.967e+04   7265.155      2.707      0.008
5285.087    3.41e+04
age_group_5_35to39             1.914e+04   7117.210      2.689      0.008
5044.537    3.32e+04
age_group_5_40to44             3.083e+04   9477.598      3.253      0.001
1.21e+04    4.96e+04
age_group_5_45to49             8960.7507   8174.413      1.096      0.275
-7224.019    2.51e+04
age_group_5_50to54            -7729.4680   9113.273     -0.848      0.398
-2.58e+04    1.03e+04
age_group_5_55to59            -2785.8549   9032.997     -0.308      0.758
-2.07e+04    1.51e+04
```

```
age_group_5_60to64              439.3267   9088.523      0.048      0.962
-1.76e+04    1.84e+04
age_group_5_65_over             2.34e+04   1.92e+04      1.218      0.226
-1.46e+04    6.15e+04
==============================================================================
Omnibus:                       11.570   Durbin-Watson:                   1.829
Prob(Omnibus):                  0.003   Jarque-Bera (JB):               12.088
Skew:                           0.647   Prob(JB):                      0.00237
Kurtosis:                       3.712   Cond. No.                     1.28e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.89e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[458]:
```
merit_raises_combined_salaried_regression =␣
 ↪merit_raises_combined[(merit_raises_combined['dept'] == 'Commercial') &␣
 ↪(merit_raises_combined['pay_rate_type'] == 'Salaried')]
merit_raises_combined_salaried_regression = pd.
 ↪get_dummies(merit_raises_combined_salaried_regression,␣
 ↪columns=['gender','race_grouping','age_group_5'])
```

[459]:
```
merit_raises_combined_salaried_regression =␣
 ↪merit_raises_combined_salaried_regression.
 ↪rename(columns={'race_grouping_person of color':
 ↪'race_grouping_person_of_color','age_group_5_<25':
 ↪'age_group_5_25_under','age_group_5_25-29':
 ↪'age_group_5_25to29','age_group_5_30-34':
 ↪'age_group_5_30to34','age_group_5_35-39':
 ↪'age_group_5_35to39','age_group_5_40-44':
 ↪'age_group_5_40to44','age_group_5_45-49':
 ↪'age_group_5_45to49','age_group_5_50-54':
 ↪'age_group_5_50to54','age_group_5_55-59':
 ↪'age_group_5_55to59','age_group_5_60-64':
 ↪'age_group_5_60to64','age_group_5_65+':'age_group_5_65_over'})
model47 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'base_pay_change ~ gender_Female + gender_Male')
result47 = model47.fit()
result47.summary()
```

[459]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:         base_pay_change   R-squared:                       0.022
```

```
Model:                            OLS   Adj. R-squared:                  0.014
Method:                 Least Squares   F-statistic:                     2.664
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.105
Time:                        10:28:09   Log-Likelihood:                -999.84
No. Observations:                 120   AIC:                             2004.
Df Residuals:                     118   BIC:                             2009.
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                    coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept      1002.1929     62.763     15.968      0.000     877.905
1126.480
gender_Female   654.7617     93.620      6.994      0.000     469.369
840.154
gender_Male     347.4312    104.552      3.323      0.001     140.389
554.473
==============================================================================
Omnibus:                       63.911   Durbin-Watson:                   1.948
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              203.112
Skew:                           2.035   Prob(JB):                     7.85e-45
Kurtosis:                       7.905   Cond. No.                     3.59e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.42e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[460]:
```
model48 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'base_pay_change ~ race_grouping_white + race_grouping_person_of_color')
result48 = model48.fit()
result48.summary()
```

[460]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.005
Model:                            OLS   Adj. R-squared:                 -0.012
Method:                 Least Squares   F-statistic:                    0.3188
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.728
Time:                        10:28:09   Log-Likelihood:                -1000.9
```

```
No. Observations:                 120   AIC:                             2008.
Df Residuals:                     117   BIC:                             2016.
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                              coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                  1400.0000   1026.778      1.363      0.175
-633.479    3433.479
race_grouping_white         189.3775   1033.600      0.183      0.855
-1857.613    2236.368
race_grouping_person_of_color    35.7284   1038.380      0.034      0.973
-2020.729    2092.186
==============================================================================
Omnibus:                       66.033   Durbin-Watson:                   1.921
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              218.590
Skew:                           2.092   Prob(JB):                     3.42e-48
Kurtosis:                       8.120   Cond. No.                         23.6
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[461]:
```
model49 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'base_pay_change ~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color')
result49 = model49.fit()
result49.summary()
```

[461]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.024
Model:                            OLS   Adj. R-squared:                 -0.001
Method:                 Least Squares   F-statistic:                    0.9677
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.411
Time:                        10:28:09   Log-Likelihood:                -999.70
No. Observations:                 120   AIC:                             2007.
Df Residuals:                     116   BIC:                             2019.
Df Model:                           3
Covariance Type:            nonrobust
================================================================================
```

```
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                       835.9007    683.945      1.222      0.224
-518.738    2190.540
gender_Female                   564.0993    346.551      1.628      0.106
-122.288    1250.486
gender_Male                     271.8013    364.288      0.746      0.457
-449.716     993.319
race_grouping_white             286.8101   1030.126      0.278      0.781
-1753.485    2327.105
race_grouping_person_of_color   195.1637   1038.272      0.188      0.851
-1861.266    2251.593
==============================================================================
Omnibus:                       62.985   Durbin-Watson:                   1.956
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              197.899
Skew:                           2.005   Prob(JB):                     1.06e-43
Kurtosis:                       7.847   Cond. No.                     4.19e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.41e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[462]:
```
new_reason_for_change_combined_regression = pd.DataFrame({'gender_Female':
 ↪[1,0,1,0], 'gender_Male': [0,1,0,1], 'race_grouping_white': [1,1,0,0],
 ↪'race_grouping_person_of_color': [0,0,1,1]})
new_reason_for_change_combined_regression['predicted'] = result49.
 ↪predict(new_reason_for_change_combined_regression)
new_reason_for_change_combined_regression
```

[462]:
```
   gender_Female  gender_Male  race_grouping_white  \
0              1            0                    1
1              0            1                    1
2              1            0                    0
3              0            1                    0

   race_grouping_person_of_color  predicted
0                              0    1686.81
1                              0    1394.51
2                              1    1595.16
3                              1    1302.87
```

[463]:
```
model50 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
↪'base_pay_change ~ gender_Female + gender_Male + age_group_5_25_under +␣
↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result50 = model50.fit()
result50.summary()
```

```
/Library/Frameworks/Python.framework/Versions/3.6/lib/python3.6/site-
packages/statsmodels/regression/linear_model.py:1755: RuntimeWarning: divide by
zero encountered in double_scalars
  return np.sqrt(eigvals[0]/eigvals[-1])
/Library/Frameworks/Python.framework/Versions/3.6/lib/python3.6/site-
packages/statsmodels/base/model.py:1294: RuntimeWarning: invalid value
encountered in true_divide
  return self.params / self.bse
/Library/Frameworks/Python.framework/Versions/3.6/lib/python3.6/site-
packages/scipy/stats/_distn_infrastructure.py:877: RuntimeWarning: invalid value
encountered in greater
  return (self.a < x) & (x < self.b)
/Library/Frameworks/Python.framework/Versions/3.6/lib/python3.6/site-
packages/scipy/stats/_distn_infrastructure.py:877: RuntimeWarning: invalid value
encountered in less
  return (self.a < x) & (x < self.b)
/Library/Frameworks/Python.framework/Versions/3.6/lib/python3.6/site-
packages/scipy/stats/_distn_infrastructure.py:1831: RuntimeWarning: invalid
value encountered in less_equal
  cond2 = cond0 & (x <= self.a)
```

[463]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.107
Model:                            OLS   Adj. R-squared:                  0.034
Method:                 Least Squares   F-statistic:                     1.463
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.171
Time:                        10:28:10   Log-Likelihood:                -994.40
No. Observations:                 120   AIC:                             2009.
Df Residuals:                     110   BIC:                             2037.
Df Model:                           9
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
```

```
--------
Intercept                950.6651     89.652     10.604      0.000     772.996
1128.334
gender_Female            634.1486    117.932      5.377      0.000     400.435
867.862
gender_Male              316.5165    127.637      2.480      0.015      63.570
569.463
age_group_5_25_under      48.4184    912.882      0.053      0.958   -1760.699
1857.536
age_group_5_25to29       253.1740    238.716      1.061      0.291    -219.905
726.253
age_group_5_30to34      -206.1156    256.682     -0.803      0.424    -714.800
302.568
age_group_5_35to39       477.0562    269.916      1.767      0.080     -57.855
1011.967
age_group_5_40to44       710.8937    356.966      1.991      0.049       3.470
1418.318
age_group_5_45to49      -108.7731    226.626     -0.480      0.632    -557.893
340.347
age_group_5_50to54      -185.8002    285.282     -0.651      0.516    -751.162
379.562
age_group_5_55to59       134.3662    400.874      0.335      0.738    -660.073
928.805
age_group_5_60to64      -172.5545    304.690     -0.566      0.572    -776.378
431.269
age_group_5_65_over             0          0        nan        nan           0
0
==============================================================================
Omnibus:                       49.406   Durbin-Watson:                   2.042
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              118.315
Skew:                           1.654   Prob(JB):                     2.03e-26
Kurtosis:                       6.566   Cond. No.                          inf
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is      0. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[464]:

```
model51 = sm.ols(data=merit_raises_combined_salaried_regression, formula =
 'base_pay_change ~ race_grouping_white + race_grouping_person_of_color +
 age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +
 age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
 age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
 age_group_5_65_over')
```

```
result51 = model51.fit()
result51.summary()
```

[464]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.103
Model:                            OLS   Adj. R-squared:                  0.021
Method:                 Least Squares   F-statistic:                     1.250
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.268
Time:                        10:28:10   Log-Likelihood:                -994.67
No. Observations:                 120   AIC:                             2011.
Df Residuals:                     109   BIC:                             2042.
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      1096.4061    936.124      1.171      0.244
-758.962    2951.774
race_grouping_white             412.0134   1036.127      0.398      0.692
-1641.556    2465.583
race_grouping_person_of_color   174.9337   1048.709      0.167      0.868
-1903.573    2253.441
age_group_5_25_under           -192.8195    921.509     -0.209      0.835
-2019.220    1633.581
age_group_5_25to29              303.5939    244.359      1.242      0.217
-180.717     787.905
age_group_5_30to34             -103.6335    272.182     -0.381      0.704
-643.090     435.823
age_group_5_35to39              445.2756    286.369      1.555      0.123
-122.299    1012.850
age_group_5_40to44              876.1929    361.933      2.421      0.017
158.854    1593.532
age_group_5_45to49              -52.8984    257.357     -0.206      0.838
-562.972     457.175
age_group_5_50to54             -127.9950    302.789     -0.423      0.673
-728.112     472.122
age_group_5_55to59              289.7871    405.978      0.714      0.477
-514.849    1094.423
age_group_5_60to64             -341.0970    314.230     -1.086      0.280
-963.891     281.697
age_group_5_65_over                    0          0        nan        nan
```

```
0           0
==============================================================================
Omnibus:                       51.129   Durbin-Watson:                   2.056
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              130.601
Skew:                           1.678   Prob(JB):                     4.37e-29
Kurtosis:                       6.855   Cond. No.                          inf
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is      0. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[465]:

```
model52 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'base_pay_change ~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result52 = model52.fit()
result52.summary()
```

[465]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.115
Model:                            OLS   Adj. R-squared:                  0.025
Method:                 Least Squares   F-statistic:                     1.273
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.250
Time:                        10:28:10   Log-Likelihood:                -993.87
No. Observations:                 120   AIC:                             2012.
Df Residuals:                     108   BIC:                             2045.
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                       687.2307    646.791      1.063      0.290
-594.822    1969.284
gender_Female                   485.3983    334.200      1.452      0.149
-177.044    1147.841
gender_Male                     201.8324    353.734      0.571      0.569
```

```
-499.329     902.994
race_grouping_white              486.8437    1035.835      0.470      0.639
-1566.362    2540.049
race_grouping_person_of_color    300.9616    1051.736      0.286      0.775
-1783.762    2385.685
age_group_5_25_under             -60.3067     924.108     -0.065      0.948
-1892.049    1771.436
age_group_5_25to29               227.3710     242.088      0.939      0.350
-252.488     707.230
age_group_5_30to34              -224.4915     270.950     -0.829      0.409
-761.561     312.578
age_group_5_35to39               494.6194     285.778      1.731      0.086
-71.842    1061.081
age_group_5_40to44               705.9406     370.014      1.908      0.059
-27.491    1439.372
age_group_5_45to49               -92.0339     246.733     -0.373      0.710
-581.102     397.034
age_group_5_50to54              -225.4246     297.524     -0.758      0.450
-815.169     364.319
age_group_5_55to59               121.6681     412.223      0.295      0.768
-695.430     938.766
age_group_5_60to64              -260.1117     320.639     -0.811      0.419
-895.673     375.450
age_group_5_65_over                    0            0        nan        nan
0            0
==============================================================================
Omnibus:                       47.823   Durbin-Watson:                   2.064
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              113.684
Skew:                           1.598   Prob(JB):                     2.06e-25
Kurtosis:                       6.540   Cond. No.                          inf
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is      0. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[466]:
```
model53 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
 ↪'performance_rating ~ gender_Female + gender_Male')
result53 = model53.fit()
result53.summary()
```

[466]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
```

```
Dep. Variable:     performance_rating   R-squared:                       0.006
Model:                            OLS   Adj. R-squared:                 -0.002
Method:                 Least Squares   F-statistic:                    0.7373
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.392
Time:                        10:28:10   Log-Likelihood:                -31.550
No. Observations:                 118   AIC:                             67.10
Df Residuals:                     116   BIC:                             72.64
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                   coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept         2.2810      0.020    114.520      0.000       2.242
2.320
gender_Female     1.1662      0.030     39.292      0.000       1.107
1.225
gender_Male       1.1148      0.033     33.572      0.000       1.049
1.181
==============================================================================
Omnibus:                        5.156   Durbin-Watson:                   1.775
Prob(Omnibus):                  0.076   Jarque-Bera (JB):                5.147
Skew:                           0.509   Prob(JB):                       0.0763
Kurtosis:                       2.899   Cond. No.                     8.49e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.5e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[467]:
```
model54 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
↪'performance_rating ~ race_grouping_white + race_grouping_person_of_color')
result54 = model54.fit()
result54.summary()
```

[467]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.001
Model:                            OLS   Adj. R-squared:                 -0.016
Method:                 Least Squares   F-statistic:                   0.07628
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.927
```

```
Time:                        10:28:10   Log-Likelihood:                -31.846
No. Observations:                 118   AIC:                             69.69
Df Residuals:                     115   BIC:                             78.00
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                 coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      3.4000      0.321     10.591      0.000
2.764       4.036
race_grouping_white            0.0351      0.323      0.109      0.914
-0.605       0.675
race_grouping_person_of_color     0.0116      0.325      0.036      0.971
-0.632       0.655
==============================================================================
Omnibus:                        5.821   Durbin-Watson:                   1.789
Prob(Omnibus):                  0.054   Jarque-Bera (JB):                5.895
Skew:                           0.544   Prob(JB):                       0.0525
Kurtosis:                       2.885   Cond. No.                         23.4
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[468]:

```
model55 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
↪'performance_rating ~ gender_Female + gender_Male + race_grouping_white +␣
↪race_grouping_person_of_color')
result55 = model55.fit()
result55.summary()
```

[468]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.007
Model:                            OLS   Adj. R-squared:                 -0.019
Method:                 Least Squares   F-statistic:                    0.2609
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.853
Time:                        10:28:10   Log-Likelihood:                -31.520
No. Observations:                 118   AIC:                             71.04
Df Residuals:                     114   BIC:                             82.12
Df Model:                           3
Covariance Type:            nonrobust
```

```
==============================================================================
=================
                              coef    std err          t      P>|t|
[0.025      0.975]
------------------------------------------------------------------------------
-----------------
Intercept                   2.2502      0.215     10.448      0.000
1.824       2.677
gender_Female               1.1498      0.109     10.532      0.000
0.934       1.366
gender_Male                 1.1005      0.115      9.577      0.000
0.873       1.328
race_grouping_white         0.0511      0.324      0.158      0.875
-0.591       0.694
race_grouping_person_of_color     0.0391      0.327      0.120      0.905
-0.609       0.687
==============================================================================
Omnibus:                    5.075   Durbin-Watson:                   1.776
Prob(Omnibus):              0.079   Jarque-Bera (JB):                5.057
Skew:                       0.505   Prob(JB):                       0.0798
Kurtosis:                   2.901   Cond. No.                     1.02e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.32e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[469]:
```
model56 = sm.ols(data=merit_raises_combined_salaried_regression, formula =
 ↪'performance_rating ~ gender_Female + gender_Male + age_group_5_25_under +
 ↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
 ↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
 ↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result56 = model56.fit()
result56.summary()
```

[469]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.120
Model:                            OLS   Adj. R-squared:                  0.046
Method:                 Least Squares   F-statistic:                     1.629
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.116
Time:                        10:28:10   Log-Likelihood:                -24.413
No. Observations:                 118   AIC:                             68.83
```

```
Df Residuals:                     108   BIC:                             96.53
Df Model:                           9
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept                2.1358      0.028     76.644      0.000       2.081
2.191
gender_Female            1.0716      0.037     28.823      0.000       0.998
1.145
gender_Male              1.0643      0.040     26.328      0.000       0.984
1.144
age_group_5_25_under     0.0999      0.283      0.353      0.725      -0.461
0.661
age_group_5_25to29       0.1698      0.075      2.260      0.026       0.021
0.319
age_group_5_30to34       0.1758      0.082      2.141      0.035       0.013
0.339
age_group_5_35to39       0.2692      0.084      3.205      0.002       0.103
0.436
age_group_5_40to44       0.2676      0.111      2.415      0.017       0.048
0.487
age_group_5_45to49       0.1212      0.070      1.724      0.088      -0.018
0.261
age_group_5_50to54       0.4327      0.088      4.891      0.000       0.257
0.608
age_group_5_55to59       0.4592      0.124      3.692      0.000       0.213
0.706
age_group_5_60to64       0.1404      0.095      1.481      0.141      -0.047
0.328
age_group_5_65_over           0          0        nan        nan           0
0
==============================================================================
Omnibus:                        8.372   Durbin-Watson:                   1.928
Prob(Omnibus):                  0.015   Jarque-Bera (JB):                8.098
Skew:                           0.609   Prob(JB):                       0.0174
Kurtosis:                       3.404   Cond. No.                          inf
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is      0. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
```

"""

[470]:
```
model57 = sm.ols(data=merit_raises_combined_salaried_regression, formula =␣
↪'performance_rating ~ race_grouping_white + race_grouping_person_of_color +␣
↪age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +␣
↪age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +␣
↪age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +␣
↪age_group_5_65_over')
result57 = model57.fit()
result57.summary()
```

[470]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.120
Model:                            OLS   Adj. R-squared:                  0.038
Method:                 Least Squares   F-statistic:                     1.463
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.163
Time:                        10:28:10   Log-Likelihood:                -24.362
No. Observations:                 118   AIC:                             70.72
Df Residuals:                     107   BIC:                             101.2
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         3.1237      0.290     10.780      0.000
2.549       3.698
race_grouping_white              -0.0231      0.321     -0.072      0.943
-0.659       0.613
race_grouping_person_of_color    -0.0434      0.325     -0.133      0.894
-0.688       0.601
age_group_5_25_under              0.1994      0.285      0.700      0.486
-0.365       0.764
age_group_5_25to29                0.2763      0.077      3.593      0.000
0.124       0.429
age_group_5_30to34                0.2889      0.086      3.367      0.001
0.119       0.459
age_group_5_35to39                0.3831      0.089      4.313      0.000
0.207       0.559
age_group_5_40to44                0.3820      0.112      3.411      0.001
0.160       0.604
age_group_5_45to49                0.2362      0.080      2.959      0.004
0.078       0.394
```

```
age_group_5_50to54                 0.5425      0.094      5.792      0.000
0.357       0.728
age_group_5_55to59                 0.5728      0.126      4.561      0.000
0.324       0.822
age_group_5_60to64                 0.2427      0.097      2.497      0.014
0.050       0.435
age_group_5_65_over                     0          0        nan        nan
0           0
==============================================================================
Omnibus:                        8.442   Durbin-Watson:                   1.937
Prob(Omnibus):                  0.015   Jarque-Bera (JB):                8.190
Skew:                           0.616   Prob(JB):                       0.0167
Kurtosis:                       3.387   Cond. No.                          inf
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is      0. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[471]:
```
model58 = sm.ols(data=merit_raises_combined_salaried_regression, formula =
 ↪'performance_rating ~ gender_Female + gender_Male + race_grouping_white +
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +
 ↪age_group_5_60to64 + age_group_5_65_over')
result58 = model58.fit()
result58.summary()
```

[471]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.120
Model:                            OLS   Adj. R-squared:                  0.029
Method:                 Least Squares   F-statistic:                     1.318
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.225
Time:                        10:28:11   Log-Likelihood:                -24.362
No. Observations:                 118   AIC:                             72.72
Df Residuals:                     106   BIC:                             106.0
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
```

```
--------------------------------------------------------------------------------
-----------------
Intercept                           2.1538      0.202     10.675      0.000
1.754       2.554
gender_Female                       1.0778      0.104     10.346      0.000
0.871       1.284
gender_Male                         1.0760      0.111      9.684      0.000
0.856       1.296
race_grouping_white                -0.0226      0.323     -0.070      0.944
-0.663       0.618
race_grouping_person_of_color      -0.0425      0.329     -0.129      0.897
-0.695       0.610
age_group_5_25_under                0.0927      0.288      0.322      0.748
-0.478       0.664
age_group_5_25to29                  0.1683      0.077      2.198      0.030
0.017       0.320
age_group_5_30to34                  0.1805      0.087      2.070      0.041
0.008       0.354
age_group_5_35to39                  0.2759      0.089      3.093      0.003
0.099       0.453
age_group_5_40to44                  0.2734      0.116      2.366      0.020
0.044       0.503
age_group_5_45to49                  0.1285      0.077      1.667      0.098
-0.024       0.281
age_group_5_50to54                  0.4344      0.093      4.687      0.000
0.251       0.618
age_group_5_55to59                  0.4643      0.129      3.609      0.000
0.209       0.719
age_group_5_60to64                  0.1358      0.100      1.353      0.179
-0.063       0.335
age_group_5_65_over                      0          0        nan        nan
0            0
==============================================================================
Omnibus:                        8.393   Durbin-Watson:                   1.936
Prob(Omnibus):                  0.015   Jarque-Bera (JB):                8.134
Skew:                           0.614   Prob(JB):                       0.0171
Kurtosis:                       3.385   Cond. No.                          inf
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is      0. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[472]:
```
commercial_hourly_regression =␣
↪commercial_hourly[['department','gender','race_ethnicity','current_base_pay','job_profile_c
commercial_hourly_regression = pd.get_dummies(commercial_hourly_regression,␣
↪columns=['gender','race_ethnicity','age_group_5','years_of_service_grouped','dept','desk','
```

[473]:
```
commercial_hourly_regression = commercial_hourly_regression.
↪rename(columns={'race_grouping_person of color':
↪'race_grouping_person_of_color','age_group_5_<25':
↪'age_group_5_25_under','age_group_5_25-29':
↪'age_group_5_25to29','age_group_5_30-34':
↪'age_group_5_30to34','age_group_5_35-39':
↪'age_group_5_35to39','age_group_5_40-44':
↪'age_group_5_40to44','age_group_5_45-49':
↪'age_group_5_45to49','age_group_5_50-54':
↪'age_group_5_50to54','age_group_5_55-59':
↪'age_group_5_55to59','age_group_5_60-64':
↪'age_group_5_60to64','age_group_5_65+':'age_group_5_65_over','tier_Tier 1':
↪'tier_Tier_1','tier_Tier 2':'tier_Tier_2','tier_Tier 3':
↪'tier_Tier_3','tier_Tier 4':'tier_Tier_4','years_of_service_grouped_0':
↪'years_of_service_grouped_0','years_of_service_grouped_1-2':
↪'years_of_service_grouped_1to2','years_of_service_grouped_3-5':
↪'years_of_service_grouped_3to5','years_of_service_grouped_6-10':
↪'years_of_service_grouped_6to10','years_of_service_grouped_11-15':
↪'years_of_service_grouped_11to15','years_of_service_grouped_16-20':
↪'years_of_service_grouped_16to20','years_of_service_grouped_21-25':
↪'years_of_service_grouped_21to25','years_of_service_grouped_25+':
↪'years_of_service_grouped_25_over'})
import statsmodels.formula.api as sm
model59 = sm.ols(data=commercial_hourly_regression, formula = 'current_base_pay␣
↪~ gender_Female + gender_Male')
result59 = model59.fit()
result59.summary()
```

[473]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.085
Model:                            OLS   Adj. R-squared:                  0.078
Method:                 Least Squares   F-statistic:                     13.41
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000350
Time:                        10:28:11   Log-Likelihood:                -482.21
No. Observations:                 147   AIC:                             968.4
Df Residuals:                     145   BIC:                             974.4
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
```

```
                    coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept        18.4963      0.356     51.935      0.000      17.792
19.200
gender_Female    11.2044      0.562     19.938      0.000      10.094
12.315
gender_Male       7.2918      0.564     12.923      0.000       6.177
8.407
==============================================================================
Omnibus:                       47.415   Durbin-Watson:                   1.170
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              107.307
Skew:                           1.371   Prob(JB):                     5.00e-24
Kurtosis:                       6.162   Cond. No.                     7.58e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 3.84e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[474]:
```
model60 = sm.ols(data=commercial_hourly_regression, formula = 'current_base_pay␣
 ↪~ race_grouping_white + race_grouping_person_of_color')
result60 = model60.fit()
result60.summary()
```

[474]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.105
Model:                            OLS   Adj. R-squared:                  0.093
Method:                 Least Squares   F-statistic:                     8.479
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000330
Time:                        10:28:11   Log-Likelihood:                -480.53
No. Observations:                 147   AIC:                             967.1
Df Residuals:                     144   BIC:                             976.0
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
```

```
Intercept                         22.1133      3.710      5.961      0.000
14.781      29.446
race_grouping_white                8.8969      3.837      2.319      0.022
1.313      16.481
race_grouping_person_of_color      4.4273      3.764      1.176      0.241
-3.013      11.868
==============================================================================
Omnibus:                       41.707   Durbin-Watson:                   1.138
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               82.415
Skew:                           1.270   Prob(JB):                     1.27e-18
Kurtosis:                       5.647   Cond. No.                         15.4
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
"""
```

[475]:
```
model61 = sm.ols(data=commercial_hourly_regression, formula = 'current_base_pay␣
 ↪~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color')
result61 = model61.fit()
result61.summary()
```

[475]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.182
Model:                            OLS   Adj. R-squared:                  0.165
Method:                 Least Squares   F-statistic:                     10.62
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           2.40e-06
Time:                        10:28:11   Log-Likelihood:                -473.93
No. Observations:                 147   AIC:                             955.9
Df Residuals:                     143   BIC:                             967.8
Df Model:                           3
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         15.9980      2.397      6.673      0.000
11.259      20.737
gender_Female                      9.8826      1.370      7.213      0.000
7.174      12.591
gender_Male                        6.1154      1.235      4.952      0.000
```

```
3.674       8.556
race_grouping_white              6.9695      3.719      1.874      0.063
-0.381      14.320
race_grouping_person_of_color    2.4877      3.650      0.682      0.497
-4.728       9.703
==============================================================================
Omnibus:                       39.108   Durbin-Watson:                   1.309
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               72.374
Skew:                           1.226   Prob(JB):                     1.92e-16
Kurtosis:                       5.410   Cond. No.                     6.49e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 7.26e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[476]:
```
new_commercial_hourly_regression = pd.DataFrame({'gender_Female': [1,0,1,0],␣
 ↪'gender_Male': [0,1,0,1], 'race_grouping_white': [1,1,0,0],␣
 ↪'race_grouping_person_of_color': [0,0,1,1], 'age': [40,40,40,40]})
new_commercial_hourly_regression['predicted'] = result61.
 ↪predict(new_commercial_hourly_regression)
new_commercial_hourly_regression
```

[476]:
```
   gender_Female  gender_Male  race_grouping_white  \
0              1            0                    1
1              0            1                    1
2              1            0                    0
3              0            1                    0

   race_grouping_person_of_color  age  predicted
0                              0   40      32.85
1                              0   40      29.08
2                              1   40      28.37
3                              1   40      24.60
```

[477]:
```
model62 = sm.ols(data=commercial_hourly_regression, formula = 'current_base_pay␣
 ↪~ gender_Female + gender_Male + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result62 = model62.fit()
result62.summary()
```

[477]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
```

```
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.173
Model:                            OLS   Adj. R-squared:                  0.113
Method:                 Least Squares   F-statistic:                     2.851
Date:                Wed, 06 Nov 2019   Prob (F-statistic):            0.00298
Time:                        10:28:11   Log-Likelihood:                -474.72
No. Observations:                 147   AIC:                             971.4
Df Residuals:                     136   BIC:                             1004.
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                           coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept               17.3253      0.339     51.121      0.000      16.655
17.995
gender_Female           10.5396      0.569     18.510      0.000       9.414
11.666
gender_Male              6.7857      0.568     11.943      0.000       5.662
7.909
age_group_5_25_under     0.1649      1.806      0.091      0.927      -3.407
3.737
age_group_5_25to29       3.3425      1.331      2.510      0.013       0.710
5.975
age_group_5_30to34       3.3398      1.985      1.683      0.095      -0.585
7.264
age_group_5_35to39       6.3753      1.673      3.811      0.000       3.067
9.683
age_group_5_40to44       1.1498      1.497      0.768      0.444      -1.810
4.109
age_group_5_45to49       2.7692      1.482      1.868      0.064      -0.162
5.701
age_group_5_50to54      -0.2028      1.454     -0.139      0.889      -3.078
2.672
age_group_5_55to59       0.7987      1.521      0.525      0.600      -2.210
3.807
age_group_5_60to64      -0.6104      1.669     -0.366      0.715      -3.910
2.690
age_group_5_65_over      0.1982      1.801      0.110      0.913      -3.364
3.760
==============================================================================
Omnibus:                       38.981   Durbin-Watson:                   1.332
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               78.932
Skew:                           1.170   Prob(JB):                     7.25e-18
Kurtosis:                       5.723   Cond. No.                     1.06e+16
```

```
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.11e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[478]:
```
model63 = sm.ols(data=commercial_hourly_regression, formula = 'current_base_pay␣
 ↪~ race_grouping_white + race_grouping_person_of_color + age_group_5_25_under␣
 ↪+ age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
 ↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
 ↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result63 = model63.fit()
result63.summary()
```

[478]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.204
Model:                            OLS   Adj. R-squared:                  0.139
Method:                 Least Squares   F-statistic:                     3.136
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000847
Time:                        10:28:11   Log-Likelihood:                -471.98
No. Observations:                 147   AIC:                             968.0
Df Residuals:                     135   BIC:                             1004.
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                        18.1569      3.366      5.395      0.000
11.501      24.813
race_grouping_white              10.8972      3.802      2.866      0.005
3.378      18.417
race_grouping_person_of_color     6.6583      3.758      1.772      0.079
-0.773      14.090
age_group_5_25_under             -0.7156      1.822     -0.393      0.695
-4.318       2.887
age_group_5_25to29                3.2103      1.348      2.382      0.019
0.545       5.875
age_group_5_30to34                4.6672      2.003      2.330      0.021
0.706       8.628
```

```
age_group_5_35to39                5.6706      1.664      3.408      0.001
2.380       8.962
age_group_5_40to44                2.9884      1.481      2.019      0.046
0.060       5.916
age_group_5_45to49                2.8627      1.518      1.886      0.061
-0.140       5.865
age_group_5_50to54               -0.8331      1.476     -0.564      0.573
-3.752       2.086
age_group_5_55to59                0.8815      1.550      0.569      0.570
-2.183       3.946
age_group_5_60to64               -0.2342      1.701     -0.138      0.891
-3.599       3.130
age_group_5_65_over              -0.3411      1.822     -0.187      0.852
-3.944       3.262
==============================================================================
Omnibus:                       34.622   Durbin-Watson:                   1.280
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               62.556
Skew:                           1.095   Prob(JB):                     2.61e-14
Kurtosis:                       5.328   Cond. No.                     8.18e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 3.72e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[479]:

```python
model64 = sm.ols(data=commercial_hourly_regression, formula = 'current_base_pay␣
 ↪~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result64 = model64.fit()
result64.summary()
```

[479]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:       current_base_pay   R-squared:                       0.263
Model:                            OLS   Adj. R-squared:                  0.196
Method:                 Least Squares   F-statistic:                     3.975
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           2.99e-05
Time:                        10:28:11   Log-Likelihood:                -466.32
No. Observations:                 147   AIC:                             958.6
Df Residuals:                     134   BIC:                             997.5
```

```
Df Model:                          12
Covariance Type:            nonrobust
================================================================================
=================
                                 coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                     13.7789      2.270      6.071      0.000
9.290      18.268
gender_Female                  8.6081      1.331      6.469      0.000
5.976      11.240
gender_Male                    5.1708      1.164      4.441      0.000
2.868       7.473
race_grouping_white            8.7881      3.728      2.357      0.020
1.414      16.162
race_grouping_person_of_color  4.5545      3.686      1.236      0.219
-2.735      11.844
age_group_5_25_under          -0.6527      1.749     -0.373      0.710
-4.113       2.807
age_group_5_25to29             2.2409      1.296      1.729      0.086
-0.323       4.805
age_group_5_30to34             3.6872      1.918      1.922      0.057
-0.107       7.481
age_group_5_35to39             5.5001      1.608      3.421      0.001
2.320       8.680
age_group_5_40to44             1.7499      1.436      1.219      0.225
-1.090       4.590
age_group_5_45to49             2.7592      1.450      1.903      0.059
-0.109       5.628
age_group_5_50to54            -0.6665      1.420     -0.469      0.640
-3.476       2.143
age_group_5_55to59             0.2605      1.474      0.177      0.860
-2.655       3.177
age_group_5_60to64            -0.5089      1.624     -0.313      0.754
-3.721       2.703
age_group_5_65_over           -0.5907      1.741     -0.339      0.735
-4.035       2.854
==============================================================================
Omnibus:                       29.883   Durbin-Watson:                   1.446
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               47.654
Skew:                           1.013   Prob(JB):                     4.49e-11
Kurtosis:                       4.917   Cond. No.                     1.31e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
```

```
specified.
[2] The smallest eigenvalue is 1.88e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[480]:
```
merit_raises_combined_hourly_regression =␣
↪merit_raises_combined[(merit_raises_combined['dept'] == 'Commercial') &␣
↪(merit_raises_combined['pay_rate_type'] == 'Hourly')]
merit_raises_combined_hourly_regression = pd.
↪get_dummies(merit_raises_combined_hourly_regression,␣
↪columns=['gender','race_grouping','age_group_5'])
```

[481]:
```
merit_raises_combined_hourly_regression =␣
↪merit_raises_combined_hourly_regression.
↪rename(columns={'race_grouping_person of color':
↪'race_grouping_person_of_color','age_group_5_<25':
↪'age_group_5_25_under','age_group_5_25-29':
↪'age_group_5_25to29','age_group_5_30-34':
↪'age_group_5_30to34','age_group_5_35-39':
↪'age_group_5_35to39','age_group_5_40-44':
↪'age_group_5_40to44','age_group_5_45-49':
↪'age_group_5_45to49','age_group_5_50-54':
↪'age_group_5_50to54','age_group_5_55-59':
↪'age_group_5_55to59','age_group_5_60-64':
↪'age_group_5_60to64','age_group_5_65+':'age_group_5_65_over'})
model65 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
↪'base_pay_change ~ gender_Female + gender_Male')
result65 = model65.fit()
result65.summary()
```

[481]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.064
Model:                            OLS   Adj. R-squared:                  0.060
Method:                 Least Squares   F-statistic:                     17.78
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           3.43e-05
Time:                        10:28:12   Log-Likelihood:                 35.988
No. Observations:                 262   AIC:                            -67.98
Df Residuals:                     260   BIC:                            -60.84
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                    coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
```

```
-
Intercept          0.2686      0.009     30.779      0.000       0.251
0.286
gender_Female      0.1895      0.014     13.893      0.000       0.163
0.216
gender_Male        0.0791      0.014      5.668      0.000       0.052
0.107
==============================================================================
Omnibus:                      112.425   Durbin-Watson:                   1.742
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              440.219
Skew:                           1.802   Prob(JB):                     2.56e-96
Kurtosis:                       8.229   Cond. No.                     1.09e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 3.34e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[482]:
```
model66 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
↪'base_pay_change ~ race_grouping_white + race_grouping_person_of_color')
result66 = model66.fit()
result66.summary()
```

[482]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.032
Model:                            OLS   Adj. R-squared:                  0.029
Method:                 Least Squares   F-statistic:                     8.727
Date:                Wed, 06 Nov 2019   Prob (F-statistic):            0.00342
Time:                        10:28:12   Log-Likelihood:                 31.648
No. Observations:                 262   AIC:                            -59.30
Df Residuals:                     260   BIC:                            -52.16
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         0.2835      0.010     28.425      0.000
0.264       0.303
race_grouping_white               0.1859      0.018     10.443      0.000
```

```
0.151       0.221
race_grouping_person_of_color     0.0976      0.013      7.264      0.000
0.071       0.124
==============================================================================
Omnibus:                      109.028   Durbin-Watson:                   1.787
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              384.134
Skew:                           1.791   Prob(JB):                     3.86e-84
Kurtosis:                       7.729   Cond. No.                     3.95e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.75e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[483]:
```
model67 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'base_pay_change ~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color')
result67 = model67.fit()
result67.summary()
```

[483]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.101
Model:                            OLS   Adj. R-squared:                  0.094
Method:                 Least Squares   F-statistic:                     14.58
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           9.99e-07
Time:                        10:28:12   Log-Likelihood:                 41.300
No. Observations:                 262   AIC:                            -76.60
Df Residuals:                     259   BIC:                            -65.90
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         0.2123      0.007     29.381      0.000
0.198       0.226
gender_Female                     0.1634      0.013     12.262      0.000
0.137       0.190
gender_Male                       0.0489      0.013      3.645      0.000
0.022       0.075
```

```
race_grouping_white              0.1535      0.016      9.340      0.000
0.121       0.186
race_grouping_person_of_color    0.0588      0.013      4.449      0.000
0.033       0.085
==============================================================================
Omnibus:                       98.490   Durbin-Watson:                   1.814
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              319.209
Skew:                           1.632   Prob(JB):                     4.84e-70
Kurtosis:                       7.311   Cond. No.                     1.38e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.94e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[484]:
```
new_reason_for_change_combined_regression = pd.DataFrame({'gender_Female':␣
 ↪[1,0,1,0], 'gender_Male': [0,1,0,1], 'race_grouping_white': [1,1,0,0],␣
 ↪'race_grouping_person_of_color': [0,0,1,1]})
new_reason_for_change_combined_regression['predicted'] = result67.
 ↪predict(new_reason_for_change_combined_regression)
new_reason_for_change_combined_regression
```

[484]:
```
   gender_Female  gender_Male  race_grouping_white  \
0              1            0                    1
1              0            1                    1
2              1            0                    0
3              0            1                    0

   race_grouping_person_of_color  predicted
0                              0       0.53
1                              0       0.41
2                              1       0.43
3                              1       0.32
```

[485]:
```
model68 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'base_pay_change ~ gender_Female + gender_Male + age_group_5_25_under +␣
 ↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
 ↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
 ↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result68 = model68.fit()
result68.summary()
```

[485]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
```

```
Dep. Variable:        base_pay_change   R-squared:                       0.127
Model:                            OLS   Adj. R-squared:                  0.092
Method:                 Least Squares   F-statistic:                     3.651
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000145
Time:                        10:28:12   Log-Likelihood:                 45.112
No. Observations:                 262   AIC:                            -68.22
Df Residuals:                     251   BIC:                            -28.97
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                          coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept               0.2639      0.009     27.788      0.000       0.245
0.283
gender_Female           0.1855      0.015     12.286      0.000       0.156
0.215
gender_Male             0.0784      0.015      5.216      0.000       0.049
0.108
age_group_5_25_under    0.1763      0.086      2.062      0.040       0.008
0.345
age_group_5_25to29     -0.0140      0.040     -0.354      0.724      -0.092
0.064
age_group_5_30to34      0.0412      0.048      0.853      0.395      -0.054
0.136
age_group_5_35to39      0.1336      0.043      3.111      0.002       0.049
0.218
age_group_5_40to44      0.0340      0.039      0.876      0.382      -0.042
0.110
age_group_5_45to49      0.0274      0.036      0.755      0.451      -0.044
0.099
age_group_5_50to54     -0.0362      0.035     -1.028      0.305      -0.105
0.033
age_group_5_55to59     -0.0117      0.034     -0.345      0.730      -0.079
0.055
age_group_5_60to64     -0.0325      0.036     -0.914      0.362      -0.102
0.037
age_group_5_65_over    -0.0542      0.041     -1.313      0.190      -0.135
0.027
==============================================================================
Omnibus:                      112.509   Durbin-Watson:                   1.803
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              472.182
Skew:                           1.770   Prob(JB):                    2.93e-103
Kurtosis:                       8.543   Cond. No.                     1.43e+16
==============================================================================
```

```
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.07e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[486]:
```
model69 = sm.ols(data=merit_raises_combined_hourly_regression, formula =
 ↪'base_pay_change ~ race_grouping_white + race_grouping_person_of_color +
 ↪age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +
 ↪age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
 ↪age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
 ↪age_group_5_65_over')
result69 = model69.fit()
result69.summary()
```

[486]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.106
Model:                            OLS   Adj. R-squared:                  0.070
Method:                 Least Squares   F-statistic:                     2.975
Date:                Wed, 06 Nov 2019   Prob (F-statistic):            0.00147
Time:                        10:28:12   Log-Likelihood:                 41.998
No. Observations:                 262   AIC:                            -62.00
Df Residuals:                     251   BIC:                            -22.74
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         0.2759      0.011     26.094      0.000
0.255       0.297
race_grouping_white               0.1811      0.018      9.892      0.000
0.145       0.217
race_grouping_person_of_color     0.0948      0.014      6.724      0.000
0.067       0.123
age_group_5_25_under              0.1520      0.086      1.764      0.079
-0.018       0.322
age_group_5_25to29               -0.0136      0.041     -0.334      0.738
-0.094       0.067
age_group_5_30to34                0.0793      0.048      1.640      0.102
-0.016       0.175
```

```
age_group_5_35to39                0.0950      0.043      2.196      0.029
0.010       0.180
age_group_5_40to44                0.0733      0.038      1.923      0.056
-0.002       0.148
age_group_5_45to49                0.0523      0.037      1.425      0.155
-0.020       0.125
age_group_5_50to54               -0.0371      0.036     -1.042      0.298
-0.107       0.033
age_group_5_55to59               -0.0010      0.034     -0.029      0.977
-0.069       0.067
age_group_5_60to64               -0.0415      0.036     -1.162      0.246
-0.112       0.029
age_group_5_65_over              -0.0828      0.041     -2.034      0.043
-0.163      -0.003
==============================================================================
Omnibus:                      113.194   Durbin-Watson:                   1.862
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              453.825
Skew:                           1.805   Prob(JB):                     2.84e-99
Kurtosis:                       8.343   Cond. No.                     9.13e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 5.49e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[487]:

```
model70 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'base_pay_change ~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result70 = model70.fit()
result70.summary()
```

[487]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:        base_pay_change   R-squared:                       0.162
Model:                            OLS   Adj. R-squared:                  0.126
Method:                 Least Squares   F-statistic:                     4.407
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           4.68e-06
Time:                        10:28:12   Log-Likelihood:                 50.540
No. Observations:                 262   AIC:                            -77.08
Df Residuals:                     250   BIC:                            -34.26
```

```
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                 coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                      0.2117      0.008     27.065      0.000
0.196       0.227
gender_Female                  0.1637      0.015     11.063      0.000
0.135       0.193
gender_Male                    0.0480      0.014      3.323      0.001
0.020       0.076
race_grouping_white            0.1548      0.017      9.067      0.000
0.121       0.188
race_grouping_person_of_color  0.0569      0.014      4.096      0.000
0.030       0.084
age_group_5_25_under           0.1807      0.084      2.154      0.032
0.015       0.346
age_group_5_25to29            -0.0568      0.041     -1.401      0.162
-0.137       0.023
age_group_5_30to34             0.0430      0.047      0.906      0.366
-0.050       0.136
age_group_5_35to39             0.1123      0.042      2.650      0.009
0.029       0.196
age_group_5_40to44             0.0289      0.038      0.757      0.450
-0.046       0.104
age_group_5_45to49             0.0324      0.036      0.904      0.367
-0.038       0.103
age_group_5_50to54            -0.0405      0.035     -1.171      0.243
-0.109       0.028
age_group_5_55to59            -0.0119      0.033     -0.356      0.722
-0.078       0.054
age_group_5_60to64            -0.0269      0.035     -0.766      0.444
-0.096       0.042
age_group_5_65_over           -0.0495      0.041     -1.217      0.225
-0.130       0.031
==============================================================================
Omnibus:                      103.112   Durbin-Watson:                   1.862
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              381.604
Skew:                           1.654   Prob(JB):                     1.37e-83
Kurtosis:                       7.900   Cond. No.                     2.58e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
```

```
specified.
[2] The smallest eigenvalue is 8.79e-31. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[488]:
```
model71 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'performance_rating ~ gender_Female + gender_Male')
result71 = model71.fit()
result71.summary()
```

[488]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.064
Model:                            OLS   Adj. R-squared:                  0.061
Method:                 Least Squares   F-statistic:                     17.83
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           3.34e-05
Time:                        10:28:12   Log-Likelihood:                -3.3094
No. Observations:                 261   AIC:                             10.62
Df Residuals:                     259   BIC:                             17.75
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=
                    coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
-
Intercept         2.1932      0.010    215.915      0.000       2.173
2.213
gender_Female     1.1609      0.016     73.044      0.000       1.130
1.192
gender_Male       1.0322      0.016     63.618      0.000       1.000
1.064
==============================================================================
Omnibus:                       16.892   Durbin-Watson:                   1.674
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               18.305
Skew:                           0.633   Prob(JB):                     0.000106
Kurtosis:                       3.288   Cond. No.                     2.38e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 6.93e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[489]:
```
model72 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
↪'performance_rating ~ race_grouping_white + race_grouping_person_of_color')
result72 = model72.fit()
result72.summary()
```

[489]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.009
Model:                            OLS   Adj. R-squared:                  0.005
Method:                 Least Squares   F-statistic:                     2.318
Date:                Wed, 06 Nov 2019   Prob (F-statistic):              0.129
Time:                        10:28:12   Log-Likelihood:                -10.836
No. Observations:                 261   AIC:                             25.67
Df Residuals:                     259   BIC:                             32.80
Df Model:                           1
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         2.2028      0.012    187.636      0.000
2.180       2.226
race_grouping_white               1.1282      0.021     53.858      0.000
1.087       1.169
race_grouping_person_of_color     1.0746      0.016     67.923      0.000
1.043       1.106
==============================================================================
Omnibus:                       13.746   Durbin-Watson:                   1.519
Prob(Omnibus):                  0.001   Jarque-Bera (JB):               14.917
Skew:                           0.585   Prob(JB):                     0.000577
Kurtosis:                       2.976   Cond. No.                     5.99e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.19e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[490]:
```
model73 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
↪'performance_rating ~ gender_Female + gender_Male + race_grouping_white +␣
↪race_grouping_person_of_color')
result73 = model73.fit()
```

```
result73.summary()
```

[490]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.076
Model:                            OLS   Adj. R-squared:                  0.069
Method:                 Least Squares   F-statistic:                     10.56
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           3.89e-05
Time:                        10:28:13   Log-Likelihood:                -1.7265
No. Observations:                 261   AIC:                             9.453
Df Residuals:                     258   BIC:                             20.15
Df Model:                           2
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                         1.6517      0.009    193.876      0.000
1.635       1.669
gender_Female                     0.8915      0.016     56.645      0.000
0.860       0.922
gender_Male                       0.7603      0.016     48.075      0.000
0.729       0.791
race_grouping_white               0.8561      0.019     44.198      0.000
0.818       0.894
race_grouping_person_of_color     0.7956      0.016     51.040      0.000
0.765       0.826
==============================================================================
Omnibus:                       17.639   Durbin-Watson:                   1.701
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               19.204
Skew:                           0.640   Prob(JB):                     6.76e-05
Kurtosis:                       3.356   Cond. No.                     3.19e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 5.46e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[491]:

```
model74 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
↪'performance_rating ~ gender_Female + gender_Male + age_group_5_25_under +␣
↪age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +␣
↪age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +␣
↪age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over')
result74 = model74.fit()
result74.summary()
```

[491]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.121
Model:                            OLS   Adj. R-squared:                  0.086
Method:                 Least Squares   F-statistic:                     3.439
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000303
Time:                        10:28:13   Log-Likelihood:                 4.8201
No. Observations:                 261   AIC:                             12.36
Df Residuals:                     250   BIC:                             51.57
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
========
                          coef    std err          t      P>|t|      [0.025
0.975]
--------------------------------------------------------------------------------
--------
Intercept               2.0534      0.011    185.289      0.000       2.032
2.075
gender_Female           1.0766      0.018     60.998      0.000       1.042
1.111
gender_Male             0.9768      0.018     55.653      0.000       0.942
1.011
age_group_5_25_under    0.1699      0.100      1.703      0.090      -0.027
0.366
age_group_5_25to29      0.2144      0.046      4.637      0.000       0.123
0.305
age_group_5_30to34      0.1876      0.056      3.330      0.001       0.077
0.299
age_group_5_35to39      0.2790      0.050      5.572      0.000       0.180
0.378
age_group_5_40to44      0.2975      0.045      6.572      0.000       0.208
0.387
age_group_5_45to49      0.1887      0.042      4.459      0.000       0.105
0.272
age_group_5_50to54      0.2140      0.041      5.215      0.000       0.133
0.295
```

```
age_group_5_55to59        0.2644       0.040       6.595       0.000        0.185
0.343
age_group_5_60to64        0.1640       0.041       3.958       0.000        0.082
0.246
age_group_5_65_over       0.0739       0.048       1.535       0.126       -0.021
0.169
==============================================================================
Omnibus:                       12.950   Durbin-Watson:                   1.720
Prob(Omnibus):                  0.002   Jarque-Bera (JB):               13.450
Skew:                           0.537   Prob(JB):                      0.00120
Kurtosis:                       3.285   Cond. No.                     1.01e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 4.15e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[492]:
```python
model75 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'performance_rating ~ race_grouping_white + race_grouping_person_of_color +␣
 ↪age_group_5_25_under + age_group_5_25to29 + age_group_5_30to34 +␣
 ↪age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +␣
 ↪age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +␣
 ↪age_group_5_65_over')
result75 = model75.fit()
result75.summary()
```

[492]:
```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.094
Model:                            OLS   Adj. R-squared:                  0.058
Method:                 Least Squares   F-statistic:                     2.601
Date:                Wed, 06 Nov 2019   Prob (F-statistic):            0.00509
Time:                        10:28:13   Log-Likelihood:                0.91884
No. Observations:                 261   AIC:                             20.16
Df Residuals:                     250   BIC:                             59.37
Df Model:                          10
Covariance Type:            nonrobust
================================================================================
=================
                                    coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
```

```
Intercept                          2.0590      0.012    166.409      0.000
2.035       2.083
race_grouping_white                1.0502      0.021     49.016      0.000
1.008       1.092
race_grouping_person_of_color      1.0088      0.017     61.107      0.000
0.976       1.041
age_group_5_25_under               0.1440      0.101      1.428      0.154
-0.055       0.342
age_group_5_25to29                 0.2284      0.048      4.798      0.000
0.135       0.322
age_group_5_30to34                 0.2191      0.057      3.872      0.000
0.108       0.331
age_group_5_35to39                 0.2498      0.051      4.934      0.000
0.150       0.350
age_group_5_40to44                 0.3326      0.045      7.460      0.000
0.245       0.420
age_group_5_45to49                 0.2070      0.043      4.816      0.000
0.122       0.292
age_group_5_50to54                 0.2125      0.042      5.100      0.000
0.130       0.295
age_group_5_55to59                 0.2703      0.041      6.634      0.000
0.190       0.351
age_group_5_60to64                 0.1514      0.042      3.619      0.000
0.069       0.234
age_group_5_65_over                0.0440      0.048      0.924      0.357
-0.050       0.138
==============================================================================
Omnibus:                        9.530   Durbin-Watson:                   1.609
Prob(Omnibus):                  0.009   Jarque-Bera (JB):                9.632
Skew:                           0.464   Prob(JB):                      0.00810
Kurtosis:                       3.151   Cond. No.                     6.30e+15
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 1.15e-29. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

[493]:

```
model76 = sm.ols(data=merit_raises_combined_hourly_regression, formula =␣
 ↪'performance_rating ~ gender_Female + gender_Male + race_grouping_white +␣
 ↪race_grouping_person_of_color + age_group_5_25_under + age_group_5_25to29 +␣
 ↪age_group_5_30to34 + age_group_5_35to39 + age_group_5_40to44 +␣
 ↪age_group_5_45to49 + age_group_5_50to54 + age_group_5_55to59 +␣
 ↪age_group_5_60to64 + age_group_5_65_over')
result76 = model76.fit()
```

```
result76.summary()
```

[493]:

```
<class 'statsmodels.iolib.summary.Summary'>
"""
                            OLS Regression Results
==============================================================================
Dep. Variable:     performance_rating   R-squared:                       0.128
Model:                            OLS   Adj. R-squared:                  0.090
Method:                 Least Squares   F-statistic:                     3.330
Date:                Wed, 06 Nov 2019   Prob (F-statistic):           0.000269
Time:                        10:28:13   Log-Likelihood:                 5.9135
No. Observations:                 261   AIC:                             12.17
Df Residuals:                     249   BIC:                             54.95
Df Model:                          11
Covariance Type:            nonrobust
================================================================================
=================
                                   coef    std err          t      P>|t|
[0.025      0.975]
--------------------------------------------------------------------------------
-----------------
Intercept                        1.5701      0.009    169.243      0.000
1.552       1.588
gender_Female                    0.8372      0.018     47.621      0.000
0.803       0.872
gender_Male                      0.7329      0.017     42.711      0.000
0.699       0.767
race_grouping_white              0.8109      0.020     40.043      0.000
0.771       0.851
race_grouping_person_of_color    0.7592      0.016     46.090      0.000
0.727       0.792
age_group_5_25_under             0.1266      0.099      1.273      0.204
-0.069       0.322
age_group_5_25to29               0.1463      0.048      3.046      0.003
0.052       0.241
age_group_5_30to34               0.1430      0.056      2.541      0.012
0.032       0.254
age_group_5_35to39               0.2222      0.050      4.421      0.000
0.123       0.321
age_group_5_40to44               0.2493      0.045      5.514      0.000
0.160       0.338
age_group_5_45to49               0.1458      0.042      3.433      0.001
0.062       0.229
age_group_5_50to54               0.1662      0.041      4.053      0.000
0.085       0.247
age_group_5_55to59               0.2185      0.040      5.448      0.000
0.139       0.297
```

```
age_group_5_60to64                0.1214      0.042      2.917      0.004
0.039       0.203
age_group_5_65_over               0.0308      0.048      0.639      0.524
-0.064       0.126
==============================================================================
Omnibus:                       13.454   Durbin-Watson:                   1.737
Prob(Omnibus):                  0.001   Jarque-Bera (JB):               14.029
Skew:                           0.544   Prob(JB):                     0.000899
Kurtosis:                       3.329   Cond. No.                     1.70e+16
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The smallest eigenvalue is 2.02e-30. This might indicate that there are
strong multicollinearity problems or that the design matrix is singular.
"""
```

Appendix B: Analysis in R

Washington Post Newspaper Guild Pay Study 2019

This is the study of Washington Post Guild members' salaries based on data turned over by management of The Washington Post on July 2, 2019, pursuant to a request by members of the Guild. Management turned over two Excel files: one file detailing the salaries of current guild members working for The Post (as of the date of transmission) and one file detailing the salaries of past guild members who worked for The Post and have left the organization in the past five years.

What follows is an attempt to understand pay at The Washington Post. No individual analysis should be taken on its own to mean that disparities in pay do or do not exist. This study will start with summary analysis of trends and will dive deeper as the study goes on.

The only data manipulation done prior to analysis was taking the data out of Excel and putting the files into CSV files, converting dates from 'MM/DD/YYYY' to 'YYYY-MM-DD' and removing commas from monetary columns where values exceeded 1,000.

Importing data

```
library(tidyverse)
library(dplyr)
library(lubridate)
library(data.table)
library(fastDummies)

df <- read_csv('csvs/active_wd.csv')
df2 <- read_csv('csvs/terminated_wd.csv')
```

Add fields for analysis

Add age field

```
data_date <- as.Date('2019-07-02')

df <- df %>% mutate(date_of_birth = ymd(date_of_birth),
                    age = floor(decimal_date(data_date) - decimal_date(date_of_birth)))

df2 <- df2 %>% mutate(date_of_birth = ymd(date_of_birth),
                    age = floor(decimal_date(data_date) - decimal_date(date_of_birth)))
```

Add years of service field

```
df <- df %>% mutate(hire_date = ymd(hire_date),
                    years_of_service = floor(decimal_date(data_date) - decimal_date(hire_date)))

df2 <- df2 %>% mutate(hire_date = ymd(hire_date),
                    years_of_service = floor(decimal_date(data_date) - decimal_date(hire_date)))
```

Add field for 5-year age groups

```
agebreaks5 <- c(0,25,30,35,40,45,50,55,60,65,100)
agelabels5 <- c('<25','25-29','30-34','35-39','40-44', '45-49','50-54','55-59','60-64','65+')

setDT(df)[, age_group_5 := cut(age,
                                breaks = agebreaks5,
                                right = FALSE,
                                labels = agelabels5)]

setDT(df2)[, age_group_5 := cut(age,
                                breaks = agebreaks5,
                                right = FALSE,
                                labels = agelabels5)]
```

Add field for 10-year age groups

```
agebreaks10 <- c(0,25,35,45,55,65,100)
agelabels10 <- c('<25','25-34','35-44','45-54','55-64','65+')

setDT(df)[, age_group_10 := cut(age,
                                breaks = agebreaks10,
                                right = FALSE,
                                labels = agelabels10)]

setDT(df2)[, age_group_10 := cut(age,
                                breaks = agebreaks10,
                                right = FALSE,
                                labels = agelabels10)]
```

Add field for years-of-service groups

```
yosbreaks <- c(0,1,3,6,11,16,21,26,100)
yoslabels <- c('0','1-2','3-5','6-10','11-15','16-20','21-25','25+')

setDT(df)[, years_of_service_grouped := cut(years_of_service,
                                breaks = yosbreaks,
                                right = FALSE,
                                labels = yoslabels)]

setDT(df2)[, years_of_service_grouped := cut(years_of_service,
                                breaks = yosbreaks,
                                right = FALSE,
                                labels = yoslabels)]
```

Group departments

```
df <- df %>%
    mutate(dept=case_when(
    department == 'News' ~ 'News',
    department == 'Editorial' ~ 'News',
    department == 'Client Solutions' ~ 'Commercial',
    department == 'Circulation' ~ 'Commercial',
```

```r
    department == 'Finance' ~ 'Commercial',
    department == 'Marketing' ~ 'Commercial',
    department == 'WP News Media Services' ~ 'Commercial',
    department == 'Production' ~ 'Commercial',
    department == 'Public Relations' ~ 'Commercial',
    department == 'Administration' ~ 'Commercial',
    department == 'Product'~ 'Commercial',
    TRUE ~ 'Other'))

df2 <- df2 %>%
    mutate(dept=case_when(
    department == 'News' ~ 'News',
    department == 'Editorial' ~ 'News',
    department == 'News Service and Syndicate' ~ 'News',
    department == 'Audience Development and Insights' ~ 'Commercial',
    department == 'Client Solutions' ~ 'Commercial',
    department == 'Customer Care and Logistics' ~ 'Commercial',
    department == 'Finance' ~ 'Commercial',
    department == 'Legal' ~ 'Commercial',
    department == 'Marketing' ~ 'Commercial',
    department == 'WP News Media Services' ~ 'Commercial',
    department == 'Production' ~ 'Commercial',
    department == 'Public Relations' ~ 'Commercial',
    department == 'Washington Post Live' ~ 'Commercial',
    department == 'Product' ~ 'Commercial',
    TRUE ~ 'Other'))
```

Group desks

```r
df <- df %>%
    mutate(desk=case_when(
    cost_center_current == '110000 News Operations' ~ 'Operations',
    cost_center_current == '110001 News Digital Operations' ~ 'Operations',
    cost_center_current == '110610 Audience Development and Engagement' ~ 'Audience Development and Enga
    cost_center_current == '110620 News Audio' ~ 'Audio',
    cost_center_current == '110604 Presentation Design' ~ 'Design',
    cost_center_current == '110605 Presentation' ~ 'Design',
    cost_center_current == '110664 News National Apps' ~ 'Emerging News Products',
    cost_center_current == '110665 News The Lily' ~ 'Emerging News Products',
    cost_center_current == '110666 News Snapchat' ~ 'Emerging News Products',
    cost_center_current == '110667 News By The Way' ~ 'Emerging News Products',
    cost_center_current == '113210 Economy and Business' ~ 'Financial',
    cost_center_current == '114000 Foreign Administration' ~ 'Foreign',
    cost_center_current == '114095 News Foreign Brazil' ~ 'Foreign',
    cost_center_current == '114100 Foreign Latam' ~ 'Foreign',
    cost_center_current == '114220 News Foreign Istanbul' ~ 'Foreign',
    cost_center_current == '114235 Foreign Western Europe' ~ 'Foreign',
    cost_center_current == '114300 News Foreign West Africa' ~ 'Foreign',
    cost_center_current == '114415 Foreign Hong Kong' ~ 'Foreign',
    cost_center_current == '114405 Foreign Beijing Bureau' ~ 'Foreign',
    cost_center_current == '114105 Foreign Mexico Bureau' ~ 'Foreign',
    cost_center_current == '114005 Foreign Beirut Bureau' ~ 'Foreign',
    cost_center_current == '114400 Foreign India Bureau' ~ 'Foreign',
```

```
    cost_center_current == '114410 Foreign Tokyo Bureau' ~ 'Foreign',
    cost_center_current == '114205 Foreign Islamabad Bureau' ~ 'Foreign',
    cost_center_current == '114305 Foreign Nairobi Bureau' ~ 'Foreign',
    cost_center_current == '114240 Foreign Rome Bureau' ~ 'Foreign',
    cost_center_current == '114200 Foreign London Bureau' ~ 'Foreign',
    cost_center_current == '114230 Foreign Moscow Bureau' ~ 'Foreign',
    cost_center_current == '114225 Foreign Cairo Bureau' ~ 'Foreign',
    cost_center_current == '114215 Foreign Berlin Bureau' ~ 'Foreign',
    cost_center_current == '110603 Presentation Graphics' ~ 'Graphics',
    cost_center_current == '110450 Investigative' ~ 'Investigative',
    cost_center_current == '112300 Local Politics and Government' ~ 'Local',
    cost_center_current == '110601 Multiplatform Desk' ~ 'Multiplatform',
    cost_center_current == '110500 Magazine' ~ 'National',
    cost_center_current == '113200 National Politics and Government' ~ 'National',
    cost_center_current == '113205 National Security' ~ 'National',
    cost_center_current == '113215 News National Health & Science' ~ 'National',
    cost_center_current == '113220 National Enterprise' ~ 'National',
    cost_center_current == '113235 National America' ~ 'National',
    cost_center_current == '113240 News National Environment' ~ 'National',
    cost_center_current == '110006 News Content & Research' ~ 'News Content and Research',
    cost_center_current == '110455 News Logistics' ~ 'News Logistics',
    cost_center_current == '110410 Book World' ~ 'Outlook',
    cost_center_current == '110460 Outlook' ~ 'Outlook',
    cost_center_current == '110475 Polling' ~ 'Polling',
    cost_center_current == '110015 Sports Main' ~ 'Sports',
    cost_center_current == '110300 Style' ~ 'Style',
    cost_center_current == '110435 Food' ~ 'Style',
    cost_center_current == '110485 Travel' ~ 'Style',
    cost_center_current == '110495 Local Living' ~ 'Style',
    cost_center_current == '110505 Weekend' ~ 'Style',
    cost_center_current == '110600 Universal Desk' ~ 'Universal Desk',
    cost_center_current == '110652 News Video - General' ~ 'Video',
    cost_center_current == '110663 Wake Up Report' ~ 'Other',
    cost_center_current == '115000 Editorial Administration' ~ 'Editorial',
    TRUE ~ 'non-newsroom'))

df2 <- df2 %>%
    mutate(desk=case_when(
    cost_center_current == '110000 News Operations' ~ 'Operations',
    cost_center_current == '110001 News Digital Operations' ~ 'Operations',
    cost_center_current == '110610 Audience Development and Engagement' ~ 'Audience Development and Enga
    cost_center_current == '110620 News Audio' ~ 'Audio',
    cost_center_current == '110604 Presentation Design' ~ 'Design',
    cost_center_current == '110605 Presentation' ~ 'Design',
    cost_center_current == '110664 News National Apps' ~ 'Emerging News Products',
    cost_center_current == '110665 News The Lily' ~ 'Emerging News Products',
    cost_center_current == '110666 News Snapchat' ~ 'Emerging News Products',
    cost_center_current == '110667 News By The Way' ~ 'Emerging News Products',
    cost_center_current == '113210 Economy and Business' ~ 'Financial',
    cost_center_current == '114000 Foreign Administration' ~ 'Foreign',
    cost_center_current == '114095 News Foreign Brazil' ~ 'Foreign',
    cost_center_current == '114100 Foreign Latam' ~ 'Foreign',
    cost_center_current == '114220 News Foreign Istanbul' ~ 'Foreign',
```

```
    cost_center_current == '114235 Foreign Western Europe' ~ 'Foreign',
    cost_center_current == '114300 News Foreign West Africa' ~ 'Foreign',
    cost_center_current == '114415 Foreign Hong Kong' ~ 'Foreign',
    cost_center_current == '114405 Foreign Beijing Bureau' ~ 'Foreign',
    cost_center_current == '114105 Foreign Mexico Bureau' ~ 'Foreign',
    cost_center_current == '114005 Foreign Beirut Bureau' ~ 'Foreign',
    cost_center_current == '114400 Foreign India Bureau' ~ 'Foreign',
    cost_center_current == '114410 Foreign Tokyo Bureau' ~ 'Foreign',
    cost_center_current == '114205 Foreign Islamabad Bureau' ~ 'Foreign',
    cost_center_current == '114305 Foreign Nairobi Bureau' ~ 'Foreign',
    cost_center_current == '114240 Foreign Rome Bureau' ~ 'Foreign',
    cost_center_current == '114200 Foreign London Bureau' ~ 'Foreign',
    cost_center_current == '114230 Foreign Moscow Bureau' ~ 'Foreign',
    cost_center_current == '114225 Foreign Cairo Bureau' ~ 'Foreign',
    cost_center_current == '114215 Foreign Berlin Bureau' ~ 'Foreign',
    cost_center_current == '110603 Presentation Graphics' ~ 'Graphics',
    cost_center_current == '110450 Investigative' ~ 'Investigative',
    cost_center_current == '112300 Local Politics and Government' ~ 'Local',
    cost_center_current == '110601 Multiplatform Desk' ~ 'Multiplatform',
    cost_center_current == '110500 Magazine' ~ 'National',
    cost_center_current == '113200 National Politics and Government' ~ 'National',
    cost_center_current == '113205 National Security' ~ 'National',
    cost_center_current == '113215 News National Health & Science' ~ 'National',
    cost_center_current == '113220 National Enterprise' ~ 'National',
    cost_center_current == '113235 National America' ~ 'National',
    cost_center_current == '113240 News National Environment' ~ 'National',
    cost_center_current == '110006 News Content & Research' ~ 'News Content and Research',
    cost_center_current == '110455 News Logistics' ~ 'News Logistics',
    cost_center_current == '110410 Book World' ~ 'Outlook',
    cost_center_current == '110460 Outlook' ~ 'Outlook',
    cost_center_current == '110475 Polling' ~ 'Polling',
    cost_center_current == '110015 Sports Main' ~ 'Sports',
    cost_center_current == '110300 Style' ~ 'Style',
    cost_center_current == '110435 Food' ~ 'Style',
    cost_center_current == '110485 Travel' ~ 'Style',
    cost_center_current == '110495 Local Living' ~ 'Style',
    cost_center_current == '110505 Weekend' ~ 'Style',
    cost_center_current == '110600 Universal Desk' ~ 'Universal Desk',
    cost_center_current == '110652 News Video - General' ~ 'Video',
    cost_center_current == '110663 Wake Up Report' ~ 'Other',
    cost_center_current == '115000 Editorial Administration' ~ 'Editorial',
    TRUE ~ 'non-newsroom'))
```

Group desks by median salary ranges

```
df <- df %>%
    mutate(tier=case_when(
    desk == 'National' ~ 'Tier 1',
    desk == 'Foreign' ~ 'Tier 1',
    desk == 'Financial' ~ 'Tier 1',
    desk == 'Investigative' ~ 'Tier 1',
    desk == 'Style' ~ 'Tier 2',
    desk == 'Local' ~ 'Tier 2',
```

```r
    desk == 'Graphics' ~ 'Tier 2',
    desk == 'Universal Desk' ~ 'Tier 2',
    desk == 'Sports' ~ 'Tier 2',
    desk == 'Outlook' ~ 'Tier 2',
    desk == 'Editorial' ~ 'Tier 2',
    desk == 'Audio' ~ 'Tier 3',
    desk == 'Polling' ~ 'Tier 3',
    desk == 'Design' ~ 'Tier 3',
    desk == 'Operations' ~ 'Tier 3',
    desk == 'Multiplatform' ~ 'Tier 3',
    desk == 'Video' ~ 'Tier 3',
    desk == 'Audience Development and Engagement' ~ 'Tier 3',
    desk == 'News Logistics' ~ 'Tier 4',
    desk == 'News Content and Research' ~ 'Tier 4',
    desk == 'Emerging News Products' ~ 'Tier 4',
    desk == 'Other' ~ 'Tier 4',
    TRUE ~ 'Other'))

df2 <- df2 %>%
    mutate(tier=case_when(
    desk == 'National' ~ 'Tier 1',
    desk == 'Foreign' ~ 'Tier 1',
    desk == 'Financial' ~ 'Tier 1',
    desk == 'Investigative' ~ 'Tier 1',
    desk == 'Style' ~ 'Tier 2',
    desk == 'Local' ~ 'Tier 2',
    desk == 'Graphics' ~ 'Tier 2',
    desk == 'Universal Desk' ~ 'Tier 2',
    desk == 'Sports' ~ 'Tier 2',
    desk == 'Outlook' ~ 'Tier 2',
    desk == 'Editorial' ~ 'Tier 2',
    desk == 'Audio' ~ 'Tier 3',
    desk == 'Polling' ~ 'Tier 3',
    desk == 'Design' ~ 'Tier 3',
    desk == 'Operations' ~ 'Tier 3',
    desk == 'Multiplatform' ~ 'Tier 3',
    desk == 'Video' ~ 'Tier 3',
    desk == 'Audience Development and Engagement' ~ 'Tier 3',
    desk == 'News Logistics' ~ 'Tier 4',
    desk == 'News Content and Research' ~ 'Tier 4',
    desk == 'Emerging News Products' ~ 'Tier 4',
    desk == 'Other' ~ 'Tier 4',
    TRUE ~ 'Other'))
```

Group race and ethnicity

```r
df <- df %>%
    mutate(race_grouping=case_when(
    race_ethnicity == 'White (United States of America)' ~ 'white',
    race_ethnicity == 'Black or African American (United States of America)' ~ 'person of color',
    race_ethnicity == 'Asian (United States of America)' ~ 'person of color',
    race_ethnicity == 'Hispanic or Latino (United States of America)' ~ 'person of color',
    race_ethnicity == 'Two or More Races (United States of America)' ~ 'person of color',
```

```
    race_ethnicity == 'American Indian or Alaska Native (United States of America)' ~ 'person of color'
    race_ethnicity == 'Native Hawaiian or Other Pacific Islander (United States of America)' ~ 'person o
    TRUE ~ 'unknown'))

df2 <- df2 %>%
    mutate(race_grouping=case_when(
    race_ethnicity == 'White (United States of America)' ~ 'white',
    race_ethnicity == 'Black or African American (United States of America)' ~ 'person of color',
    race_ethnicity == 'Asian (United States of America)' ~ 'person of color',
    race_ethnicity == 'Hispanic or Latino (United States of America)' ~ 'person of color',
    race_ethnicity == 'Two or More Races (United States of America)' ~ 'person of color',
    race_ethnicity == 'American Indian or Alaska Native (United States of America)' ~ 'person of color'
    race_ethnicity == 'Native Hawaiian or Other Pacific Islander (United States of America)' ~ 'person o
    TRUE ~ 'unknown'))
```

Employee pay change grouping

```
reason_for_change1 <- df[,c('business_process_reason1','base_pay_change1','effective_date1','pay_rate_ty
reason_for_change2 <- df[,c('business_process_reason2','base_pay_change2','effective_date2','pay_rate_ty
reason_for_change3 <- df[,c('business_process_reason3','base_pay_change3','effective_date3','pay_rate_ty
reason_for_change4 <- df[,c('business_process_reason4','base_pay_change4','effective_date4','pay_rate_ty
reason_for_change5 <- df[,c('business_process_reason5','base_pay_change5','effective_date5','pay_rate_ty
reason_for_change6 <- df[,c('business_process_reason6','base_pay_change6','effective_date6','pay_rate_ty
reason_for_change7 <- df[,c('business_process_reason7','base_pay_change7','effective_date7','pay_rate_ty
reason_for_change8 <- df[,c('business_process_reason8','base_pay_change8','effective_date8','pay_rate_ty
reason_for_change9 <- df[,c('business_process_reason9','base_pay_change9','effective_date9','pay_rate_ty
reason_for_change10 <- df[,c('business_process_reason10','base_pay_change10','effective_date10','pay_ra
reason_for_change11 <- df[,c('business_process_reason11','base_pay_change11','effective_date11','pay_ra
reason_for_change12 <- df[,c('business_process_reason12','base_pay_change12','effective_date12','pay_ra
reason_for_change13 <- df[,c('business_process_reason13','base_pay_change13','effective_date13','pay_ra
reason_for_change14 <- df[,c('business_process_reason14','base_pay_change14','effective_date14','pay_ra
reason_for_change15 <- df[,c('business_process_reason15','base_pay_change15','effective_date15','pay_ra
reason_for_change16 <- df[,c('business_process_reason16','base_pay_change16','effective_date16','pay_ra
reason_for_change17 <- df[,c('business_process_reason17','base_pay_change17','effective_date17','pay_ra
reason_for_change18 <- df[,c('business_process_reason18','base_pay_change18','effective_date18','pay_ra
reason_for_change19 <- df2[,c('business_process_reason1','base_pay_change1','effective_date1','pay_rate_
reason_for_change20 <- df2[,c('business_process_reason2','base_pay_change2','effective_date2','pay_rate_
reason_for_change21 <- df2[,c('business_process_reason3','base_pay_change3','effective_date3','pay_rate_
reason_for_change22 <- df2[,c('business_process_reason4','base_pay_change4','effective_date4','pay_rate_
reason_for_change23 <- df2[,c('business_process_reason5','base_pay_change5','effective_date5','pay_rate_
reason_for_change24 <- df2[,c('business_process_reason6','base_pay_change6','effective_date6','pay_rate_
reason_for_change25 <- df2[,c('business_process_reason7','base_pay_change7','effective_date7','pay_rate_
reason_for_change26 <- df2[,c('business_process_reason8','base_pay_change8','effective_date8','pay_rate_
reason_for_change27 <- df2[,c('business_process_reason9','base_pay_change9','effective_date9','pay_rate_
reason_for_change28 <- df2[,c('business_process_reason10','base_pay_change10','effective_date10','pay_ra
reason_for_change29 <- df2[,c('business_process_reason11','base_pay_change11','effective_date11','pay_ra
reason_for_change30 <- df2[,c('business_process_reason12','base_pay_change12','effective_date12','pay_ra
reason_for_change31 <- df2[,c('business_process_reason13','base_pay_change13','effective_date13','pay_ra

names(reason_for_change1) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
names(reason_for_change2) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
names(reason_for_change3) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
names(reason_for_change4) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
```

```r
names(reason_for_change5) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
names(reason_for_change6) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
names(reason_for_change7) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
names(reason_for_change8) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
names(reason_for_change9) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_ty
names(reason_for_change10) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change11) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change12) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change13) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change14) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change15) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change16) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change17) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change18) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change19) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change20) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change21) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change22) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change23) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change24) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change25) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change26) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change27) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change28) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change29) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change30) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_
names(reason_for_change31) <- c('business_process_reason','base_pay_change','effective_date','pay_rate_


reason_for_change_combined <- rbind(reason_for_change1,reason_for_change2,reason_for_change3,reason_for_
```

Employee performance evaluation grouping

```r
fifteen1 <- df[,c('2015_annual_performance_rating','gender','race_ethnicity','race_grouping','dept')]
fifteen2 <- df2[,c('2015_annual_performance_rating','gender','race_ethnicity','race_grouping','dept')]
sixteen1 <- df[,c('2016_annual_performance_rating','gender','race_ethnicity','race_grouping','dept')]
sixteen2 <- df2[,c('2016_annual_performance_rating','gender','race_ethnicity','race_grouping','dept')]
seventeen1 <- df[,c('2017_annual_performance_rating','gender','race_ethnicity','race_grouping','dept')]
seventeen2 <- df2[,c('2017_annual_performance_rating','gender','race_ethnicity','race_grouping','dept')]
eighteen1 <- df[,c('2018_annual_performance_rating','gender','race_ethnicity','race_grouping','dept')]
eighteen2 <- df2[,c('2018_annual_performance_rating','gender','race_ethnicity','race_grouping','dept')]

names(fifteen1) <- c('performance_rating','gender','race_ethnicity','race_grouping','dept')
names(fifteen2) <- c('performance_rating','gender','race_ethnicity','race_grouping','dept')
names(sixteen1) <- c('performance_rating','gender','race_ethnicity','race_grouping','dept')
names(sixteen2) <- c('performance_rating','gender','race_ethnicity','race_grouping','dept')
names(seventeen1) <- c('performance_rating','gender','race_ethnicity','race_grouping','dept')
names(seventeen2) <- c('performance_rating','gender','race_ethnicity','race_grouping','dept')
names(eighteen1) <- c('performance_rating','gender','race_ethnicity','race_grouping','dept')
names(eighteen2) <- c('performance_rating','gender','race_ethnicity','race_grouping','dept')

ratings_combined <- rbind(fifteen1,fifteen2,sixteen1,sixteen2,seventeen1,seventeen2,eighteen1,eighteen2)
```

Create departmental data frames

```
news_salaried <- filter(df, dept == 'News', pay_rate_type == 'Salaried')
news_hourly <- filter(df, dept == 'News', pay_rate_type == 'Hourly')
commercial_salaried <- filter(df, dept == 'Commercial', pay_rate_type == 'Salaried')
commercial_hourly <- filter(df, dept == 'Commercial', pay_rate_type == 'Hourly')

news_salaried2 <-  filter(df2, dept == 'News', pay_rate_type == 'Salaried')
news_hourly2 <-  filter(df2, dept == 'News', pay_rate_type == 'Hourly')
commercial_salaried2 <-  filter(df2, dept == 'Commercial', pay_rate_type == 'Salaried')
commercial_hourly2 <-  filter(df2, dept == 'Commercial', pay_rate_type == 'Hourly')
```

Supress Results

Suppress results where there are less than five employees

```
suppress <- function(results) {
  results <- filter(results, count >= 5)
  return(results)
}
```

Suppress results and order them by count of employees

```
suppress_count <- function(results) {
  results <- filter(results, count >= 5)
  results <- results[order(-results$count),]
  return(results)
}
```

Suppress results and order them by median salary of employees

```
suppress_median <- function(results) {
  results <- filter(results, count >= 5)
  results <- results[order(-results$median),]
  return(results)
}
```

Summary Analysis

Employee counts

```
current_employee_count = nrow(df)
terminated_employee_count = nrow(df2)

cat('Total employees in data:', current_employee_count + terminated_employee_count,'\n')
```

```
## Total employees in data: 1489
```

```
cat('Current employees:', current_employee_count,'\n')
```

```
## Current employees: 950
```

```
cat('Terminated employees:', terminated_employee_count,'\n')
```

```
## Terminated employees: 539
```

```r
current_salaried_employee_count <- nrow(filter(df,pay_rate_type == 'Salaried'))
terminated_salaried_employee_count <- nrow(filter(df2,pay_rate_type == 'Salaried'))

cat('Total salaried employees in data:', current_salaried_employee_count + terminated_salaried_employee_
```

```
## Total salaried employees in data: 989
```

```r
cat('Current salaried employees: ', current_salaried_employee_count,'\n')
```

```
## Current salaried employees:  707
```

```r
cat('Terminated salaried employees: ', terminated_salaried_employee_count,'\n')
```

```
## Terminated salaried employees:  282
```

```r
current_hourly_employee_count <- nrow(filter(df,pay_rate_type == 'Hourly'))
terminated_hourly_employee_count <- nrow(filter(df2,pay_rate_type == 'Hourly'))

cat('Total hourly employees in data: ',current_hourly_employee_count + terminated_hourly_employee_count
```

```
## Total hourly employees in data:  500
```

```r
cat('Current hourly employees: ',current_hourly_employee_count,'\n')
```

```
## Current hourly employees:  243
```

```r
cat('Terminated hourly employees: ',terminated_hourly_employee_count,'\n')
```

```
## Terminated hourly employees:  257
```

Salary information

```r
current_mean_salary = mean(df$current_base_pay[df$pay_rate_type == 'Salaried'])
cat('The mean yearly pay for current salaried employees is $',current_mean_salary,'\n')
```

```
## The mean yearly pay for current salaried employees is $ 112383
```

```r
current_median = median(df$current_base_pay[df$pay_rate_type == 'Salaried'])
cat('The median yearly pay for current salaried employees is $',current_median)
```

```
## The median yearly pay for current salaried employees is $ 99903.95
```

```r
current_mean_hourly <- mean(df$current_base_pay[df$pay_rate_type == 'Hourly'])
cat('The mean rate for current hourly employees at The Washington Post is $',current_mean_hourly,'\n')
```

```
## The mean rate for current hourly employees at The Washington Post is $ 30.19712
```

```r
current_median_hourly <- median(df$current_base_pay[df$pay_rate_type == 'Hourly'])
cat('The median rate for current hourly employees at The Washington Post is $',current_median_hourly)
```

```
## The median rate for current hourly employees at The Washington Post is $ 29.23
```

Employee gender

```r
current_employee_gender <- df %>% group_by(gender)
current_employee_gender <- current_employee_gender %>% summarise(
  count = length(current_base_pay)
)
suppress(current_employee_gender)
```

```
## # A tibble: 2 x 2
##   gender count
##   <chr>  <int>
## 1 Female   507
## 2 Male     443
```

```r
terminated_employee_gender <- df2 %>% group_by(gender)
terminated_employee_gender <- terminated_employee_gender %>% summarise(
  count = length(current_base_pay)
)
suppress(terminated_employee_gender)
```

```
## # A tibble: 2 x 2
##   gender count
##   <chr>  <int>
## 1 Female   293
## 2 Male     246
```

```r
current_median_gender <- filter(df, pay_rate_type == 'Salaried') %>% group_by(gender)
current_median_gender <- current_median_gender %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_gender)
```

```
## # A tibble: 2 x 3
##   gender count  median
##   <chr>  <int>   <dbl>
## 1 Female   370  91816.
## 2 Male     337 109928.
```

```r
current_median_hourly_gender <- filter(df, pay_rate_type == 'Hourly') %>% group_by(gender)
current_median_hourly_gender <- current_median_hourly_gender %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_hourly_gender)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female   137   30.8
## 2 Male     106   25.8
```

```r
current_age_gender_salaried <- filter(df, pay_rate_type == 'Salaried') %>% group_by(gender)
current_age_gender_salaried %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 2 x 2
##   gender median_age
##   <chr>       <dbl>
## 1 Female         35
## 2 Male           41
```

Employee race and ethnicity

```
current_employee_race_ethnicity <- df %>% group_by(race_ethnicity)
current_employee_race_ethnicity <- current_employee_race_ethnicity %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_employee_race_ethnicity)
```

```
## # A tibble: 7 x 2
##   race_ethnicity                                          count
##   <chr>                                                   <int>
## 1 White (United States of America)                          612
## 2 Black or African American (United States of America)    157
## 3 Asian (United States of America)                           77
## 4 Hispanic or Latino (United States of America)             45
## 5 <NA>                                                       22
## 6 Two or More Races (United States of America)              18
## 7 Prefer Not to Disclose (United States of America)         14
```

```
terminated_employee_race_ethnicity <- df2 %>% group_by(race_ethnicity)
terminated_employee_race_ethnicity <- terminated_employee_race_ethnicity %>% summarise(
  count = length(current_base_pay)
)
suppress_count(terminated_employee_race_ethnicity)
```

```
## # A tibble: 6 x 2
##   race_ethnicity                                          count
##   <chr>                                                   <int>
## 1 White (United States of America)                          291
## 2 Black or African American (United States of America)    162
## 3 Asian (United States of America)                           46
## 4 Hispanic or Latino (United States of America)             20
## 5 Two or More Races (United States of America)              11
## 6 Prefer Not to Disclose (United States of America)          7
```

```
current_median_race <- filter(df, pay_rate_type == 'Salaried') %>% group_by(race_ethnicity)
current_median_race <- current_median_race %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_median_race)
```

```
## # A tibble: 7 x 3
##   race_ethnicity                                          count  median
##   <chr>                                                   <int>   <dbl>
## 1 <NA>                                                       21 140000
## 2 White (United States of America)                          505 102880
## 3 Black or African American (United States of America)     62  91881.
## 4 Asian (United States of America)                           59  90780
## 5 Prefer Not to Disclose (United States of America)         10  82140
## 6 Hispanic or Latino (United States of America)             33  82000
## 7 Two or More Races (United States of America)              14  79860
```

```
current_median_hourly_race <- filter(df, pay_rate_type == 'Hourly') %>% group_by(race_ethnicity)
current_median_hourly_race <- current_median_hourly_race %>% summarise(
  count = length(current_base_pay),
```

```r
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_median_hourly_race)
```

```
## # A tibble: 4 x 3
##   race_ethnicity                                            count median
##   <chr>                                                     <int>  <dbl>
## 1 White (United States of America)                            107   32.7
## 2 Asian (United States of America)                             18   27.3
## 3 Hispanic or Latino (United States of America)                12   25.6
## 4 Black or African American (United States of America)         95   25.2
```

```r
current_age_race_salaried <- filter(df, pay_rate_type == 'Salaried') %>% group_by(race_ethnicity)
current_age_race_salaried %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 9 x 2
##   race_ethnicity                                                     median_age
##   <chr>                                                                   <dbl>
## 1 American Indian or Alaska Native (United States of America)             49.5
## 2 Asian (United States of America)                                        33
## 3 Black or African American (United States of America)                    41.5
## 4 Hispanic or Latino (United States of America)                           37
## 5 Native Hawaiian or Other Pacific Islander (United States of A~          43
## 6 Prefer Not to Disclose (United States of America)                       31.5
## 7 Two or More Races (United States of America)                            28
## 8 White (United States of America)                                        39
## 9 <NA>                                                                    36
```

```r
current_age_race_hourly <- filter(df, pay_rate_type == 'Hourly') %>% group_by(race_ethnicity)
current_age_race_hourly %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 8 x 2
##   race_ethnicity                                                  median_age
##   <chr>                                                                <dbl>
## 1 American Indian or Alaska Native (United States of America)          53.5
## 2 Asian (United States of America)                                     32
## 3 Black or African American (United States of America)                 47
## 4 Hispanic or Latino (United States of America)                        29.5
## 5 Prefer Not to Disclose (United States of America)                    30
## 6 Two or More Races (United States of America)                         26.5
## 7 White (United States of America)                                     39
## 8 <NA>                                                                 31
```

Employee gender x race/ethnicity

```r
current_employee_race_gender <- df %>% group_by(race_ethnicity, gender)
current_employee_race_gender <- current_employee_race_gender %>% summarise(
  count = length(current_base_pay)
)
suppress(current_employee_race_gender)
```

```
## # A tibble: 14 x 3
## # Groups:   race_ethnicity [7]
##    race_ethnicity                                     gender count
##    <chr>                                              <chr>  <int>
##  1 Asian (United States of America)                   Female    53
##  2 Asian (United States of America)                   Male      24
##  3 Black or African American (United States of America) Female    80
##  4 Black or African American (United States of America) Male      77
##  5 Hispanic or Latino (United States of America)      Female    24
##  6 Hispanic or Latino (United States of America)      Male      21
##  7 Prefer Not to Disclose (United States of America)  Female     6
##  8 Prefer Not to Disclose (United States of America)  Male       8
##  9 Two or More Races (United States of America)       Female    12
## 10 Two or More Races (United States of America)       Male       6
## 11 White (United States of America)                   Female   318
## 12 White (United States of America)                   Male     294
## 13 <NA>                                               Female    11
## 14 <NA>                                               Male      11
```

```r
current_salaried_race_gender <- filter(df, pay_rate_type == 'Salaried') %>% group_by(race_ethnicity, ge
current_salaried_race_gender <- current_salaried_race_gender %>% summarise(
  count = length(current_base_pay),
)
suppress(current_salaried_race_gender)
```

```
## # A tibble: 14 x 3
## # Groups:   race_ethnicity [7]
##    race_ethnicity                                     gender count
##    <chr>                                              <chr>  <int>
##  1 Asian (United States of America)                   Female    42
##  2 Asian (United States of America)                   Male      17
##  3 Black or African American (United States of America) Female    31
##  4 Black or African American (United States of America) Male      31
##  5 Hispanic or Latino (United States of America)      Female    16
##  6 Hispanic or Latino (United States of America)      Male      17
##  7 Prefer Not to Disclose (United States of America)  Female     5
##  8 Prefer Not to Disclose (United States of America)  Male       5
##  9 Two or More Races (United States of America)       Female     9
## 10 Two or More Races (United States of America)       Male       5
## 11 White (United States of America)                   Female   255
## 12 White (United States of America)                   Male     250
## 13 <NA>                                               Female    10
## 14 <NA>                                               Male      11
```

```r
current_hourly_race_gender <- filter(df, pay_rate_type == 'Hourly') %>% group_by(race_ethnicity, gender
current_hourly_race_gender <- current_hourly_race_gender %>% summarise(
  count = length(current_base_pay),
)
suppress(current_hourly_race_gender)
```

```
## # A tibble: 7 x 3
## # Groups:   race_ethnicity [4]
##   race_ethnicity                                     gender count
##   <chr>                                              <chr>  <int>
## 1 Asian (United States of America)                   Female    11
```

```
## 2 Asian (United States of America)                          Male       7
## 3 Black or African American (United States of America) Female    49
## 4 Black or African American (United States of America) Male      46
## 5 Hispanic or Latino (United States of America)         Female     8
## 6 White (United States of America)                      Female    63
## 7 White (United States of America)                      Male      44
```

```
current_median_race_gender <- filter(df, pay_rate_type == 'Salaried') %>% group_by(race_ethnicity, gende
current_median_race_gender <- current_median_race_gender %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_race_gender)
```

```
## # A tibble: 14 x 4
## # Groups:   race_ethnicity [7]
##    race_ethnicity                                         gender count median
##    <chr>                                                  <chr>  <int>  <dbl>
##  1 Asian (United States of America)                       Female    42 9.11e4
##  2 Asian (United States of America)                       Male      17 9.04e4
##  3 Black or African American (United States of America)   Female    31 8.78e4
##  4 Black or African American (United States of America)   Male      31 9.99e4
##  5 Hispanic or Latino (United States of America)          Female    16 8.02e4
##  6 Hispanic or Latino (United States of America)          Male      17 9.08e4
##  7 Prefer Not to Disclose (United States of America)      Female     5 7.30e4
##  8 Prefer Not to Disclose (United States of America)      Male       5 8.83e4
##  9 Two or More Races (United States of America)           Female     9 7.50e4
## 10 Two or More Races (United States of America)           Male       5 9.49e4
## 11 White (United States of America)                       Female   255 9.58e4
## 12 White (United States of America)                       Male     250 1.11e5
## 13 <NA>                                                   Female    10 1.38e5
## 14 <NA>                                                   Male      11 1.40e5
```

```
current_median_hourly_race_gender <- filter(df, pay_rate_type == 'Hourly') %>% group_by(race_ethnicity,
current_median_hourly_race_gender <- current_median_hourly_race_gender %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_hourly_race_gender)
```

```
## # A tibble: 7 x 4
## # Groups:   race_ethnicity [4]
##   race_ethnicity                                         gender count median
##   <chr>                                                  <chr>  <int>  <dbl>
## 1 Asian (United States of America)                       Female    11   28.3
## 2 Asian (United States of America)                       Male       7   26.3
## 3 Black or African American (United States of America) Female    49   26.8
## 4 Black or African American (United States of America) Male      46   23.2
## 5 Hispanic or Latino (United States of America)         Female     8   28.2
## 6 White (United States of America)                      Female    63   33.5
## 7 White (United States of America)                      Male      44   31.0
```

Employee age

```r
current_employee_age_5 <- df %>% group_by(age_group_5)
current_employee_age_5 <- current_employee_age_5 %>% summarise(
  count = length(current_base_pay)
)
suppress(current_employee_age_5)
```

```
## # A tibble: 10 x 2
##    age_group_5 count
##    <fct>       <int>
##  1 <25            59
##  2 25-29         171
##  3 30-34         139
##  4 35-39         125
##  5 40-44          98
##  6 45-49          79
##  7 50-54         106
##  8 55-59          84
##  9 60-64          56
## 10 65+            33
```

```r
terminated_employee_age_5 <- df2 %>% group_by(age_group_5)
terminated_employee_age_5 <- terminated_employee_age_5 %>% summarise(
  count = length(current_base_pay)
)
suppress(terminated_employee_age_5)
```

```
## # A tibble: 10 x 2
##    age_group_5 count
##    <fct>       <int>
##  1 <25             7
##  2 25-29         118
##  3 30-34         115
##  4 35-39          56
##  5 40-44          53
##  6 45-49          40
##  7 50-54          33
##  8 55-59          42
##  9 60-64          29
## 10 65+            44
```

```r
current_employee_age_10 <- df %>% group_by(age_group_10)
current_employee_age_10 <- current_employee_age_10 %>% summarise(
  count = length(current_base_pay)
)
suppress(current_employee_age_10)
```

```
## # A tibble: 6 x 2
##   age_group_10 count
##   <fct>        <int>
## 1 <25             59
## 2 25-34          310
## 3 35-44          223
## 4 45-54          185
## 5 55-64          140
## 6 65+             33
```

```r
terminated_employee_age_10 <- df2 %>% group_by(age_group_10)
terminated_employee_age_10 <- terminated_employee_age_10 %>% summarise(
  count = length(current_base_pay)
)
suppress(terminated_employee_age_10)
```

```
## # A tibble: 6 x 2
##   age_group_10 count
##   <fct>        <int>
## 1 <25              7
## 2 25-34          233
## 3 35-44          109
## 4 45-54           73
## 5 55-64           71
## 6 65+             44
```

```r
current_median_age_5 <- filter(df, pay_rate_type == 'Salaried') %>% group_by(age_group_5)
current_median_age_5 <- current_median_age_5 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_age_5)
```

```
## # A tibble: 10 x 3
##    age_group_5 count  median
##    <fct>       <int>   <dbl>
##  1 <25            34  64640
##  2 25-29         126  80000
##  3 30-34         119  92500
##  4 35-39         104 105301.
##  5 40-44          72 125924.
##  6 45-49          56  99502.
##  7 50-54          80 110845.
##  8 55-59          61 139717.
##  9 60-64          38 113134.
## 10 65+            17 153061
```

```r
current_median_hourly_age_5 <- filter(df, pay_rate_type == 'Hourly') %>% group_by(age_group_5)
current_median_hourly_age_5 <- current_median_hourly_age_5 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_hourly_age_5)
```

```
## # A tibble: 10 x 3
##    age_group_5 count median
##    <fct>       <int>  <dbl>
##  1 <25            25   25.6
##  2 25-29          45   30.8
##  3 30-34          20   30.6
##  4 35-39          21   31.2
##  5 40-44          26   29.5
##  6 45-49          23   31.3
##  7 50-54          26   27.2
##  8 55-59          23   27.0
```

```
##  9 60-64           18   25.0
## 10 65+             16   27.3
```

```
current_median_age_10 <- filter(df, pay_rate_type == 'Salaried') %>% group_by(age_group_10)
current_median_age_10 <- current_median_age_10 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_age_10)
```

```
## # A tibble: 6 x 3
##   age_group_10 count  median
##   <fct>        <int>   <dbl>
## 1 <25             34  64640
## 2 25-34          245  85500
## 3 35-44          176 115118.
## 4 45-54          136 108202.
## 5 55-64           99 127059.
## 6 65+             17 153061
```

```
current_median_hourly_age_10 <- filter(df, pay_rate_type == 'Hourly') %>% group_by(age_group_10)
current_median_hourly_age_10 <- current_median_hourly_age_10 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_hourly_age_10)
```

```
## # A tibble: 6 x 3
##   age_group_10 count median
##   <fct>        <int>  <dbl>
## 1 <25             25   25.6
## 2 25-34           65   30.8
## 3 35-44           47   30.8
## 4 45-54           49   28.3
## 5 55-64           41   26.5
## 6 65+             16   27.3
```

Employee department

```
current_employee_dept <- df %>% group_by(dept)
current_employee_dept <- current_employee_dept %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_employee_dept)
```

```
## # A tibble: 2 x 2
##   dept       count
##   <chr>      <int>
## 1 News         670
## 2 Commercial   280
```

```
current_employee_department <- df %>% group_by(department)
current_employee_department <- current_employee_department %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_employee_department)
```

```
## # A tibble: 9 x 2
##   department              count
##   <chr>                   <int>
## 1 News                      632
## 2 Client Solutions          164
## 3 Circulation                49
## 4 Editorial                  38
## 5 Finance                    31
## 6 Marketing                  11
## 7 WP News Media Services      9
## 8 Production                  6
## 9 Public Relations            5
```

```r
current_employee_dept_salary <- filter(df, pay_rate_type == 'Salaried') %>% group_by(dept)
current_employee_dept_salary <- current_employee_dept_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_employee_dept_salary)
```

```
## # A tibble: 2 x 3
##   dept       count  median
##   <chr>      <int>   <dbl>
## 1 News         574 104670.
## 2 Commercial   133  86105.
```

```r
current_employee_department_salary <- filter(df, pay_rate_type == 'Salaried') %>% group_by(department)
current_employee_department_salary <- current_employee_department_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_employee_department_salary)
```

```
## # A tibble: 7 x 3
##   department              count  median
##   <chr>                   <int>   <dbl>
## 1 Editorial                  33 105000
## 2 News                      541 104560.
## 3 Finance                     8  90576.
## 4 WP News Media Services      9  86105.
## 5 Client Solutions          102  85634.
## 6 Marketing                   7  81196.
## 7 Production                  5  71665.
```

```r
current_employee_dept_hourly <- filter(df, pay_rate_type == 'Hourly') %>% group_by(dept)
current_employee_dept_hourly <- current_employee_dept_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_employee_dept_hourly)
```

```
## # A tibble: 2 x 3
##   dept       count median
##   <chr>      <int>  <dbl>
## 1 News          96   33.0
## 2 Commercial   147   26.3
```

```r
current_employee_department_hourly <- filter(df, pay_rate_type == 'Hourly') %>% group_by(department)
current_employee_department_hourly <- current_employee_department_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_employee_department_hourly)
```

```
## # A tibble: 6 x 3
##   department       count median
##   <chr>            <int>  <dbl>
## 1 Public Relations     5   35.0
## 2 News                91   33.1
## 3 Editorial            5   32.3
## 4 Client Solutions    62   29.4
## 5 Finance             23   29.2
## 6 Circulation         49   22.4
```

Employee cost center

```r
current_employee_desk <- df %>% group_by(desk)
current_employee_desk <- current_employee_desk %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_employee_desk)
```

```
## # A tibble: 19 x 2
##    desk                                 count
##    <chr>                                <int>
##  1 non-newsroom                           280
##  2 National                               118
##  3 Local                                   70
##  4 Style                                   54
##  5 Video                                   50
##  6 Sports                                  48
##  7 Design                                  46
##  8 Multiplatform                           42
##  9 Editorial                               38
## 10 Financial                               38
## 11 Emerging News Products                  31
## 12 Foreign                                 27
## 13 Audience Development and Engagement     23
## 14 Universal Desk                          16
## 15 Graphics                                15
## 16 Audio                                   13
## 17 Investigative                           13
## 18 Operations                              13
## 19 Outlook                                  8
```

```r
current_employee_cost_center <- df %>% group_by(cost_center_current)
current_employee_cost_center <- current_employee_cost_center %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_employee_cost_center)
```

```
## # A tibble: 50 x 2
##    cost_center_current                                  count
##    <chr>                                                <int>
##  1 112300 Local Politics and Government                    70
##  2 113200 National Politics and Government                 63
##  3 110652 News Video - General                             50
##  4 110015 Sports Main                                      48
##  5 110601 Multiplatform Desk                               42
##  6 110300 Style                                            39
##  7 119065 Dispatch Operations (Night Circulation)          39
##  8 113210 Economy and Business                             38
##  9 115000 Editorial Administration                         38
## 10 110605 Presentation                                     24
## # ... with 40 more rows
```

```
current_employee_desk_salary <- filter(df, pay_rate_type == 'Salaried') %>% group_by(desk)
current_employee_desk_salary <- current_employee_desk_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_employee_desk_salary)
```

```
## # A tibble: 19 x 3
##    desk                                  count  median
##    <chr>                                 <int>   <dbl>
##  1 National                                106 149520.
##  2 Foreign                                  25 135000
##  3 Financial                                38 133510.
##  4 Investigative                            13 129780
##  5 Style                                    45 107171.
##  6 Local                                    65 105780
##  7 Editorial                                33 105000
##  8 Graphics                                 15 100780
##  9 Universal Desk                            8 100444.
## 10 Sports                                   37 100000
## 11 Outlook                                   6  99938.
## 12 Audio                                     7  92000
## 13 Design                                   45  88065.
## 14 Operations                                6  87890
## 15 non-newsroom                            133  86105.
## 16 Multiplatform                            26  86104
## 17 Video                                    46  84250
## 18 Audience Development and Engagement      16  83530
## 19 Emerging News Products                   30  75000
```

```
current_employee_cost_center_salary <- filter(df, pay_rate_type == 'Salaried') %>% group_by(cost_center_
current_employee_cost_center_salary <- current_employee_cost_center_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_employee_cost_center_salary)
```

```
## # A tibble: 35 x 3
##    cost_center_current                           count  median
##    <chr>                                         <int>   <dbl>
```

```
##  1 113205 National Security                   17 172780
##  2 117682 Global Sales                        21 164984.
##  3 113200 National Politics and Government    55 145980
##  4 113235 National America                    12 137124.
##  5 113215 News National Health & Science      12 135595.
##  6 113210 Economy and Business                38 133510.
##  7 110450 Investigative                       13 129780
##  8 117600 Leadership Executive                 5 127500
##  9 113240 News National Environment            5 126080
## 10 110300 Style                               36 115178.
## # ... with 25 more rows
```

```r
current_employee_desk_hourly <- filter(df, pay_rate_type == 'Hourly') %>% group_by(desk)
current_employee_desk_hourly <- current_employee_desk_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_employee_desk_hourly)
```

```
## # A tibble: 11 x 3
##    desk                                 count median
##    <chr>                                <int>  <dbl>
##  1 Audio                                    6   39.7
##  2 Universal Desk                           8   38.7
##  3 Audience Development and Engagement      7   37.6
##  4 Multiplatform                           16   34.1
##  5 Editorial                                5   32.3
##  6 National                                12   31.7
##  7 Local                                    5   26.5
##  8 non-newsroom                           147   26.3
##  9 Style                                    9   21.8
## 10 Sports                                  11   20.9
## 11 Operations                               7   15.6
```

```r
current_employee_cost_center_hourly <- filter(df, pay_rate_type == 'Hourly') %>% group_by(cost_center_cu
current_employee_cost_center_hourly <- current_employee_cost_center_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_employee_cost_center_hourly)
```

```
## # A tibble: 17 x 3
##    cost_center_current                              count median
##    <chr>                                            <int>  <dbl>
##  1 110620 News Audio                                    6   39.7
##  2 110600 Universal Desk                                8   38.7
##  3 110610 Audience Development and Engagement           7   37.6
##  4 129100 Community                                     5   35.0
##  5 110601 Multiplatform Desk                           16   34.1
##  6 115000 Editorial Administration                      5   32.3
##  7 126060 Circulation Accounting                        9   30.5
##  8 113200 National Politics and Government              8   30.5
##  9 126020 Revenue Administration                       14   28.8
## 10 117210 Production Creative                           5   28.1
## 11 112300 Local Politics and Government                 5   26.5
```

```
## 12 117310 Consumer to Consumer Team I                  5   24.7
## 13 117405 Jobs Tactical                                5   24.3
## 14 119065 Dispatch Operations (Night Circulation)    39   22.4
## 15 110015 Sports Main                                11   20.9
## 16 119026 Customer Contact Center                     5   20.5
## 17 110000 News Operations                             7   15.6
```

Employee years of service

```
current_employee_yos <- df %>% group_by(years_of_service_grouped)
current_employee_yos <- current_employee_yos %>% summarise(
  count = length(current_base_pay)
)
suppress(current_employee_yos)
```

```
## # A tibble: 8 x 2
##   years_of_service_grouped count
##   <fct>                    <int>
## 1 0                          138
## 2 1-2                        223
## 3 3-5                        195
## 4 6-10                       109
## 5 11-15                       80
## 6 16-20                      102
## 7 21-25                       46
## 8 25+                         57
```

```
terminated_employee_yos <- df2 %>% group_by(years_of_service_grouped)
terminated_employee_yos <- terminated_employee_yos %>% summarise(
  count = length(current_base_pay)
)
suppress(terminated_employee_yos)
```

```
## # A tibble: 8 x 2
##   years_of_service_grouped count
##   <fct>                    <int>
## 1 0                            8
## 2 1-2                         78
## 3 3-5                        197
## 4 6-10                       119
## 5 11-15                       52
## 6 16-20                       44
## 7 21-25                       12
## 8 25+                         29
```

```
current_employee_yos_salary <- filter(df, pay_rate_type == 'Salaried') %>% group_by(years_of_service_gr
current_employee_yos_salary <- current_employee_yos_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_employee_yos_salary)
```

```
## # A tibble: 8 x 3
##   years_of_service_grouped count  median
##   <fct>                    <int>   <dbl>
```

```
## 1 0                          96  85000
## 2 1-2                       164  91777.
## 3 3-5                       172  92306.
## 4 6-10                       75 106603.
## 5 11-15                      56 107685.
## 6 16-20                      74 125301.
## 7 21-25                      32 128485.
## 8 25+                        38 131793.
```

```
current_employee_yos_hourly <- filter(df, pay_rate_type == 'Hourly') %>% group_by(years_of_service_grou
current_employee_yos_hourly <- current_employee_yos_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_employee_yos_hourly)
```

```
## # A tibble: 8 x 3
##   years_of_service_grouped count median
##   <fct>                    <int>  <dbl>
## 1 0                           42   27.7
## 2 1-2                         59   31.7
## 3 3-5                         23   27.0
## 4 6-10                        34   29.2
## 5 11-15                       24   32.4
## 6 16-20                       28   27.8
## 7 21-25                       14   31.1
## 8 25+                         19   26.8
```

```
current_employee_yos_gender <- df %>% group_by(years_of_service_grouped, gender)
current_employee_yos_gender <- current_employee_yos_gender %>% summarise(
  count = length(current_base_pay)
)
suppress(current_employee_yos_gender)
```

```
## # A tibble: 16 x 3
## # Groups:   years_of_service_grouped [8]
##    years_of_service_grouped gender count
##    <fct>                    <chr>  <int>
##  1 0                        Female    82
##  2 0                        Male      56
##  3 1-2                      Female   132
##  4 1-2                      Male      91
##  5 3-5                      Female    96
##  6 3-5                      Male      99
##  7 6-10                     Female    51
##  8 6-10                     Male      58
##  9 11-15                    Female    41
## 10 11-15                    Male      39
## 11 16-20                    Female    48
## 12 16-20                    Male      54
## 13 21-25                    Female    25
## 14 21-25                    Male      21
## 15 25+                      Female    32
## 16 25+                      Male      25
```

```r
current_employee_yos_gender_salary <- filter(df, pay_rate_type == 'Salaried') %>% group_by(years_of_ser
current_employee_yos_gender_salary <- current_employee_yos_gender_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_employee_yos_gender_salary)
```

```
## # A tibble: 16 x 4
## # Groups:   years_of_service_grouped [8]
##    years_of_service_grouped gender count  median
##    <fct>                    <chr>  <int>   <dbl>
##  1 0                        Female    61  80000
##  2 0                        Male      35 100000
##  3 1-2                      Female    96  85780
##  4 1-2                      Male      68  96738.
##  5 3-5                      Female    88  89725.
##  6 3-5                      Male      84  95265.
##  7 6-10                     Female    38  99500.
##  8 6-10                     Male      37 117844.
##  9 11-15                    Female    28  98142.
## 10 11-15                    Male      28 126911.
## 11 16-20                    Female    31 121140
## 12 16-20                    Male      43 127059.
## 13 21-25                    Female    13 134780
## 14 21-25                    Male      19  99012.
## 15 25+                      Female    15 139831.
## 16 25+                      Male      23 127476.
```

```r
current_employee_yos_gender_hourly <- filter(df, pay_rate_type == 'Hourly') %>% group_by(years_of_servic
current_employee_yos_gender_hourly <- current_employee_yos_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_employee_yos_gender_hourly)
```

```
## # A tibble: 14 x 4
## # Groups:   years_of_service_grouped [8]
##    years_of_service_grouped gender count median
##    <fct>                    <chr>  <int>  <dbl>
##  1 0                        Female    21   29.2
##  2 0                        Male      21   22.0
##  3 1-2                      Female    36   31.9
##  4 1-2                      Male      23   26.0
##  5 3-5                      Female     8   34.8
##  6 3-5                      Male      15   23.0
##  7 6-10                     Female    13   30.8
##  8 6-10                     Male      21   25.2
##  9 11-15                    Female    13   34.7
## 10 11-15                    Male      11   29.9
## 11 16-20                    Female    17   25.1
## 12 16-20                    Male      11   30.2
## 13 21-25                    Female    12   30.3
## 14 25+                      Female    17   27.7
```

```r
current_employee_yos_race <- df %>% group_by(years_of_service_grouped, race_ethnicity)
current_employee_yos_race <- current_employee_yos_race %>% summarise(
  count = length(current_base_pay)
)
suppress(current_employee_yos_race)
```

```
## # A tibble: 31 x 3
## # Groups:   years_of_service_grouped [8]
##    years_of_service_group~ race_ethnicity                           count
##    <fct>                   <chr>                                    <int>
##  1 0                       Asian (United States of America)            15
##  2 0                       Black or African American (United States ~    20
##  3 0                       Hispanic or Latino (United States of Amer~    10
##  4 0                       Prefer Not to Disclose (United States of ~     8
##  5 0                       Two or More Races (United States of Ameri~     6
##  6 0                       White (United States of America)            77
##  7 1-2                     Asian (United States of America)            20
##  8 1-2                     Black or African American (United States ~    30
##  9 1-2                     Hispanic or Latino (United States of Amer~    12
## 10 1-2                     Two or More Races (United States of Ameri~     6
## # ... with 21 more rows
```

```r
current_employee_yos_race_salary <- filter(df, pay_rate_type == 'Salaried') %>% group_by(years_of_servi
current_employee_yos_race_salary <- current_employee_yos_race_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_employee_yos_race_salary)
```

```
## # A tibble: 25 x 4
## # Groups:   years_of_service_grouped [8]
##    years_of_service_gro~ race_ethnicity                        count median
##    <fct>                 <chr>                                 <int>  <dbl>
##  1 0                     Asian (United States of America)         11  77000
##  2 0                     Black or African American (United St~     5  87000
##  3 0                     Hispanic or Latino (United States of~     5  75000
##  4 0                     White (United States of America)         65  90000
##  5 1-2                   Asian (United States of America)         16  87780
##  6 1-2                   Black or African American (United St~    12  89780
##  7 1-2                   Hispanic or Latino (United States of~     7  82000
##  8 1-2                   Two or More Races (United States of ~     5  68000
##  9 1-2                   White (United States of America)        115  92780
## 10 1-2                   <NA>                                      5 140280
## # ... with 15 more rows
```

```r
current_employee_yos_race_hourly <- filter(df, pay_rate_type == 'Hourly') %>% group_by(years_of_service_
current_employee_yos_race_hourly <- current_employee_yos_race_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_employee_yos_race_hourly)
```

```
## # A tibble: 18 x 4
## # Groups:   years_of_service_grouped [8]
##    years_of_service_gro~ race_ethnicity                        count median
```

```
##    <fct>                   <chr>                              <int>  <dbl>
##   1 0                      Black or African American (United St~    15   25.6
##   2 0                      Hispanic or Latino (United States of~     5   28.2
##   3 0                      White (United States of America)         12   29.5
##   4 1-2                    Black or African American (United St~    18   25.8
##   5 1-2                    Hispanic or Latino (United States of~     5   21.8
##   6 1-2                    White (United States of America)         31   33.5
##   7 3-5                    Black or African American (United St~     6   21.8
##   8 3-5                    White (United States of America)         11   29.2
##   9 6-10                   Black or African American (United St~    15   24.4
##  10 6-10                   White (United States of America)         15   31.9
##  11 11-15                  Black or African American (United St~     8   30.2
##  12 11-15                  White (United States of America)         14   34.0
##  13 16-20                  Black or African American (United St~    13   24.0
##  14 16-20                  White (United States of America)         12   34.9
##  15 21-25                  Black or African American (United St~     9   29.7
##  16 21-25                  White (United States of America)          5   38.9
##  17 25+                    Black or African American (United St~    11   24.7
##  18 25+                    White (United States of America)          7   32.7
```

Employee performance evaluations

```
fifteen <- rbind(fifteen1,fifteen2)
fifteenrating_gender <- fifteen %>% group_by(gender)
fifteenrating_gender %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 2 x 2
##   gender median
##   <chr>   <dbl>
## 1 Female    3.4
## 2 Male      3.4
```

```
sixteen <- rbind(sixteen1,sixteen2)
sixteenrating_gender <- sixteen %>% group_by(gender)
sixteenrating_gender %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 2 x 2
##   gender median
##   <chr>   <dbl>
## 1 Female    3.3
## 2 Male      3.3
```

```
seventeen <- rbind(seventeen1,seventeen2)
seventeenrating_gender <- seventeen %>% group_by(gender)
seventeenrating_gender %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 2 x 2
##   gender median
##   <chr>   <dbl>
## 1 Female    3.4
```

```
## 2 Male      3.4
```

```r
eighteen <- rbind(eighteen1,eighteen2)
eighteenrating_gender <- eighteen %>% group_by(gender)
eighteenrating_gender %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 2 x 2
##   gender median
##   <chr>   <dbl>
## 1 Female    3.4
## 2 Male      3.4
```

```r
fifteen <- rbind(fifteen1,fifteen2)
fifteenrating_race_ethnicity <- fifteen %>% group_by(race_ethnicity)
fifteenrating_race_ethnicity %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 9 x 2
##   race_ethnicity                                                    median
##   <chr>                                                              <dbl>
## 1 American Indian or Alaska Native (United States of America)         3.5
## 2 Asian (United States of America)                                    3.4
## 3 Black or African American (United States of America)                3.2
## 4 Hispanic or Latino (United States of America)                       3.2
## 5 Native Hawaiian or Other Pacific Islander (United States of Ameri~   3.25
## 6 Prefer Not to Disclose (United States of America)                   3.3
## 7 Two or More Races (United States of America)                        3.3
## 8 White (United States of America)                                    3.4
## 9 <NA>                                                                3.7
```

```r
sixteen <- rbind(sixteen1,sixteen2)
sixteenrating_race_ethnicity <- sixteen %>% group_by(race_ethnicity)
sixteenrating_race_ethnicity %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 9 x 2
##   race_ethnicity                                                    median
##   <chr>                                                              <dbl>
## 1 American Indian or Alaska Native (United States of America)         3.25
## 2 Asian (United States of America)                                    3.35
## 3 Black or African American (United States of America)                3.2
## 4 Hispanic or Latino (United States of America)                       3.1
## 5 Native Hawaiian or Other Pacific Islander (United States of Ameri~   3.7
## 6 Prefer Not to Disclose (United States of America)                   3.3
## 7 Two or More Races (United States of America)                        3.2
## 8 White (United States of America)                                    3.4
## 9 <NA>                                                                3.75
```

```r
seventeen <- rbind(seventeen1,seventeen2)
seventeenrating_race_ethnicity <- seventeen %>% group_by(race_ethnicity)
seventeenrating_race_ethnicity %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 9 x 2
##   race_ethnicity                                                      median
##   <chr>                                                                <dbl>
## 1 American Indian or Alaska Native (United States of America)           3.55
## 2 Asian (United States of America)                                      3.4
## 3 Black or African American (United States of America)                  3.2
## 4 Hispanic or Latino (United States of America)                         3.3
## 5 Native Hawaiian or Other Pacific Islander (United States of Ameri~    3.5
## 6 Prefer Not to Disclose (United States of America)                     3.4
## 7 Two or More Races (United States of America)                          3.3
## 8 White (United States of America)                                      3.4
## 9 <NA>                                                                  3.6
```

```
eighteen <- rbind(eighteen1,eighteen2)
eighteenrating_race_ethnicity <- eighteen %>% group_by(race_ethnicity)
eighteenrating_race_ethnicity %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 9 x 2
##   race_ethnicity                                                      median
##   <chr>                                                                <dbl>
## 1 American Indian or Alaska Native (United States of America)           3.55
## 2 Asian (United States of America)                                      3.4
## 3 Black or African American (United States of America)                  3.3
## 4 Hispanic or Latino (United States of America)                         3.3
## 5 Native Hawaiian or Other Pacific Islander (United States of Ameri~    3.4
## 6 Prefer Not to Disclose (United States of America)                     3.35
## 7 Two or More Races (United States of America)                          3.3
## 8 White (United States of America)                                      3.5
## 9 <NA>                                                                  3.5
```

```
fifteen <- rbind(fifteen1,fifteen2)
fifteenrating_gender_race <- fifteen %>% group_by(race_ethnicity, gender)
fifteenrating_gender_race %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 18 x 3
## # Groups:   race_ethnicity [9]
##    race_ethnicity                                             gender median
##    <chr>                                                      <chr>   <dbl>
##  1 American Indian or Alaska Native (United States of Americ~ Female   3.5
##  2 American Indian or Alaska Native (United States of Americ~ Male     3.4
##  3 Asian (United States of America)                           Female   3.4
##  4 Asian (United States of America)                           Male     3.5
##  5 Black or African American (United States of America)      Female   3.2
##  6 Black or African American (United States of America)      Male     3
##  7 Hispanic or Latino (United States of America)              Female   3.3
##  8 Hispanic or Latino (United States of America)              Male     3.2
##  9 Native Hawaiian or Other Pacific Islander (United States ~ Female   3.2
## 10 Native Hawaiian or Other Pacific Islander (United States ~ Male     3.3
## 11 Prefer Not to Disclose (United States of America)          Female   3.3
## 12 Prefer Not to Disclose (United States of America)          Male    NA
## 13 Two or More Races (United States of America)               Female   3.3
## 14 Two or More Races (United States of America)               Male     2.75
```

```
## 15 White (United States of America)                              Female   3.4
## 16 White (United States of America)                              Male     3.5
## 17 <NA>                                                          Female   3.65
## 18 <NA>                                                          Male     3.8
```

```
sixteen <- rbind(sixteen1,sixteen2)
sixteenrating_gender_race <- sixteen %>% group_by(race_ethnicity, gender)
sixteenrating_gender_race %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 18 x 3
## # Groups:   race_ethnicity [9]
##    race_ethnicity                                                gender median
##    <chr>                                                         <chr>   <dbl>
##  1 American Indian or Alaska Native (United States of Americ~ Female   3.3
##  2 American Indian or Alaska Native (United States of Americ~ Male     3.2
##  3 Asian (United States of America)                              Female   3.4
##  4 Asian (United States of America)                              Male     3.3
##  5 Black or African American (United States of America)          Female   3.25
##  6 Black or African American (United States of America)          Male     3.15
##  7 Hispanic or Latino (United States of America)                 Female   3.15
##  8 Hispanic or Latino (United States of America)                 Male     3.1
##  9 Native Hawaiian or Other Pacific Islander (United States ~ Female   4.1
## 10 Native Hawaiian or Other Pacific Islander (United States ~ Male     3.3
## 11 Prefer Not to Disclose (United States of America)             Female   3.3
## 12 Prefer Not to Disclose (United States of America)             Male    NA
## 13 Two or More Races (United States of America)                  Female   3.2
## 14 Two or More Races (United States of America)                  Male     2.7
## 15 White (United States of America)                              Female   3.4
## 16 White (United States of America)                              Male     3.4
## 17 <NA>                                                          Female   3.8
## 18 <NA>                                                          Male     3.6
```

```
seventeen <- rbind(seventeen1,seventeen2)
seventeenrating_gender_race <- seventeen %>% group_by(race_ethnicity, gender)
seventeenrating_gender_race %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 18 x 3
## # Groups:   race_ethnicity [9]
##    race_ethnicity                                                gender median
##    <chr>                                                         <chr>   <dbl>
##  1 American Indian or Alaska Native (United States of Americ~ Female   3.7
##  2 American Indian or Alaska Native (United States of Americ~ Male     3.1
##  3 Asian (United States of America)                              Female   3.4
##  4 Asian (United States of America)                              Male     3.3
##  5 Black or African American (United States of America)          Female   3.2
##  6 Black or African American (United States of America)          Male     3.1
##  7 Hispanic or Latino (United States of America)                 Female   3.3
##  8 Hispanic or Latino (United States of America)                 Male     3.3
##  9 Native Hawaiian or Other Pacific Islander (United States ~ Female   4
## 10 Native Hawaiian or Other Pacific Islander (United States ~ Male     3
## 11 Prefer Not to Disclose (United States of America)             Female   3.5
## 12 Prefer Not to Disclose (United States of America)             Male     3.2
```

```
## 13 Two or More Races (United States of America)               Female   3.25
## 14 Two or More Races (United States of America)               Male     3.5
## 15 White (United States of America)                           Female   3.4
## 16 White (United States of America)                           Male     3.4
## 17 <NA>                                                       Female   3.65
## 18 <NA>                                                       Male     3.5
```

```
eighteen <- rbind(eighteen1,eighteen2)
eighteenrating_gender_race <- eighteen %>% group_by(race_ethnicity, gender)
eighteenrating_gender_race %>% summarise(
  median = median(performance_rating, na.rm = TRUE)
)
```

```
## # A tibble: 18 x 3
## # Groups:   race_ethnicity [9]
##    race_ethnicity                                                gender median
##    <chr>                                                         <chr>   <dbl>
##  1 American Indian or Alaska Native (United States of Americ~ Female   3.7
##  2 American Indian or Alaska Native (United States of Americ~ Male     3.2
##  3 Asian (United States of America)                           Female   3.4
##  4 Asian (United States of America)                           Male     3.4
##  5 Black or African American (United States of America)       Female   3.3
##  6 Black or African American (United States of America)       Male     3.3
##  7 Hispanic or Latino (United States of America)              Female   3.3
##  8 Hispanic or Latino (United States of America)              Male     3.3
##  9 Native Hawaiian or Other Pacific Islander (United States ~ Female  NA
## 10 Native Hawaiian or Other Pacific Islander (United States ~ Male     3.4
## 11 Prefer Not to Disclose (United States of America)          Female   3.55
## 12 Prefer Not to Disclose (United States of America)          Male     3.3
## 13 Two or More Races (United States of America)               Female   3.3
## 14 Two or More Races (United States of America)               Male     3.35
## 15 White (United States of America)                           Female   3.4
## 16 White (United States of America)                           Male     3.5
## 17 <NA>                                                       Female   3.6
## 18 <NA>                                                       Male     3.4
```

Employee pay changes

```
reason_for_change <- reason_for_change_combined %>% group_by(business_process_reason)
reason_for_change <- reason_for_change %>% summarise(
  count = length(business_process_reason)
)
suppress_count(reason_for_change)
```

```
## # A tibble: 19 x 2
##    business_process_reason                                              count
##    <chr>                                                                <int>
##  1 <NA>                                                                 16810
##  2 Request Compensation Change > Adjustment > Contract Increase          2451
##  3 Merit > Performance > Annual Performance Appraisal                    1729
##  4 Data Change > Data Change > Change Job Details                         673
##  5 Transfer > Transfer > Move to another Manager                          533
##  6 Request Compensation Change > Adjustment > Change Plan Assignment      435
##  7 Request Compensation Change > Adjustment > Market Adjustment           384
##  8 Promotion > Promotion > Promotion                                      359
```

```
##  9 Hire Employee > New Hire > Fill Vacancy                             253
## 10 Hire Employee > New Hire > New Position                             189
## 11 Request Compensation Change > Adjustment > Increased Job Responsi~    72
## 12 Request Compensation Change > Adjustment > Job Change                60
## 13 Transfer > Transfer > Transfer between departments                   54
## 14 Request Compensation Change > Adjustment > Performance               38
## 15 Transfer > Transfer > Transfer between companies                     21
## 16 Hire Employee > Rehire > Fill Vacancy                                16
## 17 Hire Employee > New Hire > Convert Contingent                        12
## 18 Hire Employee > New Hire > Conversion                                11
## 19 Hire Employee > Rehire > New Position                                 7
```

```
reason_for_change_gender <- reason_for_change_combined %>% group_by(business_process_reason, gender)
reason_for_change_gender <- reason_for_change_gender %>% summarise(
  count = length(business_process_reason)
)
suppress_count(reason_for_change_gender)
```

```
## # A tibble: 34 x 3
## # Groups:   business_process_reason [19]
##    business_process_reason                                     gender count
##    <chr>                                                       <chr>  <int>
##  1 <NA>                                                        Female  9012
##  2 <NA>                                                        Male    7798
##  3 Request Compensation Change > Adjustment > Contract Increa~ Female  1284
##  4 Request Compensation Change > Adjustment > Contract Increa~ Male    1167
##  5 Merit > Performance > Annual Performance Appraisal          Female   878
##  6 Merit > Performance > Annual Performance Appraisal          Male     851
##  7 Data Change > Data Change > Change Job Details              Female   367
##  8 Data Change > Data Change > Change Job Details              Male     306
##  9 Transfer > Transfer > Move to another Manager               Male     299
## 10 Request Compensation Change > Adjustment > Change Plan Ass~ Female   288
## # ... with 24 more rows
```

```
reason_for_change_race <- reason_for_change_combined %>% group_by(business_process_reason, race_ethnici
reason_for_change_race <- reason_for_change_race %>% summarise(
  count = length(business_process_reason)
)
suppress_count(reason_for_change_race)
```

```
## # A tibble: 83 x 3
## # Groups:   business_process_reason [18]
##    business_process_reason             race_ethnicity                 count
##    <chr>                               <chr>                          <int>
##  1 <NA>                                White (United States of Ameri~ 10227
##  2 <NA>                                Black or African American (Un~  3507
##  3 Request Compensation Change > Adju~ White (United States of Ameri~  1556
##  4 <NA>                                Asian (United States of Ameri~  1366
##  5 Merit > Performance > Annual Perfo~ White (United States of Ameri~  1109
##  6 <NA>                                Hispanic or Latino (United St~   756
##  7 Request Compensation Change > Adju~ Black or African American (Un~   508
##  8 Data Change > Data Change > Change~ White (United States of Ameri~   432
##  9 <NA>                                Two or More Races (United Sta~   382
## 10 Merit > Performance > Annual Perfo~ Black or African American (Un~   347
## # ... with 73 more rows
```

```r
reason_for_change_race_gender <- reason_for_change_combined %>% group_by(business_process_reason, race_e
reason_for_change_race_gender <- reason_for_change_race_gender %>% summarise(
  count = length(business_process_reason)
)
suppress_count(reason_for_change_race_gender)
```

```
## # A tibble: 122 x 4
## # Groups:   business_process_reason, race_ethnicity [70]
##    business_process_reason          race_ethnicity             gender count
##    <chr>                            <chr>                      <chr>  <int>
##  1 <NA>                             White (United States of A~ Female  5391
##  2 <NA>                             White (United States of A~ Male    4836
##  3 <NA>                             Black or African American~ Male    1827
##  4 <NA>                             Black or African American~ Female  1680
##  5 <NA>                             Asian (United States of A~ Female  1022
##  6 Request Compensation Change > A~ White (United States of A~ Female   794
##  7 Request Compensation Change > A~ White (United States of A~ Male     762
##  8 Merit > Performance > Annual Pe~ White (United States of A~ Male     564
##  9 Merit > Performance > Annual Pe~ White (United States of A~ Female   545
## 10 <NA>                             Hispanic or Latino (Unite~ Female   414
## # ... with 112 more rows
```

News

Gender

```r
current_news_gender_salaried <- news_salaried %>% group_by(gender)
current_news_gender_salaried <- current_news_gender_salaried %>% summarise(
  count = length(current_base_pay)
)
suppress(current_news_gender_salaried)
```

```
## # A tibble: 2 x 2
##   gender count
##   <chr>  <int>
## 1 Female   284
## 2 Male     290
```

```r
current_news_gender_hourly <- news_hourly %>% group_by(gender)
current_news_gender_hourly <- current_news_gender_hourly %>% summarise(
  count = length(current_base_pay)
)
suppress(current_news_gender_hourly)
```

```
## # A tibble: 2 x 2
##   gender count
##   <chr>  <int>
## 1 Female    63
## 2 Male      33
```

```r
current_news_gender_salaried_median <- news_salaried %>% group_by(gender)
current_news_gender_salaried_median <- current_news_gender_salaried_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
```

```r
suppress(current_news_gender_salaried_median)
```

```
## # A tibble: 2 x 3
##   gender count  median
##   <chr>  <int>   <dbl>
## 1 Female   284  95595.
## 2 Male     290 116065.
```

```r
current_news_gender_hourly_median <- news_hourly %>% group_by(gender)
current_news_gender_hourly_median <- current_news_gender_hourly_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_hourly_median)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    63   32.8
## 2 Male      33   33.3
```

```r
current_news_gender_age_salaried <- news_salaried %>% group_by(gender)
current_news_gender_age_salaried %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 2 x 2
##   gender median_age
##   <chr>       <dbl>
## 1 Female         35
## 2 Male           41
```

```r
current_news_gender_age_hourly <- news_hourly %>% group_by(gender)
current_news_gender_age_hourly %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 2 x 2
##   gender median_age
##   <chr>       <dbl>
## 1 Female         31
## 2 Male           36
```

```r
current_news_gender_age_5_salary <- news_salaried %>% group_by(age_group_5, gender)
current_news_gender_age_5_salary <- current_news_gender_age_5_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_age_5_salary)
```

```
## # A tibble: 20 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 gender count  median
##    <fct>       <chr>  <int>   <dbl>
##  1 <25         Female    19  64280
##  2 <25         Male       5  72000
##  3 25-29       Female    60  80000
```

```
##   4 25-29       Male      31  85500
##   5 30-34       Female    57  87000
##   6 30-34       Male      46  97828.
##   7 35-39       Female    38  98892.
##   8 35-39       Male      48 116030
##   9 40-44       Female    22 133200.
##  10 40-44       Male      41 125000
##  11 45-49       Female    20 117295.
##  12 45-49       Male      23  99725
##  13 50-54       Female    29 108864.
##  14 50-54       Male      41 126280.
##  15 55-59       Female    22 145655.
##  16 55-59       Male      29 147780
##  17 60-64       Female    12 129325.
##  18 60-64       Male      16 131217.
##  19 65+         Female     5 157095.
##  20 65+         Male      10 156260.
```

```
current_news_gender_age_5_hourly <- news_hourly %>% group_by(age_group_5, gender)
current_news_gender_age_5_hourly <- current_news_gender_age_5_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_age_5_hourly)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_5 [8]
##   age_group_5 gender count median
##   <fct>       <chr>  <int>  <dbl>
## 1 <25         Female    12   31.4
## 2 25-29       Female    17   31.2
## 3 25-29       Male       6   21.0
## 4 30-34       Male       7   33.7
## 5 35-39       Female     5   31.9
## 6 40-44       Female     5   41.4
## 7 45-49       Female     5   44.5
## 8 50-54       Female     6   40.2
## 9 55-59       Male       5   34.9
```

```
current_news_gender_age_10_salary <- news_salaried %>% group_by(age_group_10, gender)
current_news_gender_age_10_salary <- current_news_gender_age_10_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_age_10_salary)
```

```
## # A tibble: 12 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 gender count  median
##    <fct>        <chr>  <int>   <dbl>
##  1 <25          Female    19  64280
##  2 <25          Male       5  72000
##  3 25-34        Female   117  83147.
##  4 25-34        Male      77  92500
##  5 35-44        Female    60 105691.
```

```
##  6 35-44        Male      89 118785
##  7 45-54        Female    49 108864.
##  8 45-54        Male      64 117982.
##  9 55-64        Female    34 140424.
## 10 55-64        Male      45 146542.
## 11 65+          Female     5 157095.
## 12 65+          Male      10 156260.
```

```
current_news_gender_age_10_hourly <- news_hourly %>% group_by(age_group_10, gender)
current_news_gender_age_10_hourly <- current_news_gender_age_10_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_age_10_hourly)
```

```
## # A tibble: 8 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 gender count median
##   <fct>        <chr>  <int>  <dbl>
## 1 <25          Female    12   31.4
## 2 25-34        Female    21   31.2
## 3 25-34        Male      13   30.8
## 4 35-44        Female    10   33.1
## 5 35-44        Male       7   35.9
## 6 45-54        Female    11   41.4
## 7 55-64        Female     5   42.1
## 8 55-64        Male       7   33.4
```

```
current_news_gender_salaried_under_40 <- filter(news_salaried, age < 40) %>% group_by(gender)
current_news_gender_salaried_under_40 <- current_news_gender_salaried_under_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_salaried_under_40)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female   174  84030
## 2 Male     130  95890
```

```
current_news_gender_salaried_over_40 <- filter(news_salaried, age > 39) %>% group_by(gender)
current_news_gender_salaried_over_40 <- current_news_gender_salaried_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_salaried_over_40)
```

```
## # A tibble: 2 x 3
##   gender count  median
##   <chr>  <int>   <dbl>
## 1 Female   110 126000
## 2 Male     160 127765.
```

```
current_news_gender_hourly_under_40 <- filter(news_hourly, age < 40) %>% group_by(gender)
current_news_gender_hourly_under_40 <- current_news_gender_hourly_under_40 %>% summarise(
```

```
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_hourly_under_40)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    38   31.4
## 2 Male      18   32.0
```

```
current_news_gender_hourly_over_40 <- filter(news_hourly, age > 39) %>% group_by(gender)
current_news_gender_hourly_over_40 <- current_news_gender_hourly_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_gender_hourly_over_40)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    25   41.4
## 2 Male      15   33.4
```

Race and ethnicity

```
current_news_race_salaried <- news_salaried %>% group_by(race_ethnicity)
current_news_race_salaried <- current_news_race_salaried %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_news_race_salaried)
```

```
## # A tibble: 7 x 2
##   race_ethnicity                                         count
##   <chr>                                                  <int>
## 1 White (United States of America)                         406
## 2 Black or African American (United States of America)     48
## 3 Asian (United States of America)                          46
## 4 Hispanic or Latino (United States of America)             28
## 5 <NA>                                                      21
## 6 Two or More Races (United States of America)              14
## 7 Prefer Not to Disclose (United States of America)          8
```

```
current_news_race_hourly <- news_hourly %>% group_by(race_ethnicity)
current_news_race_hourly <- current_news_race_hourly %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_news_race_hourly)
```

```
## # A tibble: 3 x 2
##   race_ethnicity                                         count
##   <chr>                                                  <int>
## 1 White (United States of America)                          64
## 2 Black or African American (United States of America)     13
## 3 Asian (United States of America)                          11
```

```r
current_news_race_group_salaried <- news_salaried %>% group_by(race_grouping)
current_news_race_group_salaried <- current_news_race_group_salaried %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_news_race_group_salaried)
```

```
## # A tibble: 3 x 2
##   race_grouping   count
##   <chr>           <int>
## 1 white             406
## 2 person of color   139
## 3 unknown            29
```

```r
current_news_race_group_hourly <- news_hourly %>% group_by(race_grouping)
current_news_race_group_hourly <- current_news_race_group_hourly %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_news_race_group_hourly)
```

```
## # A tibble: 2 x 2
##   race_grouping   count
##   <chr>           <int>
## 1 white              64
## 2 person of color    30
```

```r
current_news_race_salaried_median <- news_salaried %>% group_by(race_ethnicity)
current_news_race_salaried_median <- current_news_race_salaried_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_race_salaried_median)
```

```
## # A tibble: 7 x 3
##   race_ethnicity                                      count  median
##   <chr>                                               <int>   <dbl>
## 1 <NA>                                                   21 140000
## 2 White (United States of America)                      406 106212.
## 3 Black or African American (United States of America)   48  97276.
## 4 Asian (United States of America)                       46  95205.
## 5 Hispanic or Latino (United States of America)          28  82890
## 6 Prefer Not to Disclose (United States of America)       8  82140
## 7 Two or More Races (United States of America)           14  79860
```

```r
current_news_race_hourly_median <- news_hourly %>% group_by(race_ethnicity)
current_news_race_hourly_median <- current_news_race_hourly_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_race_hourly_median)
```

```
## # A tibble: 3 x 3
##   race_ethnicity                                      count median
##   <chr>                                               <int>  <dbl>
## 1 White (United States of America)                       64   33.6
## 2 Asian (United States of America)                       11   31.7
## 3 Black or African American (United States of America)   13   29.4
```

```r
current_news_race_group_salaried_median <- news_salaried %>% group_by(race_grouping)
current_news_race_group_salaried_median <- current_news_race_group_salaried_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_race_group_salaried_median)
```

```
## # A tibble: 3 x 3
##   race_grouping   count  median
##   <chr>           <int>   <dbl>
## 1 unknown            29 134780
## 2 white             406 106212.
## 3 person of color   139  92080
```

```r
current_news_race_group_hourly_median <- news_hourly %>% group_by(race_grouping)
current_news_race_group_hourly_median <- current_news_race_group_hourly_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_race_group_hourly_median)
```

```
## # A tibble: 2 x 3
##   race_grouping   count median
##   <chr>           <int>  <dbl>
## 1 white              64   33.6
## 2 person of color    30   30.1
```

```r
current_news_race_age_salaried <- news_salaried %>% group_by(race_ethnicity)
current_news_race_age_salaried %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 9 x 2
##   race_ethnicity                                                  median_age
##   <chr>                                                                <dbl>
## 1 American Indian or Alaska Native (United States of America)          49.5
## 2 Asian (United States of America)                                     33
## 3 Black or African American (United States of America)                 39.5
## 4 Hispanic or Latino (United States of America)                        37
## 5 Native Hawaiian or Other Pacific Islander (United States of A~       43
## 6 Prefer Not to Disclose (United States of America)                    30.5
## 7 Two or More Races (United States of America)                         28
## 8 White (United States of America)                                     40
## 9 <NA>                                                                 36
```

```r
current_news_race_age_hourly <- news_hourly %>% group_by(race_ethnicity)
current_news_race_age_hourly %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 8 x 2
##   race_ethnicity                                               median_age
##   <chr>                                                             <dbl>
## 1 American Indian or Alaska Native (United States of America)       69
## 2 Asian (United States of America)                                  36
## 3 Black or African American (United States of America)              28
```

```
## 4 Hispanic or Latino (United States of America)                    26
## 5 Prefer Not to Disclose (United States of America)                 23
## 6 Two or More Races (United States of America)                      22.5
## 7 White (United States of America)                                  39.5
## 8 <NA>                                                              31
```

```r
current_news_race_age_5_salary <- news_salaried %>% group_by(age_group_5, race_ethnicity)
current_news_race_age_5_salary <- current_news_race_age_5_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_age_5_salary)
```

```
## # A tibble: 25 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 race_ethnicity                                  count median
##    <fct>       <chr>                                           <int>  <dbl>
##  1 <25         Asian (United States of America)                    5 65780
##  2 <25         White (United States of America)                   12 65140
##  3 25-29       Asian (United States of America)                   11 77000
##  4 25-29       Black or African American (United States of Am~    6 81000
##  5 25-29       Two or More Races (United States of America)        6 75690
##  6 25-29       White (United States of America)                   59 81757.
##  7 30-34       Asian (United States of America)                   10 95780
##  8 30-34       Black or African American (United States of Am~    9 88133.
##  9 30-34       Hispanic or Latino (United States of America)       6 80596.
## 10 30-34       White (United States of America)                   66 92640
## # ... with 15 more rows
```

```r
current_news_race_age_5_hourly <- news_hourly %>% group_by(age_group_5, race_ethnicity)
current_news_race_age_5_hourly <- current_news_race_age_5_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_age_5_hourly)
```

```
## # A tibble: 10 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 race_ethnicity                                  count median
##    <fct>       <chr>                                           <int>  <dbl>
##  1 <25         White (United States of America)                    7   18.5
##  2 25-29       Black or African American (United States of Am~     8   30.1
##  3 25-29       White (United States of America)                   11   30.8
##  4 30-34       White (United States of America)                    9   33.7
##  5 35-39       White (United States of America)                    5   34.7
##  6 40-44       White (United States of America)                    7   41.4
##  7 45-49       White (United States of America)                    5   44.5
##  8 50-54       White (United States of America)                    6   40.2
##  9 55-59       White (United States of America)                    6   33.9
## 10 60-64       White (United States of America)                    5   38.8
```

```r
current_news_race_age_10_salary <- news_salaried %>% group_by(age_group_10, race_ethnicity)
current_news_race_age_10_salary <- current_news_race_age_10_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
```

```r
suppress(current_news_race_age_10_salary)
```

```
## # A tibble: 21 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 race_ethnicity                                    count median
##    <fct>        <chr>                                             <int>  <dbl>
##  1 <25          Asian (United States of America)                      5 6.58e4
##  2 <25          White (United States of America)                     12 6.51e4
##  3 25-34        Asian (United States of America)                     21 8.60e4
##  4 25-34        Black or African American (United States of A~      15 8.70e4
##  5 25-34        Hispanic or Latino (United States of America)        10 8.12e4
##  6 25-34        Prefer Not to Disclose (United States of Amer~        5 7.85e4
##  7 25-34        Two or More Races (United States of America)          9 7.64e4
##  8 25-34        White (United States of America)                    125 8.60e4
##  9 25-34        <NA>                                                  9 1.16e5
## 10 35-44        Asian (United States of America)                     11 1.08e5
## # ... with 11 more rows
```

```r
current_news_race_age_10_hourly <- news_hourly %>% group_by(age_group_10, race_ethnicity)
current_news_race_age_10_hourly <- current_news_race_age_10_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_age_10_hourly)
```

```
## # A tibble: 6 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 race_ethnicity                                    count median
##   <fct>        <chr>                                             <int>  <dbl>
## 1 <25          White (United States of America)                      7   18.5
## 2 25-34        Black or African American (United States of Am~       8   30.1
## 3 25-34        White (United States of America)                     20   31.3
## 4 35-44        White (United States of America)                     12   35.3
## 5 45-54        White (United States of America)                     11   41.4
## 6 55-64        White (United States of America)                     11   34.9
```

```r
current_news_race_group_age_5_salary <- news_salaried %>% group_by(age_group_5, race_grouping)
current_news_race_group_age_5_salary <- current_news_race_group_age_5_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_group_age_5_salary)
```

```
## # A tibble: 21 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 race_grouping   count  median
##    <fct>       <chr>           <int>   <dbl>
##  1 <25         person of color    11  63780
##  2 <25         white              12  65140
##  3 25-29       person of color    27  80000
##  4 25-29       unknown             5  88280
##  5 25-29       white              59  81757.
##  6 30-34       person of color    28  86983.
##  7 30-34       unknown             9 108000
##  8 30-34       white              66  92640
```

```
##  9 35-39       person of color    23  99238.
## 10 35-39       white              61 105780
## # ... with 11 more rows
```

```
current_news_race_group_age_5_hourly <- news_hourly %>% group_by(age_group_5, race_grouping)
current_news_race_group_age_5_hourly <- current_news_race_group_age_5_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_group_age_5_hourly)
```

```
## # A tibble: 11 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 race_grouping   count median
##    <fct>       <chr>           <int>  <dbl>
##  1 <25         person of color     6   29.5
##  2 <25         white               7   18.5
##  3 25-29       person of color    12   27.1
##  4 25-29       white              11   30.8
##  5 30-34       white               9   33.7
##  6 35-39       white               5   34.7
##  7 40-44       white               7   41.4
##  8 45-49       white               5   44.5
##  9 50-54       white               6   40.2
## 10 55-59       white               6   33.9
## 11 60-64       white               5   38.8
```

```
current_news_race_group_age_10_salary <- news_salaried %>% group_by(age_group_10, race_grouping)
current_news_race_group_age_10_salary <- current_news_race_group_age_10_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_group_age_10_salary)
```

```
## # A tibble: 13 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 race_grouping   count  median
##    <fct>        <chr>           <int>   <dbl>
##  1 <25          person of color    11  63780
##  2 <25          white              12  65140
##  3 25-34        person of color    55  83340
##  4 25-34        unknown            14 106890
##  5 25-34        white             125  86000
##  6 35-44        person of color    38 102890
##  7 35-44        unknown             7 140280
##  8 35-44        white             104 115258.
##  9 45-54        person of color    26 106932.
## 10 45-54        white              84 116687.
## 11 55-64        person of color     8 140424.
## 12 55-64        white              68 140052.
## 13 65+          white              13 159300
```

```
current_news_race_group_age_10_hourly <- news_hourly %>% group_by(age_group_10, race_grouping)
current_news_race_group_age_10_hourly <- current_news_race_group_age_10_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
```

```r
)
suppress(current_news_race_group_age_10_hourly)
```

```
## # A tibble: 8 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 race_grouping   count median
##   <fct>        <chr>           <int>  <dbl>
## 1 <25          person of color     6   29.5
## 2 <25          white               7   18.5
## 3 25-34        person of color    13   29.1
## 4 25-34        white              20   31.3
## 5 35-44        person of color     5   23.9
## 6 35-44        white              12   35.3
## 7 45-54        white              11   41.4
## 8 55-64        white              11   34.9
```

```r
current_news_race_salaried_under_40 <- filter(news_salaried, age < 40) %>% group_by(race_ethnicity)
current_news_race_salaried_under_40 <- current_news_race_salaried_under_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_race_salaried_under_40)
```

```
## # A tibble: 7 x 3
##   race_ethnicity                                          count  median
##   <chr>                                                   <int>   <dbl>
## 1 <NA>                                                       11 125000
## 2 White (United States of America)                          198  90780
## 3 Black or African American (United States of America)       24  87970.
## 4 Asian (United States of America)                           33  87000
## 5 Hispanic or Latino (United States of America)              19  79618.
## 6 Prefer Not to Disclose (United States of America)           6  77750
## 7 Two or More Races (United States of America)               13  76380
```

```r
current_news_race_salaried_over_40 <- filter(news_salaried, age > 39) %>% group_by(race_ethnicity)
current_news_race_salaried_over_40 <- current_news_race_salaried_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_race_salaried_over_40)
```

```
## # A tibble: 5 x 3
##   race_ethnicity                                          count  median
##   <chr>                                                   <int>   <dbl>
## 1 <NA>                                                       10 151408.
## 2 White (United States of America)                          208 128484.
## 3 Hispanic or Latino (United States of America)               9 126580
## 4 Asian (United States of America)                           13 111761.
## 5 Black or African American (United States of America)       24 109396.
```

```r
current_news_race_hourly_under_40 <- filter(news_hourly, age < 40) %>% group_by(race_ethnicity)
current_news_race_hourly_under_40 <- current_news_race_hourly_under_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_race_hourly_under_40)
```

```
## # A tibble: 3 x 3
##   race_ethnicity                                           count median
##   <chr>                                                    <int>  <dbl>
## 1 White (United States of America)                            32   32.0
## 2 Black or African American (United States of America)       10   29.9
## 3 Asian (United States of America)                             7   25.0
```

```
current_news_race_hourly_over_40 <- filter(news_hourly, age > 39) %>% group_by(race_ethnicity)
current_news_race_hourly_over_40 <- current_news_race_hourly_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_race_hourly_over_40)
```

```
## # A tibble: 1 x 3
##   race_ethnicity                   count median
##   <chr>                            <int>  <dbl>
## 1 White (United States of America)    32   39.9
```

Gender x race/ethnicity

```
current_news_race_gender_salaried <- news_salaried %>% group_by(race_ethnicity, gender)
current_news_race_gender_salaried <- current_news_race_gender_salaried %>% summarise(
  count = length(current_base_pay)
)
suppress(current_news_race_gender_salaried)
```

```
## # A tibble: 13 x 3
## # Groups:   race_ethnicity [7]
##    race_ethnicity                                        gender count
##    <chr>                                                 <chr>  <int>
##  1 Asian (United States of America)                      Female    34
##  2 Asian (United States of America)                      Male      12
##  3 Black or African American (United States of America) Female    24
##  4 Black or African American (United States of America) Male      24
##  5 Hispanic or Latino (United States of America)         Female    14
##  6 Hispanic or Latino (United States of America)         Male      14
##  7 Prefer Not to Disclose (United States of America)     Male       5
##  8 Two or More Races (United States of America)          Female     9
##  9 Two or More Races (United States of America)          Male       5
## 10 White (United States of America)                      Female   188
## 11 White (United States of America)                      Male     218
## 12 <NA>                                                  Female    10
## 13 <NA>                                                  Male      11
```

```
current_news_race_gender_hourly <- news_hourly %>% group_by(race_ethnicity, gender)
current_news_race_gender_hourly <- current_news_race_gender_hourly %>% summarise(
  count = length(current_base_pay)
)
suppress(current_news_race_gender_hourly)
```

```
## # A tibble: 5 x 3
## # Groups:   race_ethnicity [3]
##   race_ethnicity                                         gender count
```

```
##   <chr>                                                <chr>  <int>
## 1 Asian (United States of America)                     Female     8
## 2 Black or African American (United States of America) Female     8
## 3 Black or African American (United States of America) Male       5
## 4 White (United States of America)                     Female    41
## 5 White (United States of America)                     Male      23
```

```
current_news_race_gender_median_salaried <- news_salaried %>% group_by(race_ethnicity, gender)
current_news_race_gender_median_salaried <- current_news_race_gender_median_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_gender_median_salaried)
```

```
## # A tibble: 13 x 4
## # Groups:   race_ethnicity [7]
##    race_ethnicity                                       gender count median
##    <chr>                                                <chr>  <int>  <dbl>
##  1 Asian (United States of America)                     Female    34 9.19e4
##  2 Asian (United States of America)                     Male      12 1.07e5
##  3 Black or African American (United States of America) Female    24 8.72e4
##  4 Black or African American (United States of America) Male      24 1.20e5
##  5 Hispanic or Latino (United States of America)        Female    14 8.12e4
##  6 Hispanic or Latino (United States of America)        Male      14 9.14e4
##  7 Prefer Not to Disclose (United States of America)    Male       5 8.83e4
##  8 Two or More Races (United States of America)         Female     9 7.50e4
##  9 Two or More Races (United States of America)         Male       5 9.49e4
## 10 White (United States of America)                     Female   188 9.96e4
## 11 White (United States of America)                     Male     218 1.17e5
## 12 <NA>                                                 Female    10 1.38e5
## 13 <NA>                                                 Male      11 1.40e5
```

```
current_news_race_gender_hourly_median <- news_hourly %>% group_by(race_ethnicity, gender)
current_news_race_gender_hourly_median <- current_news_race_gender_hourly_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_gender_hourly_median)
```

```
## # A tibble: 5 x 4
## # Groups:   race_ethnicity [3]
##   race_ethnicity                                       gender count median
##   <chr>                                                <chr>  <int>  <dbl>
## 1 Asian (United States of America)                     Female     8   30.0
## 2 Black or African American (United States of America) Female     8   31.0
## 3 Black or African American (United States of America) Male       5   20.9
## 4 White (United States of America)                     Female    41   34.7
## 5 White (United States of America)                     Male      23   33.4
```

```
current_news_race_gender_salaried_under_40 <- filter(news_salaried, age < 40) %>% group_by(race_ethnici
current_news_race_gender_salaried_under_40 <- current_news_race_gender_salaried_under_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_gender_salaried_under_40)
```

```
## # A tibble: 10 x 4
## # Groups:   race_ethnicity [6]
##    race_ethnicity                                        gender count median
##    <chr>                                                 <chr>  <int>  <dbl>
##  1 Asian (United States of America)                      Female    25 8.60e4
##  2 Asian (United States of America)                      Male       8 1.03e5
##  3 Black or African American (United States of America) Female    16 8.54e4
##  4 Black or African American (United States of America) Male       8 1.28e5
##  5 Hispanic or Latino (United States of America)         Female    12 8.01e4
##  6 Hispanic or Latino (United States of America)         Male       7 7.50e4
##  7 Two or More Races (United States of America)          Female     9 7.50e4
##  8 White (United States of America)                      Female   105 8.58e4
##  9 White (United States of America)                      Male      93 9.57e4
## 10 <NA>                                                  Male       7 1.35e5
```

```
current_news_race_gender_salaried_over_40 <- filter(news_salaried, age > 39) %>% group_by(race_ethnicit
current_news_race_gender_salaried_over_40 <- current_news_race_gender_salaried_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_gender_salaried_over_40)
```

```
## # A tibble: 7 x 4
## # Groups:   race_ethnicity [5]
##   race_ethnicity                                        gender count  median
##   <chr>                                                 <chr>  <int>   <dbl>
## 1 Asian (United States of America)                      Female     9 111761.
## 2 Black or African American (United States of America) Female     8 115002.
## 3 Black or African American (United States of America) Male      16 107464.
## 4 Hispanic or Latino (United States of America)         Male       7 126580
## 5 White (United States of America)                      Female    83 122917.
## 6 White (United States of America)                      Male     125 130000
## 7 <NA>                                                  Female     6 148572.
```

```
current_news_race_gender_hourly_under_40 <- filter(news_hourly, age < 40) %>% group_by(race_ethnicity, g
current_news_race_gender_hourly_under_40 <- current_news_race_gender_hourly_under_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_gender_hourly_under_40)
```

```
## # A tibble: 4 x 4
## # Groups:   race_ethnicity [3]
##   race_ethnicity                                        gender count median
##   <chr>                                                 <chr>  <int>  <dbl>
## 1 Asian (United States of America)                      Female     5   25.0
## 2 Black or African American (United States of America) Female     6   31.0
## 3 White (United States of America)                      Female    21   31.9
## 4 White (United States of America)                      Male      11   33.7
```

```
current_news_race_gender_hourly_over_40 <- filter(news_hourly, age > 39) %>% group_by(race_ethnicity, ge
current_news_race_gender_hourly_over_40 <- current_news_race_gender_hourly_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_race_gender_hourly_over_40)
```

```
## # A tibble: 2 x 4
## # Groups:   race_ethnicity [1]
##   race_ethnicity                     gender count median
##   <chr>                              <chr>  <int>  <dbl>
## 1 White (United States of America) Female    20   42.4
## 2 White (United States of America) Male      12   33.2
```

Years of service

```
current_news_yos_salaried <- news_salaried %>% group_by(years_of_service_grouped)
current_news_yos_salaried <- current_news_yos_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_yos_salaried)
```

```
## # A tibble: 8 x 3
##   years_of_service_grouped count  median
##   <fct>                    <int>   <dbl>
## 1 0                           65  90000
## 2 1-2                        128  93780
## 3 3-5                        146  92170.
## 4 6-10                        60 112926.
## 5 11-15                       50 110823.
## 6 16-20                       68 127655.
## 7 21-25                       24 143198.
## 8 25+                         33 139831.
```

```
current_news_yos_hourly <- news_hourly %>% group_by(years_of_service_grouped)
current_news_yos_hourly <- current_news_yos_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_yos_hourly)
```

```
## # A tibble: 7 x 3
##   years_of_service_grouped count median
##   <fct>                    <int>  <dbl>
## 1 0                           16   29.5
## 2 1-2                         26   32.7
## 3 3-5                          9   33.0
## 4 6-10                        15   35.9
## 5 11-15                       10   36.5
## 6 16-20                       11   32.3
## 7 21-25                        5   38.9
```

```
current_news_yos_gender_salaried <- news_salaried %>% group_by(years_of_service_grouped, gender)
current_news_yos_gender_salaried <- current_news_yos_gender_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_yos_gender_salaried)
```

```
## # A tibble: 16 x 4
## # Groups:   years_of_service_grouped [8]
```

```
##    years_of_service_grouped gender count  median
##    <fct>                    <chr>  <int>   <dbl>
##  1 0                        Female    39  80000
##  2 0                        Male      26 105000
##  3 1-2                      Female    70  87390
##  4 1-2                      Male      58 101788.
##  5 3-5                      Female    72  88530
##  6 3-5                      Male      74  95265.
##  7 6-10                     Female    26 100640.
##  8 6-10                     Male      34 119562.
##  9 11-15                    Female    25  98545.
## 10 11-15                    Male      25 129780
## 11 16-20                    Female    28 119826.
## 12 16-20                    Male      40 129745.
## 13 21-25                    Female    11 134780
## 14 21-25                    Male      13 148417.
## 15 25+                      Female    13 142280
## 16 25+                      Male      20 131793.
```

```
current_news_yos_gender_hourly <- news_hourly %>% group_by(years_of_service_grouped, gender)
current_news_yos_gender_hourly <- current_news_yos_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_yos_gender_hourly)
```

```
## # A tibble: 9 x 4
## # Groups:   years_of_service_grouped [6]
##   years_of_service_grouped gender count median
##   <fct>                    <chr>  <int>  <dbl>
## 1 0                        Female    11   28.2
## 2 0                        Male       5   30.8
## 3 1-2                      Female    18   32.4
## 4 1-2                      Male       8   33.3
## 5 3-5                      Male       6   32.5
## 6 6-10                     Female     8   31.4
## 7 6-10                     Male       7   36.7
## 8 11-15                    Female     9   38.4
## 9 16-20                    Female     7   42.1
```

```
current_news_yos_race_salaried <- news_salaried %>% group_by(years_of_service_grouped, race_ethnicity)
current_news_yos_race_salaried <- current_news_yos_race_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_yos_race_salaried)
```

```
## # A tibble: 21 x 4
## # Groups:   years_of_service_grouped [8]
##    years_of_service_gro~ race_ethnicity                        count median
##    <fct>                 <chr>                                 <int>  <dbl>
##  1 0                     Asian (United States of America)          7 7.70e4
##  2 0                     White (United States of America)         42 1.00e5
##  3 1-2                   Asian (United States of America)         13 8.48e4
##  4 1-2                   Black or African American (United St~    10 8.98e4
```

```
##   5 1-2                    Hispanic or Latino (United States of~     6 8.29e4
##   6 1-2                    Two or More Races (United States of ~     5 6.80e4
##   7 1-2                    White (United States of America)         85 9.58e4
##   8 1-2                    <NA>                                      5 1.40e5
##   9 3-5                    Asian (United States of America)         12 9.36e4
##  10 3-5                    Black or African American (United St~    12 9.73e4
## # ... with 11 more rows
```

```
current_news_yos_race_hourly <- news_hourly %>% group_by(years_of_service_grouped, race_ethnicity)
current_news_yos_race_hourly <- current_news_yos_race_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_yos_race_hourly)
```

```
## # A tibble: 7 x 4
## # Groups:   years_of_service_grouped [7]
##   years_of_service_grouped race_ethnicity                   count median
##   <fct>                    <chr>                            <int>  <dbl>
## 1 0                        White (United States of America)     6   29.5
## 2 1-2                      White (United States of America)    18   32.8
## 3 3-5                      White (United States of America)     6   32.5
## 4 6-10                     White (United States of America)     9   35.9
## 5 11-15                    White (United States of America)     8   39.9
## 6 16-20                    White (United States of America)     9   42.1
## 7 21-25                    White (United States of America)     5   38.9
```

```
current_news_yos_race_gender_salaried <- news_salaried %>% group_by(years_of_service_grouped, race_ethni
current_news_yos_race_gender_salaried <- current_news_yos_race_gender_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_yos_race_gender_salaried)
```

```
## # A tibble: 26 x 5
## # Groups:   years_of_service_grouped, race_ethnicity [16]
##    years_of_service_gr~ race_ethnicity                 gender count median
##    <fct>                <chr>                          <chr>  <int>  <dbl>
##  1 0                    Asian (United States of Americ~ Female     7 7.70e4
##  2 0                    White (United States of Americ~ Female    25 8.50e4
##  3 0                    White (United States of Americ~ Male      17 1.10e5
##  4 1-2                  Asian (United States of Americ~ Female    11 7.70e4
##  5 1-2                  Black or African American (Uni~ Female     6 8.58e4
##  6 1-2                  Hispanic or Latino (United Sta~ Female     5 8.20e4
##  7 1-2                  White (United States of Americ~ Female    41 9.08e4
##  8 1-2                  White (United States of Americ~ Male      44 9.98e4
##  9 3-5                  Asian (United States of Americ~ Female     8 9.36e4
## 10 3-5                  Black or African American (Uni~ Female     7 9.61e4
## # ... with 16 more rows
```

```
current_news_yos_race_gender_hourly <- news_hourly %>% group_by(years_of_service_grouped, race_ethnicity
current_news_yos_race_gender_hourly <- current_news_yos_race_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_yos_race_gender_hourly)
```

```
## # A tibble: 5 x 5
## # Groups:   years_of_service_grouped, race_ethnicity [4]
##   years_of_service_group~ race_ethnicity                gender count median
##   <fct>                   <chr>                         <chr>  <int>  <dbl>
## 1 1-2                     White (United States of Amer~ Female    12   32.7
## 2 1-2                     White (United States of Amer~ Male       6   33.3
## 3 6-10                    White (United States of Amer~ Male       5   35.9
## 4 11-15                   White (United States of Amer~ Female     7   41.4
## 5 16-20                   White (United States of Amer~ Female     6   42.4
```

Age

```
current_median_news_age_5_salaried <- news_salaried %>% group_by(age_group_5)
current_median_news_age_5_salaried <- current_median_news_age_5_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_salaried)
```

```
## # A tibble: 10 x 3
##    age_group_5 count  median
##    <fct>       <int>   <dbl>
##  1 <25            24  64640
##  2 25-29          91  80500
##  3 30-34         103  90780
##  4 35-39          86 105691.
##  5 40-44          63 125769.
##  6 45-49          43 102796.
##  7 50-54          70 115770.
##  8 55-59          51 147780
##  9 60-64          28 131217.
## 10 65+            15 157095.
```

```
current_median_news_age_5_hourly <- news_hourly %>% group_by(age_group_5)
current_median_news_age_5_hourly <- current_median_news_age_5_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_hourly)
```

```
## # A tibble: 10 x 3
##    age_group_5 count median
##    <fct>       <int>  <dbl>
##  1 <25            14   29.5
##  2 25-29          23   30.8
##  3 30-34          11   33.7
##  4 35-39           8   33.9
##  5 40-44           9   33.1
##  6 45-49           6   47.4
##  7 50-54           8   36.2
##  8 55-59           7   34.9
##  9 60-64           5   38.8
## 10 65+             5   42.6
```

```r
current_median_news_age_10_salaried <- news_salaried %>% group_by(age_group_10)
current_median_news_age_10_salaried <- current_median_news_age_10_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_salaried)
```

```
## # A tibble: 6 x 3
##   age_group_10 count  median
##   <fct>        <int>   <dbl>
## 1 <25             24  64640
## 2 25-34          194  85890
## 3 35-44          149 115237.
## 4 45-54          113 114803
## 5 55-64           79 141016.
## 6 65+             15 157095.
```

```r
current_median_news_age_10_hourly <- news_hourly %>% group_by(age_group_10)
current_median_news_age_10_hourly <- current_median_news_age_10_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_hourly)
```

```
## # A tibble: 6 x 3
##   age_group_10 count median
##   <fct>        <int>  <dbl>
## 1 <25             14   29.5
## 2 25-34           34   31.0
## 3 35-44           17   33.1
## 4 45-54           14   41.1
## 5 55-64           12   35.8
## 6 65+              5   42.6
```

```r
current_news_age_5_yos_salary <- news_salaried %>% group_by(age_group_5, years_of_service_grouped)
current_news_age_5_yos_salary <- current_news_age_5_yos_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_age_5_yos_salary)
```

```
## # A tibble: 39 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 years_of_service_grouped count  median
##    <fct>       <fct>                    <int>   <dbl>
##  1 <25         0                            9  66000
##  2 <25         1-2                         13  63780
##  3 25-29       0                           19  82000
##  4 25-29       1-2                         30  78500
##  5 25-29       3-5                         41  81757.
##  6 30-34       0                           13  87000
##  7 30-34       1-2                         28  93528.
##  8 30-34       3-5                         43  88780
##  9 30-34       6-10                        15  82312.
## 10 35-39       0                            9 110000
```

```
## # ... with 29 more rows
```

```
current_news_age_5_yos_hourly <- news_hourly %>% group_by(age_group_5, years_of_service_grouped)
current_news_age_5_yos_hourly <- current_news_age_5_yos_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_age_5_yos_hourly)
```

```
## # A tibble: 4 x 4
## # Groups:   age_group_5 [2]
##   age_group_5 years_of_service_grouped count median
##   <fct>       <fct>                    <int>  <dbl>
## 1 <25         0                            6   24.1
## 2 <25         1-2                          8   32
## 3 25-29       0                            8   29.5
## 4 25-29       1-2                         12   32.2
```

```
current_news_age_10_yos_salary <- news_salaried %>% group_by(age_group_10, years_of_service_grouped)
current_news_age_10_yos_salary <- current_news_age_10_yos_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_age_10_yos_salary)
```

```
## # A tibble: 26 x 4
## # Groups:   age_group_10 [5]
##    age_group_10 years_of_service_grouped count  median
##    <fct>        <fct>                    <int>   <dbl>
##  1 <25          0                            9  66000
##  2 <25          1-2                         13  63780
##  3 25-34        0                           32  85000
##  4 25-34        1-2                         58  86280
##  5 25-34        3-5                         84  85890
##  6 25-34        6-10                        16  94676.
##  7 35-44        0                           16 125000
##  8 35-44        1-2                         36 116530
##  9 35-44        3-5                         38 110935.
## 10 35-44        6-10                        25 115237.
## # ... with 16 more rows
```

```
current_news_age_10_yos_hourly <- news_hourly %>% group_by(age_group_10, years_of_service_grouped)
current_news_age_10_yos_hourly <- current_news_age_10_yos_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_news_age_10_yos_hourly)
```

```
## # A tibble: 6 x 4
## # Groups:   age_group_10 [3]
##   age_group_10 years_of_service_grouped count median
##   <fct>        <fct>                    <int>  <dbl>
## 1 <25          0                            6   24.1
## 2 <25          1-2                          8   32
## 3 25-34        0                            9   30.8
## 4 25-34        1-2                         16   32.7
```

```
## 5 25-34        3-5                          6   30.0
## 6 35-44        11-15                        6   33.9
```

```
current_median_news_age_5_gender_salaried <- news_salaried %>% group_by(age_group_5, gender)
current_median_news_age_5_gender_salaried <- current_median_news_age_5_gender_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_gender_salaried)
```

```
## # A tibble: 20 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 gender count  median
##    <fct>       <chr>  <int>   <dbl>
##  1 <25         Female    19  64280
##  2 <25         Male       5  72000
##  3 25-29       Female    60  80000
##  4 25-29       Male      31  85500
##  5 30-34       Female    57  87000
##  6 30-34       Male      46  97828.
##  7 35-39       Female    38  98892.
##  8 35-39       Male      48 116030
##  9 40-44       Female    22 133200.
## 10 40-44       Male      41 125000
## 11 45-49       Female    20 117295.
## 12 45-49       Male      23  99725
## 13 50-54       Female    29 108864.
## 14 50-54       Male      41 126280.
## 15 55-59       Female    22 145655.
## 16 55-59       Male      29 147780
## 17 60-64       Female    12 129325.
## 18 60-64       Male      16 131217.
## 19 65+         Female     5 157095.
## 20 65+         Male      10 156260.
```

```
current_median_news_age_5_gender_hourly <- news_hourly %>% group_by(age_group_5, gender)
current_median_news_age_5_gender_hourly <- current_median_news_age_5_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_gender_hourly)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_5 [8]
##   age_group_5 gender count median
##   <fct>       <chr>  <int>  <dbl>
## 1 <25         Female    12   31.4
## 2 25-29       Female    17   31.2
## 3 25-29       Male       6   21.0
## 4 30-34       Male       7   33.7
## 5 35-39       Female     5   31.9
## 6 40-44       Female     5   41.4
## 7 45-49       Female     5   44.5
## 8 50-54       Female     6   40.2
## 9 55-59       Male       5   34.9
```

```r
current_median_news_age_10_gender_salaried <- news_salaried %>% group_by(age_group_10, gender)
current_median_news_age_10_gender_salaried <- current_median_news_age_10_gender_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_gender_salaried)
```

```
## # A tibble: 12 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 gender count  median
##    <fct>        <chr>  <int>   <dbl>
##  1 <25          Female    19  64280
##  2 <25          Male       5  72000
##  3 25-34        Female   117  83147.
##  4 25-34        Male      77  92500
##  5 35-44        Female    60 105691.
##  6 35-44        Male      89 118785
##  7 45-54        Female    49 108864.
##  8 45-54        Male      64 117982.
##  9 55-64        Female    34 140424.
## 10 55-64        Male      45 146542.
## 11 65+          Female     5 157095.
## 12 65+          Male      10 156260.
```

```r
current_median_news_age_10_gender_hourly <- news_hourly %>% group_by(age_group_10, gender)
current_median_news_age_10_gender_hourly <- current_median_news_age_10_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_gender_hourly)
```

```
## # A tibble: 8 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 gender count median
##   <fct>        <chr>  <int>  <dbl>
## 1 <25          Female    12   31.4
## 2 25-34        Female    21   31.2
## 3 25-34        Male      13   30.8
## 4 35-44        Female    10   33.1
## 5 35-44        Male       7   35.9
## 6 45-54        Female    11   41.4
## 7 55-64        Female     5   42.1
## 8 55-64        Male       7   33.4
```

```r
current_median_news_age_5_race_salaried <- news_salaried %>% group_by(age_group_5, race_ethnicity)
current_median_news_age_5_race_salaried <- current_median_news_age_5_race_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_race_salaried)
```

```
## # A tibble: 25 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 race_ethnicity                                    count median
##    <fct>       <chr>                                             <int>  <dbl>
```

```
##  1 <25         Asian (United States of America)                       5 65780
##  2 <25         White (United States of America)                      12 65140
##  3 25-29       Asian (United States of America)                      11 77000
##  4 25-29       Black or African American (United States of Am~       6 81000
##  5 25-29       Two or More Races (United States of America)           6 75690
##  6 25-29       White (United States of America)                      59 81757.
##  7 30-34       Asian (United States of America)                      10 95780
##  8 30-34       Black or African American (United States of Am~       9 88133.
##  9 30-34       Hispanic or Latino (United States of America)         6 80596.
## 10 30-34       White (United States of America)                      66 92640
## # ... with 15 more rows
```

```
current_median_news_age_5_race_hourly <- news_hourly %>% group_by(age_group_5, race_ethnicity)
current_median_news_age_5_race_hourly <- current_median_news_age_5_race_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_race_hourly)
```

```
## # A tibble: 10 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 race_ethnicity                                  count median
##    <fct>       <chr>                                           <int>  <dbl>
##  1 <25         White (United States of America)                    7   18.5
##  2 25-29       Black or African American (United States of Am~     8   30.1
##  3 25-29       White (United States of America)                   11   30.8
##  4 30-34       White (United States of America)                    9   33.7
##  5 35-39       White (United States of America)                    5   34.7
##  6 40-44       White (United States of America)                    7   41.4
##  7 45-49       White (United States of America)                    5   44.5
##  8 50-54       White (United States of America)                    6   40.2
##  9 55-59       White (United States of America)                    6   33.9
## 10 60-64       White (United States of America)                    5   38.8
```

```
current_median_news_age_10_race_salaried <- news_salaried %>% group_by(age_group_10, race_ethnicity)
current_median_news_age_10_race_salaried <- current_median_news_age_10_race_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_race_salaried)
```

```
## # A tibble: 21 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 race_ethnicity                                 count median
##    <fct>        <chr>                                          <int>  <dbl>
##  1 <25          Asian (United States of America)                   5 6.58e4
##  2 <25          White (United States of America)                  12 6.51e4
##  3 25-34        Asian (United States of America)                  21 8.60e4
##  4 25-34        Black or African American (United States of A~    15 8.70e4
##  5 25-34        Hispanic or Latino (United States of America)     10 8.12e4
##  6 25-34        Prefer Not to Disclose (United States of Amer~     5 7.85e4
##  7 25-34        Two or More Races (United States of America)       9 7.64e4
##  8 25-34        White (United States of America)                 125 8.60e4
##  9 25-34        <NA>                                               9 1.16e5
## 10 35-44        Asian (United States of America)                  11 1.08e5
```

```
## # ... with 11 more rows
```

```
current_median_news_age_10_race_hourly <- news_hourly %>% group_by(age_group_10, race_ethnicity)
current_median_news_age_10_race_hourly <- current_median_news_age_10_race_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_race_hourly)
```

```
## # A tibble: 6 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 race_ethnicity                                    count median
##   <fct>        <chr>                                             <int>  <dbl>
## 1 <25          White (United States of America)                      7   18.5
## 2 25-34        Black or African American (United States of Am~     8   30.1
## 3 25-34        White (United States of America)                     20   31.3
## 4 35-44        White (United States of America)                     12   35.3
## 5 45-54        White (United States of America)                     11   41.4
## 6 55-64        White (United States of America)                     11   34.9
```

```
current_median_news_age_5_race_group_salaried <- news_salaried %>% group_by(age_group_5, race_grouping)
current_median_news_age_5_race_group_salaried <- current_median_news_age_5_race_group_salaried %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_race_group_salaried)
```

```
## # A tibble: 21 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 race_grouping   count  median
##    <fct>       <chr>           <int>   <dbl>
##  1 <25         person of color    11  63780
##  2 <25         white              12  65140
##  3 25-29       person of color    27  80000
##  4 25-29       unknown             5  88280
##  5 25-29       white              59  81757.
##  6 30-34       person of color    28  86983.
##  7 30-34       unknown             9 108000
##  8 30-34       white              66  92640
##  9 35-39       person of color    23  99238.
## 10 35-39       white              61 105780
## # ... with 11 more rows
```

```
current_median_news_age_5_race_group_hourly <- news_hourly %>% group_by(age_group_5, race_grouping)
current_median_news_age_5_race_group_hourly <- current_median_news_age_5_race_group_hourly %>% summaris
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_race_group_hourly)
```

```
## # A tibble: 11 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 race_grouping   count median
##    <fct>       <chr>           <int>  <dbl>
##  1 <25         person of color     6   29.5
##  2 <25         white               7   18.5
```

```
##   3 25-29       person of color    12   27.1
##   4 25-29       white              11   30.8
##   5 30-34       white               9   33.7
##   6 35-39       white               5   34.7
##   7 40-44       white               7   41.4
##   8 45-49       white               5   44.5
##   9 50-54       white               6   40.2
##  10 55-59       white               6   33.9
##  11 60-64       white               5   38.8
```

```
current_median_news_age_10_race_group_salaried <- news_salaried %>% group_by(age_group_10, race_grouping
current_median_news_age_10_race_group_salaried <- current_median_news_age_10_race_group_salaried %>% su
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_race_group_salaried)
```

```
## # A tibble: 13 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 race_grouping   count  median
##    <fct>        <chr>           <int>   <dbl>
##  1 <25          person of color    11  63780
##  2 <25          white              12  65140
##  3 25-34        person of color    55  83340
##  4 25-34        unknown            14 106890
##  5 25-34        white             125  86000
##  6 35-44        person of color    38 102890
##  7 35-44        unknown             7 140280
##  8 35-44        white             104 115258.
##  9 45-54        person of color    26 106932.
## 10 45-54        white              84 116687.
## 11 55-64        person of color     8 140424.
## 12 55-64        white              68 140052.
## 13 65+          white              13 159300
```

```
current_median_news_age_10_race_group_hourly <- news_hourly %>% group_by(age_group_10, race_grouping)
current_median_news_age_10_race_group_hourly <- current_median_news_age_10_race_group_hourly %>% summar
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_race_group_hourly)
```

```
## # A tibble: 8 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 race_grouping   count median
##   <fct>        <chr>           <int>  <dbl>
## 1 <25          person of color     6   29.5
## 2 <25          white               7   18.5
## 3 25-34        person of color    13   29.1
## 4 25-34        white              20   31.3
## 5 35-44        person of color     5   23.9
## 6 35-44        white              12   35.3
## 7 45-54        white              11   41.4
## 8 55-64        white              11   34.9
```

```
current_median_news_age_5_race_gender_salaried <- news_salaried %>% group_by(age_group_5, race_ethnicity
current_median_news_age_5_race_gender_salaried <- current_median_news_age_5_race_gender_salaried %>% sum
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_race_gender_salaried)
```

```
## # A tibble: 30 x 5
## # Groups:   age_group_5, race_ethnicity [22]
##    age_group_5 race_ethnicity                          gender count median
##    <fct>       <chr>                                   <chr>  <int>  <dbl>
##  1 <25         Asian (United States of America)        Female     5 6.58e4
##  2 <25         White (United States of America)        Female     9 6.43e4
##  3 25-29       Asian (United States of America)        Female     9 7.70e4
##  4 25-29       Black or African American (United State~ Female     5 8.00e4
##  5 25-29       White (United States of America)        Female    38 8.19e4
##  6 25-29       White (United States of America)        Male      21 7.68e4
##  7 30-34       Asian (United States of America)        Female     8 1.01e5
##  8 30-34       Black or African American (United State~ Female     5 8.58e4
##  9 30-34       Hispanic or Latino (United States of Am~ Female     6 8.06e4
## 10 30-34       White (United States of America)        Female    32 8.77e4
## # ... with 20 more rows
```

```
current_median_news_age_5_race_gender_hourly <- news_hourly %>% group_by(age_group_5, race_ethnicity, ge
current_median_news_age_5_race_gender_hourly <- current_median_news_age_5_race_gender_hourly %>% summari
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_race_gender_hourly)
```

```
## # A tibble: 5 x 5
## # Groups:   age_group_5, race_ethnicity [5]
##   age_group_5 race_ethnicity                   gender count median
##   <fct>       <chr>                            <chr>  <int>  <dbl>
## 1 <25         White (United States of America) Female     5   32
## 2 25-29       White (United States of America) Female    10   31.2
## 3 30-34       White (United States of America) Male       6   34.4
## 4 45-49       White (United States of America) Female     5   44.5
## 5 55-59       White (United States of America) Male       5   34.9
```

```
current_median_news_age_10_race_gender_salaried <- news_salaried %>% group_by(age_group_10, race_ethnic
current_median_news_age_10_race_gender_salaried <- current_median_news_age_10_race_gender_salaried %>% s
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_race_gender_salaried)
```

```
## # A tibble: 23 x 5
## # Groups:   age_group_10, race_ethnicity [17]
##    age_group_10 race_ethnicity                         gender count median
##    <fct>        <chr>                                  <chr>  <int>  <dbl>
##  1 <25          Asian (United States of America)       Female     5 6.58e4
##  2 <25          White (United States of America)       Female     9 6.43e4
##  3 25-34        Asian (United States of America)       Female    17 8.70e4
##  4 25-34        Black or African American (United Stat~ Female    10 8.10e4
```

```
##  5 25-34        Black or African American (United Stat~ Male       5 1.40e5
##  6 25-34        Hispanic or Latino (United States of A~ Female     8 8.12e4
##  7 25-34        Two or More Races (United States of Am~ Female     6 7.57e4
##  8 25-34        White (United States of America)        Female    70 8.46e4
##  9 25-34        White (United States of America)        Male      55 9.08e4
## 10 25-34        <NA>                                    Male       6 1.32e5
## # ... with 13 more rows
```

```
current_median_news_age_10_race_gender_hourly <- news_hourly %>% group_by(age_group_10, race_ethnicity,
current_median_news_age_10_race_gender_hourly <- current_median_news_age_10_race_gender_hourly %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_race_gender_hourly)
```

```
## # A tibble: 7 x 5
## # Groups:   age_group_10, race_ethnicity [5]
##   age_group_10 race_ethnicity                   gender count median
##   <fct>        <chr>                            <chr>  <int>  <dbl>
## 1 <25          White (United States of America) Female     5   32
## 2 25-34        White (United States of America) Female    13   30.8
## 3 25-34        White (United States of America) Male       7   33.7
## 4 35-44        White (United States of America) Female     7   34.7
## 5 35-44        White (United States of America) Male       5   35.9
## 6 45-54        White (United States of America) Female     9   44.5
## 7 55-64        White (United States of America) Male       7   33.4
```

```
current_median_news_age_5_race_group_gender_salaried <- news_salaried %>% group_by(age_group_5, race_gro
current_median_news_age_5_race_group_gender_salaried <- current_median_news_age_5_race_group_gender_sala
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_race_group_gender_salaried)
```

```
## # A tibble: 31 x 5
## # Groups:   age_group_5, race_grouping [18]
##    age_group_5 race_grouping   gender count  median
##    <fct>       <chr>           <chr>  <int>   <dbl>
##  1 <25         person of color Female    10  64390
##  2 <25         white           Female     9  64280
##  3 25-29       person of color Female    19  77000
##  4 25-29       person of color Male       8  88540
##  5 25-29       white           Female    38  81878.
##  6 25-29       white           Male      21  76780
##  7 30-34       person of color Female    22  86373.
##  8 30-34       person of color Male       6 106000
##  9 30-34       unknown         Male       6 120390
## 10 30-34       white           Female    32  87660
## # ... with 21 more rows
```

```
current_median_news_age_5_race_group_gender_hourly <- news_hourly %>% group_by(age_group_5, race_groupi
current_median_news_age_5_race_group_gender_hourly <- current_median_news_age_5_race_group_gender_hourl
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_5_race_group_gender_hourly)
```

```
## # A tibble: 8 x 5
## # Groups:   age_group_5, race_grouping [7]
##   age_group_5 race_grouping   gender count median
##   <fct>       <chr>           <chr>  <int>  <dbl>
## 1 <25         person of color Female     6   29.5
## 2 <25         white           Female     5   32
## 3 25-29       person of color Female     7   31.2
## 4 25-29       person of color Male       5   20.9
## 5 25-29       white           Female    10   31.2
## 6 30-34       white           Male       6   34.4
## 7 45-49       white           Female     5   44.5
## 8 55-59       white           Male       5   34.9
```

```
current_median_news_age_10_race_group_gender_salaried <- news_salaried %>% group_by(age_group_10, race_g
current_median_news_age_10_race_group_gender_salaried <- current_median_news_age_10_race_group_gender_sa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_race_group_gender_salaried)
```

```
## # A tibble: 20 x 5
## # Groups:   age_group_10, race_grouping [12]
##    age_group_10 race_grouping   gender count  median
##    <fct>        <chr>           <chr>  <int>   <dbl>
##  1 <25          person of color Female    10  64390
##  2 <25          white           Female     9  64280
##  3 25-34        person of color Female    41  82000.
##  4 25-34        person of color Male      14  89540
##  5 25-34        unknown         Female     6  92140
##  6 25-34        unknown         Male       8 120390
##  7 25-34        white           Female    70  84640
##  8 25-34        white           Male      55  90780
##  9 35-44        person of color Female    19 100000
## 10 35-44        person of color Male      19 113280
## 11 35-44        white           Female    37 105000
## 12 35-44        white           Male      67 120780
## 13 45-54        person of color Female     7 108864.
## 14 45-54        person of color Male      19 105000
## 15 45-54        white           Female    42 111589.
## 16 45-54        white           Male      42 123530.
## 17 55-64        person of color Female     6 142688.
## 18 55-64        white           Female    26 130924.
## 19 55-64        white           Male      42 147161.
## 20 65+          white           Male       9 159458.
```

```
current_median_news_age_10_race_group_gender_hourly <- news_hourly %>% group_by(age_group_10, race_grou
current_median_news_age_10_race_group_gender_hourly <- current_median_news_age_10_race_group_gender_hou
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_news_age_10_race_group_gender_hourly)
```

```
## # A tibble: 10 x 5
## # Groups:   age_group_10, race_grouping [7]
##    age_group_10 race_grouping   gender count median
```

```
##    <fct>        <chr>           <chr>  <int>  <dbl>
##  1 <25          person of color Female     6   29.5
##  2 <25          white           Female     5   32
##  3 25-34        person of color Female     7   31.2
##  4 25-34        person of color Male       6   21.0
##  5 25-34        white           Female    13   30.8
##  6 25-34        white           Male       7   33.7
##  7 35-44        white           Female     7   34.7
##  8 35-44        white           Male       5   35.9
##  9 45-54        white           Female     9   44.5
## 10 55-64        white           Male       7   33.4
```

Desks

```r
current_news_median_desk_salaried <- news_salaried %>% group_by(desk)
current_news_median_desk_salaried <- current_news_median_desk_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_salaried)
```

```
## # A tibble: 18 x 3
##    desk                                    count  median
##    <chr>                                   <int>   <dbl>
##  1 National                                  106 149520.
##  2 Foreign                                    25 135000
##  3 Financial                                  38 133510.
##  4 Investigative                              13 129780
##  5 Style                                      45 107171.
##  6 Local                                      65 105780
##  7 Editorial                                  33 105000
##  8 Graphics                                   15 100780
##  9 Universal Desk                              8 100444.
## 10 Sports                                     37 100000
## 11 Outlook                                     6  99938.
## 12 Audio                                       7  92000
## 13 Design                                     45  88065.
## 14 Operations                                  6  87890
## 15 Multiplatform                              26  86104
## 16 Video                                      46  84250
## 17 Audience Development and Engagement        16  83530
## 18 Emerging News Products                     30  75000
```

```r
current_news_median_desk_hourly <- news_hourly %>% group_by(desk)
current_news_median_desk_hourly <- current_news_median_desk_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_hourly)
```

```
## # A tibble: 10 x 3
##    desk                                    count median
##    <chr>                                   <int>  <dbl>
##  1 Audio                                       6   39.7
##  2 Universal Desk                              8   38.7
```

```
##  3 Audience Development and Engagement     7   37.6
##  4 Multiplatform                          16   34.1
##  5 Editorial                               5   32.3
##  6 National                               12   31.7
##  7 Local                                   5   26.5
##  8 Style                                   9   21.8
##  9 Sports                                 11   20.9
## 10 Operations                              7   15.6
```

```
current_news_median_desk_gender_salaried <- news_salaried %>% group_by(desk, gender)
current_news_median_desk_gender_salaried <- current_news_median_desk_gender_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_gender_salaried)
```

```
## # A tibble: 31 x 4
## # Groups:   desk [17]
##    desk          gender count  median
##    <chr>         <chr>  <int>   <dbl>
##  1 National      Male      57 169780
##  2 Foreign       Male      14 145390
##  3 Editorial     Male      18 140271.
##  4 National      Female    49 139780
##  5 Financial     Male      25 136468.
##  6 Investigative Male       8 135030
##  7 Foreign       Female    11 129970.
##  8 Financial     Female    13 125000
##  9 Investigative Female     5 125000
## 10 Local         Male      31 118850
## # ... with 21 more rows
```

```
current_news_median_desk_gender_hourly <- news_hourly %>% group_by(desk, gender)
current_news_median_desk_gender_hourly <- current_news_median_desk_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_gender_hourly)
```

```
## # A tibble: 6 x 4
## # Groups:   desk [6]
##   desk           gender count median
##   <chr>          <chr>  <int>  <dbl>
## 1 Audio          Female     5   41.0
## 2 Universal Desk Female     5   35.9
## 3 Multiplatform  Female    13   34.7
## 4 Sports         Male       8   33.0
## 5 National       Female     8   32.7
## 6 Style          Female     8   26.7
```

```
current_news_median_desk_race_salaried <- news_salaried %>% group_by(desk, race_ethnicity)
current_news_median_desk_race_salaried <- current_news_median_desk_race_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_salaried)
```

```
## # A tibble: 23 x 4
## # Groups:   desk [16]
##    desk          race_ethnicity                                  count median
##    <chr>         <chr>                                           <int>  <dbl>
##  1 National      White (United States of America)                   84 1.69e5
##  2 Investigative White (United States of America)                   10 1.40e5
##  3 National      Black or African American (United States of ~      9 1.40e5
##  4 Foreign       <NA>                                               20 1.38e5
##  5 Financial     White (United States of America)                   29 1.36e5
##  6 National      Asian (United States of America)                   11 1.26e5
##  7 Editorial     White (United States of America)                   27 1.20e5
##  8 Style         White (United States of America)                   38 1.12e5
##  9 Local         White (United States of America)                   46 1.08e5
## 10 Universal De~ White (United States of America)                    5 1.04e5
## # ... with 13 more rows
```

```r
current_news_median_desk_race_hourly <- news_hourly %>% group_by(desk, race_ethnicity)
current_news_median_desk_race_hourly <- current_news_median_desk_race_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_hourly)
```

```
## # A tibble: 5 x 4
## # Groups:   desk [5]
##   desk            race_ethnicity                   count median
##   <chr>           <chr>                            <int>  <dbl>
## 1 Style           White (United States of America)     5   38.9
## 2 Universal Desk White (United States of America)     6   38.7
## 3 Multiplatform  White (United States of America)    12   36.5
## 4 Sports          White (United States of America)     9   33.0
## 5 National        White (United States of America)     9   32.7
```

```r
current_news_median_desk_race_gender_salaried <- news_salaried %>% group_by(desk, race_ethnicity, gende
current_news_median_desk_race_gender_salaried <- current_news_median_desk_race_gender_salaried %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_gender_salaried)
```

```
## # A tibble: 30 x 5
## # Groups:   desk, race_ethnicity [18]
##    desk        race_ethnicity                              gender count median
##    <chr>       <chr>                                       <chr>  <int>  <dbl>
##  1 National    White (United States of America)            Male      46 1.75e5
##  2 Investigat~ White (United States of America)            Male       6 1.49e5
##  3 Financial   White (United States of America)            Male      21 1.40e5
##  4 Editorial   White (United States of America)            Male      16 1.40e5
##  5 Foreign     <NA>                                        Male      11 1.40e5
##  6 National    White (United States of America)            Female    38 1.40e5
##  7 National    Black or African American (United State~ Male       8 1.35e5
##  8 Foreign     <NA>                                        Female     9 1.35e5
##  9 National    Asian (United States of America)            Female     8 1.33e5
## 10 Sports      White (United States of America)            Female     6 1.32e5
## # ... with 20 more rows
```

```r
current_news_median_desk_race_gender_hourly <- news_hourly %>% group_by(desk, race_ethnicity, gender)
current_news_median_desk_race_gender_hourly <- current_news_median_desk_race_gender_hourly %>% summarise
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_gender_hourly)
```

```
## # A tibble: 4 x 5
## # Groups:   desk, race_ethnicity [4]
##   desk          race_ethnicity                   gender count median
##   <chr>         <chr>                            <chr>  <int>  <dbl>
## 1 Style         White (United States of America) Female     5   38.9
## 2 Multiplatform White (United States of America) Female     9   38.4
## 3 Sports        White (United States of America) Male       7   33.0
## 4 National      White (United States of America) Female     6   32.7
```

```r
current_news_median_desk_race_group_gender_salaried <- news_salaried %>% group_by(desk, race_grouping, g
current_news_median_desk_race_group_gender_salaried <- current_news_median_desk_race_group_gender_salari
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_group_gender_salaried)
```

```
## # A tibble: 36 x 5
## # Groups:   desk, race_grouping [21]
##    desk          race_grouping   gender count  median
##    <chr>         <chr>           <chr>  <int>   <dbl>
##  1 National      white           Male      46 175374.
##  2 Investigative white           Male       6 149422.
##  3 Financial     white           Male      21 140387.
##  4 Editorial     white           Male      16 140271.
##  5 Foreign       unknown         Male      11 140000
##  6 National      white           Female    38 139734.
##  7 Foreign       unknown         Female     9 135000
##  8 National      person of color Female    10 132780
##  9 Sports        white           Female     6 132015.
## 10 National      person of color Male      11 130780
## # ... with 26 more rows
```

```r
current_news_median_desk_race_group_gender_hourly <- news_hourly %>% group_by(desk, race_grouping, gende
current_news_median_desk_race_group_gender_hourly <- current_news_median_desk_race_group_gender_hourly %
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_group_gender_hourly)
```

```
## # A tibble: 4 x 5
## # Groups:   desk, race_grouping [4]
##   desk          race_grouping gender count median
##   <chr>         <chr>         <chr>  <int>  <dbl>
## 1 Style         white         Female     5   38.9
## 2 Multiplatform white         Female     9   38.4
## 3 Sports        white         Male       7   33.0
## 4 National      white         Female     6   32.7
```

```r
current_news_median_desk_race_gender_age5_salaried <- news_salaried %>% group_by(desk, race_ethnicity, g
current_news_median_desk_race_gender_age5_salaried <- current_news_median_desk_race_gender_age5_salarie
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_gender_age5_salaried)
```

```
## # A tibble: 15 x 6
## # Groups:   desk, race_ethnicity, gender [8]
##    desk            race_ethnicity           gender age_group_5 count median
##    <chr>           <chr>                    <chr>  <fct>       <int>  <dbl>
##  1 National        White (United States of~ Male   40-44           9 1.70e5
##  2 National        White (United States of~ Male   30-34           9 1.70e5
##  3 National        White (United States of~ Female 50-54           5 1.68e5
##  4 National        White (United States of~ Female 55-59           6 1.63e5
##  5 National        White (United States of~ Female 40-44           5 1.60e5
##  6 National        White (United States of~ Male   35-39          10 1.49e5
##  7 Sports          White (United States of~ Male   35-39           7 1.47e5
##  8 Financial       White (United States of~ Male   35-39           5 1.45e5
##  9 Local           White (United States of~ Male   55-59           6 1.28e5
## 10 Foreign         <NA>                     Male   30-34           5 1.25e5
## 11 National        White (United States of~ Female 25-29           5 1.25e5
## 12 National        White (United States of~ Female 35-39           6 1.09e5
## 13 Video           White (United States of~ Female 30-34           5 8.80e4
## 14 Sports          White (United States of~ Male   45-49           5 8.73e4
## 15 Emerging News ~ White (United States of~ Female 25-29           7 7.00e4
```

```r
current_news_median_desk_race_gender_age5_hourly <- news_hourly %>% group_by(desk, race_ethnicity, gende
current_news_median_desk_race_gender_age5_hourly <- current_news_median_desk_race_gender_age5_hourly %>%
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_gender_age5_hourly)
```

```
## # A tibble: 0 x 6
## # Groups:   desk, race_ethnicity, gender [0]
## # ... with 6 variables: desk <chr>, race_ethnicity <chr>, gender <chr>,
## #   age_group_5 <fct>, count <int>, median <dbl>
```

```r
current_news_median_desk_race_group_gender_age5_salaried <- news_salaried %>% group_by(desk, race_groupi
current_news_median_desk_race_group_gender_age5_salaried <- current_news_median_desk_race_group_gender_a
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_group_gender_age5_salaried)
```

```
## # A tibble: 16 x 6
## # Groups:   desk, race_grouping, gender [9]
##    desk                  race_grouping   gender age_group_5 count  median
##    <chr>                 <chr>           <chr>  <fct>       <int>   <dbl>
##  1 National              white           Male   40-44           9 170000
##  2 National              white           Male   30-34           9 169780
##  3 National              white           Female 50-54           5 167780
##  4 National              white           Female 55-59           6 162854.
##  5 National              white           Female 40-44           5 160000
```

```
##  6 National               white          Male   35-39          10 148640
##  7 Sports                 white          Male   35-39           7 147300
##  8 Financial              white          Male   35-39           5 144755
##  9 Local                  white          Male   55-59           6 127655.
## 10 Foreign                unknown        Male   30-34           5 125000
## 11 National               white          Female 25-29           5 125000
## 12 National               white          Female 35-39           6 109390
## 13 Video                  white          Female 30-34           5  88000
## 14 Sports                 white          Male   45-49           5  87278.
## 15 Video                  person of color Female 25-29           8  76390
## 16 Emerging News Products white          Female 25-29           7  70000
```

```
current_news_median_desk_race_group_gender_age5_hourly <- news_hourly %>% group_by(desk, race_grouping,
current_news_median_desk_race_group_gender_age5_hourly <- current_news_median_desk_race_group_gender_age
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_race_group_gender_age5_hourly)
```

```
## # A tibble: 0 x 6
## # Groups:   desk, race_grouping, gender [0]
## # ... with 6 variables: desk <chr>, race_grouping <chr>, gender <chr>,
## #   age_group_5 <fct>, count <int>, median <dbl>
```

```
current_news_median_desk_tier_salaried <- news_salaried %>% group_by(tier)
current_news_median_desk_tier_salaried <- current_news_median_desk_tier_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_tier_salaried)
```

```
## # A tibble: 4 x 3
##   tier   count median
##   <chr>  <int>  <dbl>
## 1 Tier 1   182 140140
## 2 Tier 2   209 105000
## 3 Tier 3   147  85780
## 4 Tier 4    36  75000
```

```
current_news_median_desk_tier_gender_salaried <- news_salaried %>% group_by(tier, gender)
current_news_median_desk_tier_gender_salaried <- current_news_median_desk_tier_gender_salaried %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_tier_gender_salaried)
```

```
## # A tibble: 8 x 4
## # Groups:   tier [4]
##   tier   gender count  median
##   <chr>  <chr>  <int>   <dbl>
## 1 Tier 1 Male     104 150975.
## 2 Tier 1 Female    78 135160.
## 3 Tier 2 Male     112 112755.
## 4 Tier 2 Female    97  99252.
## 5 Tier 3 Male      64  90660.
## 6 Tier 3 Female    83  82010.
```

```
## 7 Tier 4 Female    26  75000
## 8 Tier 4 Male      10  74086.
```

```r
current_news_median_desk_tier_race_salaried <- news_salaried %>% group_by(tier, race_ethnicity)
current_news_median_desk_tier_race_salaried <- current_news_median_desk_tier_race_salaried %>% summarise
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_tier_race_salaried)
```

```
## # A tibble: 14 x 4
## # Groups:   tier [4]
##    tier   race_ethnicity                                       count median
##    <chr>  <chr>                                                <int>  <dbl>
##  1 Tier 1 White (United States of America)                       126 1.58e5
##  2 Tier 1 <NA>                                                    21 1.40e5
##  3 Tier 1 Black or African American (United States of America)    12 1.35e5
##  4 Tier 1 Asian (United States of America)                        17 1.25e5
##  5 Tier 2 White (United States of America)                       159 1.07e5
##  6 Tier 2 Black or African American (United States of America)    16 1.02e5
##  7 Tier 2 Asian (United States of America)                        14 9.38e4
##  8 Tier 2 Hispanic or Latino (United States of America)           11 9.21e4
##  9 Tier 2 Two or More Races (United States of America)             6 8.91e4
## 10 Tier 3 White (United States of America)                        98 8.80e4
## 11 Tier 3 Black or African American (United States of America)    17 8.57e4
## 12 Tier 3 Hispanic or Latino (United States of America)           12 8.12e4
## 13 Tier 3 Asian (United States of America)                        13 7.70e4
## 14 Tier 4 White (United States of America)                        23 7.50e4
```

```r
current_news_median_desk_tier_race_gender_salaried <- news_salaried %>% group_by(tier, race_ethnicity, g
current_news_median_desk_tier_race_gender_salaried <- current_news_median_desk_tier_race_gender_salarie
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_tier_race_gender_salaried)
```

```
## # A tibble: 23 x 5
## # Groups:   tier, race_ethnicity [13]
##    tier   race_ethnicity                                gender count median
##    <chr>  <chr>                                         <chr>  <int>  <dbl>
##  1 Tier 1 White (United States of America)              Male      74 1.66e5
##  2 Tier 1 <NA>                                          Male      11 1.40e5
##  3 Tier 1 <NA>                                          Female    10 1.38e5
##  4 Tier 1 White (United States of America)              Female    52 1.36e5
##  5 Tier 1 Black or African American (United States of ~ Male       9 1.31e5
##  6 Tier 1 Asian (United States of America)              Female    11 1.26e5
##  7 Tier 1 Asian (United States of America)              Male       6 1.22e5
##  8 Tier 2 White (United States of America)              Male      93 1.18e5
##  9 Tier 2 Hispanic or Latino (United States of America) Male       5 1.18e5
## 10 Tier 2 Black or African American (United States of ~ Male       7 1.16e5
## # ... with 13 more rows
```

```r
current_news_median_desk_tier_race_group_gender_salaried <- news_salaried %>% group_by(tier, race_groupi
current_news_median_desk_tier_race_group_gender_salaried <- current_news_median_desk_tier_race_group_gen
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
```

```
)
suppress_median(current_news_median_desk_tier_race_group_gender_salaried)
```

```
## # A tibble: 17 x 5
## # Groups:   tier, race_grouping [9]
##    tier   race_grouping   gender count  median
##    <chr>  <chr>           <chr>  <int>   <dbl>
##  1 Tier 1 white           Male      74 166149.
##  2 Tier 1 unknown         Male      14 137890
##  3 Tier 1 unknown         Female    10 137640
##  4 Tier 1 white           Female    52 135825.
##  5 Tier 1 person of color Male      16 127890
##  6 Tier 1 person of color Female    16 125390
##  7 Tier 2 white           Male      93 117844.
##  8 Tier 2 person of color Male      19 105000
##  9 Tier 2 white           Female    66 102424.
## 10 Tier 2 person of color Female    30  93020.
## 11 Tier 3 white           Male      43  92500
## 12 Tier 3 person of color Male      19  85692.
## 13 Tier 3 white           Female    55  84780
## 14 Tier 3 person of color Female    27  79161.
## 15 Tier 4 person of color Female    10  78500
## 16 Tier 4 white           Male       8  75500
## 17 Tier 4 white           Female    15  75000
```

```
current_news_median_desk_tier_race_gender_age5_salaried <- news_salaried %>% group_by(tier, race_ethnic
current_news_median_desk_tier_race_gender_age5_salaried <- current_news_median_desk_tier_race_gender_age
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_tier_race_gender_age5_salaried)
```

```
## # A tibble: 42 x 6
## # Groups:   tier, race_ethnicity, gender [9]
##    tier   race_ethnicity                   gender age_group_5 count  median
##    <chr>  <chr>                            <chr>  <fct>       <int>   <dbl>
##  1 Tier 1 White (United States of America) Male   50-54           5 180040
##  2 Tier 1 White (United States of America) Male   60-64           6 170790.
##  3 Tier 1 White (United States of America) Male   40-44          15 166999.
##  4 Tier 1 White (United States of America) Female 45-49           5 165000
##  5 Tier 1 White (United States of America) Female 55-59           6 162854.
##  6 Tier 1 White (United States of America) Male   55-59           9 160780
##  7 Tier 2 White (United States of America) Female 55-59           5 149030.
##  8 Tier 2 White (United States of America) Male   65+             6 147473.
##  9 Tier 2 White (United States of America) Male   55-59          16 147161.
## 10 Tier 1 White (United States of America) Female 50-54           8 146280
## # ... with 32 more rows
```

```
current_news_median_desk_tier_race_group_gender_age5_salaried <- news_salaried %>% group_by(tier, race_g
current_news_median_desk_tier_race_group_gender_age5_salaried <- current_news_median_desk_tier_race_grou
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_desk_tier_race_group_gender_age5_salaried)
```

```
## # A tibble: 49 x 6
## # Groups:   tier, race_grouping, gender [14]
##    tier   race_grouping gender age_group_5 count  median
##    <chr>  <chr>         <chr>  <fct>       <int>   <dbl>
##  1 Tier 1 white         Male   50-54           5 180040
##  2 Tier 1 white         Male   60-64           6 170790.
##  3 Tier 1 white         Male   40-44          15 166999.
##  4 Tier 1 white         Female 45-49           5 165000
##  5 Tier 1 white         Female 55-59           6 162854.
##  6 Tier 1 white         Male   55-59           9 160780
##  7 Tier 2 white         Female 55-59           5 149030.
##  8 Tier 2 white         Male   65+             6 147473.
##  9 Tier 2 white         Male   55-59          16 147161.
## 10 Tier 1 white         Female 50-54           8 146280
## # ... with 39 more rows
```

Job profiles

```r
current_news_median_job_salaried <- news_salaried %>% group_by(job_profile_current)
current_news_median_job_salaried <- current_news_median_job_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_salaried)
```

```
## # A tibble: 18 x 3
##    job_profile_current            count  median
##    <chr>                          <int>   <dbl>
##  1 300113 - Columnist                19 170497.
##  2 300313 - Columnist - Editorial     7 151896.
##  3 320113 - Critic                    9 150962.
##  4 330113 - Editorial Writer          7 129236.
##  5 280212 - Staff Writer            306 124040
##  6 390510 - Graphics Editor           7 111071
##  7 360114 - Photographer             16 106015.
##  8 126902 - Topic Editor              6 103772.
##  9 390610 - Graphics Reporter         8  97280
## 10 120602 - Operations Editor         7  90780
## 11 280226 - Video Journalist         20  89240
## 12 390310 - Video Graphics Editor     8  87280
## 13 120202 - Assistant Editor         23  87000
## 14 390110 - Multiplatform Editor     53  83147.
## 15 280228 - Designer                 29  76000
## 16 126202 - Photo Editor              8  74962.
## 17 390410 - Digital Video Editor     22  74500
## 18 289711 - News Intern - 2 Year      5  65780
```

```r
current_news_median_job_hourly <- news_hourly %>% group_by(job_profile_current)
current_news_median_job_hourly <- current_news_median_job_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_hourly)
```

```
## # A tibble: 7 x 3
```

```
##   job_profile_current                       count median
##   <chr>                                     <int>  <dbl>
## 1 280225 - Producer                            18   36.7
## 2 400151 - Administrative Aide                  6   35.3
## 3 397110 - Multiplatform Editor (PT/PTOC)      23   34.7
## 4 380117 - Research Assistant                   6   31.2
## 5 410251 - Editorial Aide                      12   21.4
## 6 430117 - News Aide                            8   17.1
## 7 440116 - Copy Aide                            5   15.2
```

```r
current_news_median_job_gender_salaried <- news_salaried %>% group_by(job_profile_current, gender)
current_news_median_job_gender_salaried <- current_news_median_job_gender_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_gender_salaried)
```

```
## # A tibble: 23 x 4
## # Groups:   job_profile_current [15]
##    job_profile_current            gender count  median
##    <chr>                          <chr>  <int>   <dbl>
##  1 300113 - Columnist             Male       8 175984.
##  2 330113 - Editorial Writer      Male       5 164900.
##  3 320113 - Critic                Male       5 160780
##  4 300113 - Columnist             Female    11 154780
##  5 300313 - Columnist - Editorial Male       5 151896.
##  6 280212 - Staff Writer          Male     170 128440.
##  7 280212 - Staff Writer          Female   136 113474.
##  8 390510 - Graphics Editor       Male       5 111071
##  9 360114 - Photographer          Male      11 109928.
## 10 280226 - Video Journalist      Male       8  98555
## # ... with 13 more rows
```

```r
current_news_median_job_gender_hourly <- news_hourly %>% group_by(job_profile_current, gender)
current_news_median_job_gender_hourly <- current_news_median_job_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_gender_hourly)
```

```
## # A tibble: 7 x 4
## # Groups:   job_profile_current [5]
##   job_profile_current                       gender count median
##   <chr>                                     <chr>  <int>  <dbl>
## 1 280225 - Producer                         Male       6   36.7
## 2 397110 - Multiplatform Editor (PT/PTOC) Female    14   36.5
## 3 280225 - Producer                         Female    12   36.4
## 4 400151 - Administrative Aide              Female     6   35.3
## 5 397110 - Multiplatform Editor (PT/PTOC) Male       9   33.4
## 6 380117 - Research Assistant               Female     5   31.7
## 7 410251 - Editorial Aide                   Female     8   21.4
```

```r
current_news_median_job_race_salaried <- news_salaried %>% group_by(job_profile_current, race_ethnicity)
current_news_median_job_race_salaried <- current_news_median_job_race_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
```

```
)
suppress_median(current_news_median_job_race_salaried)
```

```
## # A tibble: 21 x 4
## # Groups:   job_profile_current [14]
##    job_profile_current      race_ethnicity                            count median
##    <chr>                    <chr>                                     <int>  <dbl>
##  1 300313 - Columnist - Ed~ White (United States of America)              6 1.91e5
##  2 300113 - Columnist       White (United States of America)             13 1.77e5
##  3 300113 - Columnist       Black or African American (United~            5 1.53e5
##  4 320113 - Critic          White (United States of America)              8 1.49e5
##  5 280212 - Staff Writer    <NA>                                         21 1.40e5
##  6 330113 - Editorial Writ~ White (United States of America)              6 1.27e5
##  7 280212 - Staff Writer    White (United States of America)            223 1.25e5
##  8 280212 - Staff Writer    Black or African American (United~           18 1.22e5
##  9 280212 - Staff Writer    Asian (United States of America)             24 1.17e5
## 10 390510 - Graphics Editor White (United States of America)              5 1.11e5
## # ... with 11 more rows
```

```
current_news_median_job_race_hourly <- news_hourly %>% group_by(job_profile_current, race_ethnicity)
current_news_median_job_race_hourly <- current_news_median_job_race_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_hourly)
```

```
## # A tibble: 6 x 4
## # Groups:   job_profile_current [5]
##   job_profile_current         race_ethnicity                       count median
##   <chr>                       <chr>                                <int>  <dbl>
## 1 280225 - Producer           Black or African American (Unit~         5   37.6
## 2 280225 - Producer           White (United States of America)         8   35.9
## 3 397110 - Multiplatform Edi~ White (United States of America)        18   34.8
## 4 380117 - Research Assistant White (United States of America)         5   31.7
## 5 410251 - Editorial Aide     White (United States of America)         7   21.1
## 6 430117 - News Aide          White (United States of America)         5   16.5
```

```
current_news_median_job_race_gender_salaried <- news_salaried %>% group_by(job_profile_current, race_etl
current_news_median_job_race_gender_salaried <- current_news_median_job_race_gender_salaried %>% summar
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_gender_salaried)
```

```
## # A tibble: 23 x 5
## # Groups:   job_profile_current, race_ethnicity [13]
##    job_profile_current race_ethnicity                     gender count median
##    <chr>               <chr>                              <chr>  <int>  <dbl>
##  1 300113 - Columnist  White (United States of America) Female      7 2.24e5
##  2 300113 - Columnist  White (United States of America) Male        6 1.76e5
##  3 320113 - Critic     White (United States of America) Male        5 1.61e5
##  4 280212 - Staff Wri~ <NA>                               Male       11 1.40e5
##  5 280212 - Staff Wri~ <NA>                               Female     10 1.38e5
##  6 280212 - Staff Wri~ White (United States of America) Male      130 1.29e5
##  7 280212 - Staff Wri~ Black or African American (Unit~ Male       13 1.25e5
```

```
##  8 280212 - Staff Wri~ Asian (United States of America) Male       9 1.19e5
##  9 280212 - Staff Wri~ Asian (United States of America) Female    15 1.15e5
## 10 280212 - Staff Wri~ White (United States of America) Female    93 1.15e5
## # ... with 13 more rows
```

```
current_news_median_job_race_gender_hourly <- news_hourly %>% group_by(job_profile_current, race_ethnici
current_news_median_job_race_gender_hourly <- current_news_median_job_race_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_gender_hourly)
```

```
## # A tibble: 4 x 5
## # Groups:   job_profile_current, race_ethnicity [3]
##   job_profile_current           race_ethnicity          gender count median
##   <chr>                         <chr>                   <chr>  <int>  <dbl>
## 1 397110 - Multiplatform Edito~ White (United States o~ Female    10   39.9
## 2 280225 - Producer             White (United States o~ Female     5   34.2
## 3 397110 - Multiplatform Edito~ White (United States o~ Male       8   33.4
## 4 410251 - Editorial Aide       White (United States o~ Female     5   21.1
```

```
current_news_median_job_race_group_gender_salaried <- news_salaried %>% group_by(job_profile_current, ra
current_news_median_job_race_group_gender_salaried <- current_news_median_job_race_group_gender_salarie
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_group_gender_salaried)
```

```
## # A tibble: 27 x 5
## # Groups:   job_profile_current, race_grouping [16]
##    job_profile_current       race_grouping   gender count  median
##    <chr>                     <chr>           <chr>  <int>   <dbl>
##  1 300113 - Columnist        white           Female     7 224461.
##  2 300113 - Columnist        white           Male       6 175984.
##  3 320113 - Critic           white           Male       5 160780
##  4 280212 - Staff Writer     unknown         Male      14 137890
##  5 280212 - Staff Writer     unknown         Female    11 135000
##  6 280212 - Staff Writer     white           Male     130 129280
##  7 280212 - Staff Writer     person of color Male      26 124540
##  8 280212 - Staff Writer     white           Female    93 115000
##  9 360114 - Photographer     white           Male       7 113757.
## 10 280226 - Video Journalist white           Male       6 106500
## # ... with 17 more rows
```

```
current_news_median_job_race_group_gender_hourly <- news_hourly %>% group_by(job_profile_current, race_g
current_news_median_job_race_group_gender_hourly <- current_news_median_job_race_group_gender_hourly %>%
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_group_gender_hourly)
```

```
## # A tibble: 5 x 5
## # Groups:   job_profile_current, race_grouping [4]
##   job_profile_current                     race_grouping gender count median
##   <chr>                                   <chr>         <chr>  <int>  <dbl>
## 1 397110 - Multiplatform Editor (PT/PTO~ white          Female    10   39.9
```

```
## 2 280225 - Producer                       person of col~ Female     6   35.9
## 3 280225 - Producer                       white          Female     5   34.2
## 4 397110 - Multiplatform Editor (PT/PTO~ white          Male       8   33.4
## 5 410251 - Editorial Aide                 white          Female     5   21.1
```

```
current_news_median_job_race_gender_age5_salaried <- news_salaried %>% group_by(job_profile_current, rac
current_news_median_job_race_gender_age5_salaried <- current_news_median_job_race_gender_age5_salaried %
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_gender_age5_salaried)
```

```
## # A tibble: 25 x 6
## # Groups:   job_profile_current, race_ethnicity, gender [7]
##    job_profile_curre~ race_ethnicity        gender age_group_5 count median
##    <chr>              <chr>                 <chr>  <fct>       <int>  <dbl>
##  1 280212 - Staff Wr~ White (United States~ Male   65+             5 1.59e5
##  2 280212 - Staff Wr~ White (United States~ Male   55-59          17 1.54e5
##  3 280212 - Staff Wr~ White (United States~ Female 55-59           7 1.54e5
##  4 280212 - Staff Wr~ White (United States~ Female 45-49          10 1.45e5
##  5 280212 - Staff Wr~ White (United States~ Female 40-44           9 1.40e5
##  6 280212 - Staff Wr~ White (United States~ Male   60-64          11 1.35e5
##  7 280212 - Staff Wr~ White (United States~ Male   40-44          20 1.33e5
##  8 280212 - Staff Wr~ White (United States~ Male   50-54          14 1.32e5
##  9 280212 - Staff Wr~ White (United States~ Male   45-49           9 1.31e5
## 10 280212 - Staff Wr~ White (United States~ Female 60-64           6 1.28e5
## # ... with 15 more rows
```

```
current_news_median_job_race_gender_age5_hourly <- news_hourly %>% group_by(job_profile_current, race_et
current_news_median_job_race_gender_age5_hourly <- current_news_median_job_race_gender_age5_hourly %>% s
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_gender_age5_hourly)
```

```
## # A tibble: 0 x 6
## # Groups:   job_profile_current, race_ethnicity, gender [0]
## # ... with 6 variables: job_profile_current <chr>, race_ethnicity <chr>,
## #   gender <chr>, age_group_5 <fct>, count <int>, median <dbl>
```

```
current_news_median_job_race_group_gender_age5_salaried <- news_salaried %>% group_by(job_profile_curren
current_news_median_job_race_group_gender_age5_salaried <- current_news_median_job_race_group_gender_age
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_group_gender_age5_salaried)
```

```
## # A tibble: 29 x 6
## # Groups:   job_profile_current, race_grouping, gender [9]
##    job_profile_current   race_grouping gender age_group_5 count  median
##    <chr>                 <chr>         <chr>  <fct>       <int>   <dbl>
##  1 280212 - Staff Writer white         Male   65+             5 159458.
##  2 280212 - Staff Writer white         Male   55-59          17 153923.
##  3 280212 - Staff Writer white         Female 55-59           7 153780
##  4 280212 - Staff Writer white         Female 45-49          10 144560.
##  5 280212 - Staff Writer white         Female 40-44           9 140000
```

```
##   6 280212 - Staff Writer white         Male   60-64          11 134957.
##   7 280212 - Staff Writer white         Male   40-44          20 132980.
##   8 280212 - Staff Writer white         Male   50-54          14 132273.
##   9 280212 - Staff Writer white         Male   45-49           9 130845
##  10 280212 - Staff Writer white         Female 60-64           6 128441.
## # ... with 19 more rows
```

```
current_news_median_job_race_group_gender_age5_hourly <- news_hourly %>% group_by(job_profile_current, r
current_news_median_job_race_group_gender_age5_hourly <- current_news_median_job_race_group_gender_age5_
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_news_median_job_race_group_gender_age5_hourly)
```

```
## # A tibble: 0 x 6
## # Groups:   job_profile_current, race_grouping, gender [0]
## # ... with 6 variables: job_profile_current <chr>, race_grouping <chr>,
## #   gender <chr>, age_group_5 <fct>, count <int>, median <dbl>
```

Performance evaluations

```
news_ratings <- filter(ratings_combined, dept == 'News')

news_ratings_gender <- news_ratings %>% group_by(gender)
news_ratings_gender <- news_ratings_gender %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating)
)
suppress_median(news_ratings_gender)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female  1892     NA
## 2 Male    1772     NA
```

```
news_ratings_race <- news_ratings %>% group_by(race_ethnicity)
news_ratings_race <- news_ratings_race %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress_median(news_ratings_race)
```

```
## # A tibble: 9 x 3
##   race_ethnicity                                                count median
##   <chr>                                                         <int>  <dbl>
## 1 American Indian or Alaska Native (United States of America)     12    3.6
## 2 <NA>                                                            88    3.6
## 3 White (United States of America)                              2516    3.5
## 4 Asian (United States of America)                               324    3.4
## 5 Prefer Not to Disclose (United States of America)               56    3.4
## 6 Black or African American (United States of America)           416    3.3
## 7 Hispanic or Latino (United States of America)                  164    3.3
## 8 Native Hawaiian or Other Pacific Islander (United States of~     8    3.3
## 9 Two or More Races (United States of America)                    80    3.2
```

```r
news_ratings_race_gender <- news_ratings %>% group_by(race_ethnicity, gender)
news_ratings_race_gender <- news_ratings_race_gender %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(news_ratings_race_gender)
```

```
## # A tibble: 16 x 4
## # Groups:   race_ethnicity [9]
##    race_ethnicity                                        gender count median
##    <chr>                                                 <chr>  <int>  <dbl>
##  1 American Indian or Alaska Native (United States of ~ Female     8   3.7
##  2 Asian (United States of America)                      Female   232   3.4
##  3 Asian (United States of America)                      Male      92   3.4
##  4 Black or African American (United States of America) Female   224   3.25
##  5 Black or African American (United States of America) Male     192   3.3
##  6 Hispanic or Latino (United States of America)         Female    80   3.3
##  7 Hispanic or Latino (United States of America)         Male      84   3.3
##  8 Native Hawaiian or Other Pacific Islander (United S~ Male       8   3.3
##  9 Prefer Not to Disclose (United States of America)    Female    24   3.5
## 10 Prefer Not to Disclose (United States of America)    Male      32   3.3
## 11 Two or More Races (United States of America)         Female    52   3.2
## 12 Two or More Races (United States of America)         Male      28   3.2
## 13 White (United States of America)                      Female  1228   3.4
## 14 White (United States of America)                      Male    1288   3.5
## 15 <NA>                                                  Female    44   3.7
## 16 <NA>                                                  Male      44   3.55
```

```r
news_ratings_race_gender_under3 <- filter(news_ratings, performance_rating < 3.1) %>% group_by(race_grou
news_ratings_race_gender_under3 <- news_ratings_race_gender_under3 %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(news_ratings_race_gender_under3)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female    57      3
## 2 person of color Male      49      3
## 3 white           Female    92      3
## 4 white           Male      80      3
```

```r
news_ratings_race_gender_over4 <- filter(news_ratings, performance_rating > 3.9) %>% group_by(race_group
news_ratings_race_gender_over4 <- news_ratings_race_gender_over4 %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(news_ratings_race_gender_over4)
```

```
## # A tibble: 6 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
```

```
## 1 person of color Female    13   4.1
## 2 person of color Male       5   4.1
## 3 unknown         Female     5   4.1
## 4 unknown         Male      10   4.05
## 5 white           Female    67   4.1
## 6 white           Male     114   4.2
```

Pay changes

```
news_change <- filter(reason_for_change_combined, dept == 'News')

news_change_gender <- news_change %>% group_by(business_process_reason, gender)
news_change_gender %>% summarise(
  count = length(business_process_reason)
)
```

```
## # A tibble: 37 x 3
## # Groups:   business_process_reason [19]
##    business_process_reason                      gender count
##    <chr>                                        <chr>  <int>
##  1 Data Change > Data Change > Change Job Details Female   282
##  2 Data Change > Data Change > Change Job Details Male     245
##  3 Hire Employee > New Hire > Conversion          Female     1
##  4 Hire Employee > New Hire > Conversion          Male       1
##  5 Hire Employee > New Hire > Convert Contingent  Female     4
##  6 Hire Employee > New Hire > Convert Contingent  Male       1
##  7 Hire Employee > New Hire > Fill Vacancy        Female    70
##  8 Hire Employee > New Hire > Fill Vacancy        Male      55
##  9 Hire Employee > New Hire > New Position        Female    78
## 10 Hire Employee > New Hire > New Position        Male      58
## # ... with 27 more rows
```

```
news_change_race <- news_change %>% group_by(business_process_reason, race_ethnicity)
news_change_race <- news_change_race %>% summarise(
  count = length(business_process_reason)
)
suppress_count(news_change_race)
```

```
## # A tibble: 70 x 3
## # Groups:   business_process_reason [14]
##    business_process_reason           race_ethnicity                  count
##    <chr>                             <chr>                           <int>
##  1 <NA>                              White (United States of Ameri~  7232
##  2 <NA>                              Black or African American (Un~  1167
##  3 Request Compensation Change > Adju~ White (United States of Ameri~  1164
##  4 <NA>                              Asian (United States of Ameri~   918
##  5 Merit > Performance > Annual Perfo~ White (United States of Ameri~   889
##  6 <NA>                              Hispanic or Latino (United St~   484
##  7 Data Change > Data Change > Change~ White (United States of Ameri~   345
##  8 <NA>                              Two or More Races (United Sta~   274
##  9 <NA>                              <NA>                              207
## 10 Transfer > Transfer > Move to anot~ White (United States of Ameri~   201
## # ... with 60 more rows
```

```r
news_change_race_gender <- news_change %>% group_by(business_process_reason, race_ethnicity, gender)
news_change_race_gender <- news_change_race_gender %>% summarise(
  count = length(business_process_reason)
)
suppress_count(news_change_race_gender)
```

```
## # A tibble: 107 x 4
## # Groups:   business_process_reason, race_ethnicity [62]
##    business_process_reason          race_ethnicity             gender count
##    <chr>                            <chr>                      <chr>  <int>
##  1 <NA>                             White (United States of A~ Male    3680
##  2 <NA>                             White (United States of A~ Female  3552
##  3 <NA>                             Asian (United States of A~ Female   702
##  4 <NA>                             Black or African American~ Female   612
##  5 Request Compensation Change > A~ White (United States of A~ Male     606
##  6 Request Compensation Change > A~ White (United States of A~ Female   558
##  7 <NA>                             Black or African American~ Male     555
##  8 Merit > Performance > Annual Pe~ White (United States of A~ Male     476
##  9 Merit > Performance > Annual Pe~ White (United States of A~ Female   413
## 10 <NA>                             Hispanic or Latino (Unite~ Female   250
## # ... with 97 more rows
```

Performance evaluations x merit raises

```r
reason_for_change_combined <- reason_for_change_combined %>% mutate(merit_raises = grepl('*Merit*', busi
twenty14 = as.Date('2016-04-01')
twenty15 = as.Date('2017-04-01')
twenty16 = as.Date('2018-04-01')
twenty17 = as.Date('2019-04-01')
twenty18 = as.Date('2020-04-01')

reason_for_change_combined <- reason_for_change_combined %>%
    mutate(raise_after=case_when(
    effective_date < twenty14 ~ 'before 2015',
    effective_date < twenty15 ~ '2015',
    effective_date < twenty16 ~ '2016',
    effective_date < twenty17 ~ '2017',
    effective_date < twenty18 ~ '2018',
    TRUE ~ 'Other'))

merit_raises_news_gender_salaried <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'I
merit_raises_news_gender_salaried <- merit_raises_news_gender_salaried %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress(merit_raises_news_gender_salaried)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female   431   3000
## 2 Male     494   3000
```

```r
merit_raises_news_gender_hourly <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Ne
merit_raises_news_gender_hourly <- merit_raises_news_gender_hourly %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress(merit_raises_news_gender_hourly)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    78   1.27
## 2 Male      51   1.03
```

```r
merit_raises_news_race_salaried <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Ne
merit_raises_news_race_salaried <- merit_raises_news_race_salaried %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_news_race_salaried)
```

```
## # A tibble: 7 x 3
##   race_ethnicity                                                count median
##   <chr>                                                         <int>  <dbl>
## 1 American Indian or Alaska Native (United States of America)     5   3500
## 2 Two or More Races (United States of America)                    7   3500
## 3 <NA>                                                           14   3500
## 4 Asian (United States of America)                               69   3000
## 5 Black or African American (United States of America)           82   3000
## 6 White (United States of America)                              707   3000
## 7 Hispanic or Latino (United States of America)                  36   2500
```

```r
merit_raises_news_race_hourly <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News
merit_raises_news_race_hourly <- merit_raises_news_race_hourly %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_news_race_hourly)
```

```
## # A tibble: 3 x 3
##   race_ethnicity                                         count median
##   <chr>                                                  <int>  <dbl>
## 1 White (United States of America)                          91   1.28
## 2 Black or African American (United States of America)     16   1.25
## 3 Asian (United States of America)                          18   1.03
```

```r
merit_raises_news_race_group_salaried <- filter(reason_for_change_combined, merit_raises == TRUE, dept =
merit_raises_news_race_group_salaried <- merit_raises_news_race_group_salaried %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_news_race_group_salaried)
```

```
## # A tibble: 3 x 3
##   race_grouping   count median
##   <chr>           <int>  <dbl>
## 1 person of color   200   3000
```

```
## 2 white              707   3000
## 3 unknown             18   2860
```

```
merit_raises_news_race_group_hourly <- filter(reason_for_change_combined, merit_raises == TRUE, dept ==
merit_raises_news_race_group_hourly <- merit_raises_news_race_group_hourly %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_news_race_group_hourly)
```

```
## # A tibble: 2 x 3
##   race_grouping   count median
##   <chr>           <int>  <dbl>
## 1 white              91   1.28
## 2 person of color    38   1.03
```

```
merit_raises_news_gender_race_group_salaried <- filter(reason_for_change_combined, merit_raises == TRUE
merit_raises_news_gender_race_group_salaried <- merit_raises_news_gender_race_group_salaried %>% summari
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_news_gender_race_group_salaried)
```

```
## # A tibble: 6 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 unknown         Female    10  3500
## 2 person of color Female   112  3000
## 3 white           Female   309  3000
## 4 white           Male     398  3000
## 5 person of color Male      88  2900
## 6 unknown         Male       8  2458.
```

```
merit_raises_news_gender_race_group_hourly <- filter(reason_for_change_combined, merit_raises == TRUE, d
merit_raises_news_gender_race_group_hourly <- merit_raises_news_gender_race_group_hourly %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_news_gender_race_group_hourly)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 white           Female    59   1.28
## 2 person of color Female    19   1.26
## 3 person of color Male      19   1.03
## 4 white           Male      32   1.02
```

```
fifteen_raises_amount <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News', pay_ra
fifteen_raises_amount <- fifteen_raises_amount %>% summarise(
  count = length(base_pay_change),
  median_raise = median(base_pay_change, na.rm = TRUE)
)
suppress(fifteen_raises_amount)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median_raise
##   <chr>           <chr>  <int>        <dbl>
## 1 person of color Female    17        2888
## 2 person of color Male      10        2162.
## 3 white           Female    44        2500
## 4 white           Male      64        3000
```

```
fifteen_raises_score <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News', pay_ra
fifteen_raises_score <- fifteen_raises_score %>% summarise(
  count = length('2015_annual_performance_rating'),
  median = median('2015_annual_performance_rating', na.rm = TRUE)
)
suppress(fifteen_raises_score)
```

```
## # A tibble: 0 x 4
## # Groups:   race_grouping [0]
## # ... with 4 variables: race_grouping <chr>, gender <chr>, count <int>,
## #   median <chr>
```

```
sixteen_raises_amount <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News', pay_ra
sixteen_raises_amount <- sixteen_raises_amount %>% summarise(
  count = length(base_pay_change),
  median_raise = median(base_pay_change, na.rm = TRUE)
)
suppress(sixteen_raises_amount)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median_raise
##   <chr>           <chr>  <int>        <dbl>
## 1 person of color Female    26         3000
## 2 person of color Male      17         3000
## 3 white           Female    60         3000
## 4 white           Male      81         3000
```

```
sixteen_raises_score <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News', pay_ra
sixteen_raises_score <- sixteen_raises_score %>% summarise(
  count = length('2016_annual_performance_rating'),
  median = median('2016_annual_performance_rating', na.rm = TRUE)
)
suppress(sixteen_raises_score)
```

```
## # A tibble: 0 x 4
## # Groups:   race_grouping [0]
## # ... with 4 variables: race_grouping <chr>, gender <chr>, count <int>,
## #   median <chr>
```

```
seventeen_raises_amount <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News', pay
seventeen_raises_amount <- seventeen_raises_amount %>% summarise(
  count = length(base_pay_change),
  median_raise = median(base_pay_change, na.rm = TRUE)
)
suppress(seventeen_raises_amount)
```

```
## # A tibble: 4 x 4
```

```
## # Groups:   race_grouping [2]
##   race_grouping   gender count median_raise
##   <chr>           <chr>  <int>        <dbl>
## 1 person of color Female    25         3000
## 2 person of color Male      25         3000
## 3 white           Female    59         2500
## 4 white           Male      89         3000
```

```
seventeen_raises_score <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News', pay_r
seventeen_raises_score <- seventeen_raises_score %>% summarise(
  count = length('2017_annual_performance_rating'),
  median = median('2017_annual_performance_rating', na.rm = TRUE)
)
suppress(seventeen_raises_score)
```

```
## # A tibble: 0 x 4
## # Groups:   race_grouping [0]
## # ... with 4 variables: race_grouping <chr>, gender <chr>, count <int>,
## #   median <chr>
```

```
eighteen_raises_amount <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News', pay_r
eighteen_raises_amount <- eighteen_raises_amount %>% summarise(
  count = length(base_pay_change),
  median_raise = median(base_pay_change, na.rm = TRUE)
)
suppress(eighteen_raises_amount)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median_raise
##   <chr>           <chr>  <int>        <dbl>
## 1 person of color Female    28         3000
## 2 person of color Male      26         2500
## 3 white           Female   104         3000
## 4 white           Male     120         3000
```

```
eighteen_raises_score <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'News', pay_ra
eighteen_raises_score <- eighteen_raises_score %>% summarise(
  count = length('2018_annual_performance_rating'),
  median = median('2018_annual_performance_rating', na.rm = TRUE)
)
suppress(eighteen_raises_score)
```

```
## # A tibble: 0 x 4
## # Groups:   race_grouping [0]
## # ... with 4 variables: race_grouping <chr>, gender <chr>, count <int>,
## #   median <chr>
```

```
merit_raises_15 <- filter(reason_for_change_combined, raise_after == '2015', merit_raises == TRUE)
merit_raises_16 <- filter(reason_for_change_combined, raise_after == '2016', merit_raises == TRUE)
merit_raises_17 <- filter(reason_for_change_combined, raise_after == '2017', merit_raises == TRUE)
merit_raises_18 <- filter(reason_for_change_combined, raise_after == '2018', merit_raises == TRUE)

merit_raises_15 <- merit_raises_15[,c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_
merit_raises_16 <- merit_raises_16[,c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_
merit_raises_17 <- merit_raises_17[,c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_
merit_raises_18 <- merit_raises_18[,c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_
```

```
names(merit_raises_15) <- c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping'
names(merit_raises_16) <- c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping'
names(merit_raises_17) <- c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping'
names(merit_raises_18) <- c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping'

merit_raises_combined <- rbind(merit_raises_15, merit_raises_16, merit_raises_17, merit_raises_18)

news_salaried_raises <- filter(merit_raises_combined, pay_rate_type == 'Salaried', dept == 'News') %>% g
news_salaried_raises <- news_salaried_raises %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress(news_salaried_raises)
```

```
## # A tibble: 6 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female    96  3000
## 2 person of color Male      78  2659.
## 3 unknown         Female     9  3000
## 4 unknown         Male       7  2500
## 5 white           Female   267  3000
## 6 white           Male     354  3000
```

```
news_salaried_raises_scores <- filter(merit_raises_combined, pay_rate_type == 'Salaried', dept == 'News
news_salaried_raises_scores <- news_salaried_raises_scores %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(news_salaried_raises_scores)
```

```
## # A tibble: 6 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female    96    3.4
## 2 person of color Male      78    3.4
## 3 unknown         Female     9    3.9
## 4 unknown         Male       7    3.7
## 5 white           Female   267    3.5
## 6 white           Male     354    3.6
```

```
news_hourly_raises <- filter(merit_raises_combined, pay_rate_type == 'Hourly', dept == 'News') %>% grou
news_hourly_raises <- news_hourly_raises %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress(news_hourly_raises)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female    18   1.27
```

```
## 2 person of color Male      19   1.03
## 3 white           Female    54   1.46
## 4 white           Male      28   1.16
```

```
news_hourly_raises_scores <- filter(merit_raises_combined, pay_rate_type == 'Hourly', dept == 'News') %
news_hourly_raises_scores <- news_hourly_raises_scores %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(news_hourly_raises_scores)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female    18    3.4
## 2 person of color Male      19    3.4
## 3 white           Female    54    3.5
## 4 white           Male      28    3.6
```

Era

```
bezos <- filter(news_salaried, hire_date > '2013-10-04')
graham <- filter(news_salaried, hire_date < '2013-10-05')

bezos_gender <- bezos %>% group_by(gender)
bezos_gender <- bezos_gender %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(bezos_gender)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Male     157 100780
## 2 Female   180  87160
```

```
graham_gender <- graham %>% group_by(gender)
graham_gender <- graham_gender %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(graham_gender)
```

```
## # A tibble: 2 x 3
##   gender count  median
##   <chr>  <int>   <dbl>
## 1 Male     133 127059.
## 2 Female   104 112136.
```

```
bezos_race <- bezos %>% group_by(race_ethnicity)
bezos_race <- bezos_race %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
```

```r
suppress_median(bezos_race)
```

```
## # A tibble: 7 x 3
##   race_ethnicity                                          count  median
##   <chr>                                                   <int>   <dbl>
## 1 <NA>                                                       12 130000
## 2 Black or African American (United States of America)     26  94964.
## 3 White (United States of America)                          224  94519.
## 4 Asian (United States of America)                           31  87000
## 5 Prefer Not to Disclose (United States of America)          8  82140
## 6 Hispanic or Latino (United States of America)              22  81250.
## 7 Two or More Races (United States of America)               14  79860
```

```r
graham_race <- graham %>% group_by(race_ethnicity)
graham_race <- graham_race %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(graham_race)
```

```
## # A tibble: 5 x 3
##   race_ethnicity                                          count  median
##   <chr>                                                   <int>   <dbl>
## 1 <NA>                                                        9 151171.
## 2 Hispanic or Latino (United States of America)               6 135272.
## 3 White (United States of America)                          182 124500
## 4 Asian (United States of America)                           15 111761.
## 5 Black or African American (United States of America)     22 104398.
```

```r
bezos_race_group <- bezos %>% group_by(race_grouping)
bezos_race_group <- bezos_race_group %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(bezos_race_group)
```

```
## # A tibble: 3 x 3
##   race_grouping   count  median
##   <chr>           <int>   <dbl>
## 1 unknown            20 113890
## 2 white             224  94519.
## 3 person of color    93  86000
```

```r
graham_race_group <- graham %>% group_by(race_grouping)
graham_race_group <- graham_race_group %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(graham_race_group)
```

```
## # A tibble: 3 x 3
##   race_grouping   count  median
##   <chr>           <int>   <dbl>
## 1 unknown             9 151171.
## 2 white             182 124500
## 3 person of color    46 110845.
```

```
bezos_gender_race_group <- bezos %>% group_by(race_grouping, gender)
bezos_gender_race_group <- bezos_gender_race_group %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(bezos_gender_race_group)
```

```
## # A tibble: 6 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count  median
##   <chr>           <chr>  <int>   <dbl>
## 1 unknown         Male      10 121390
## 2 unknown         Female    10 109000
## 3 white           Male     115 102780
## 4 person of color Male      32  94026.
## 5 white           Female   109  88780
## 6 person of color Female    61  82000
```

```
graham_gender_race_group <- graham %>% group_by(race_grouping, gender)
graham_gender_race_group <- graham_gender_race_group %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(graham_gender_race_group)
```

```
## # A tibble: 5 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count  median
##   <chr>           <chr>  <int>   <dbl>
## 1 unknown         Male       6 150975.
## 2 white           Male     103 128629.
## 3 person of color Male      24 117567.
## 4 white           Female    79 112512.
## 5 person of color Female    22 108594.
```

```
bezos_gender_race_group_age5 <- bezos %>% group_by(race_grouping, gender, age_group_5)
bezos_gender_race_group_age5 <- bezos_gender_race_group_age5 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(bezos_gender_race_group_age5)
```

```
## # A tibble: 20 x 5
## # Groups:   race_grouping, gender [4]
##    race_grouping   gender age_group_5 count  median
##    <chr>           <chr>  <fct>       <int>   <dbl>
##  1 white           Female 45-49           7 160780
##  2 white           Male   55-59           8 156807.
##  3 white           Female 40-44           6 143750
##  4 white           Male   40-44          15 136468.
##  5 person of color Male   35-39           8 115530
##  6 white           Female 50-54           8 114975.
##  7 white           Male   35-39          24 107880
##  8 white           Female 35-39          15 105000
##  9 white           Male   45-49           9 102796.
```

```
## 10 person of color Female 35-39          8  99619.
## 11 white           Male   30-34         29  94780
## 12 person of color Male   25-29          8  88540
## 13 white           Female 30-34         24  87050
## 14 person of color Female 30-34         19  87000
## 15 person of color Male   30-34          5  87000
## 16 white           Female 25-29         37  81757.
## 17 person of color Female 25-29         19  77000
## 18 white           Male   25-29         21  76780
## 19 person of color Female <25           10  64390
## 20 white           Female <25            9  64280
```

```
graham_gender_race_group_age5 <- graham %>% group_by(race_grouping, gender, age_group_5)
graham_gender_race_group_age5 <- graham_gender_race_group_age5 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(graham_gender_race_group_age5)
```

```
## # A tibble: 18 x 5
## # Groups:   race_grouping, gender [4]
##    race_grouping   gender age_group_5 count  median
##    <chr>           <chr>  <fct>       <int>   <dbl>
##  1 white           Male   65+             8 153937.
##  2 white           Male   35-39          11 147300
##  3 white           Male   55-59          19 146542.
##  4 white           Female 55-59          16 138564.
##  5 white           Male   50-54          21 134547.
##  6 white           Male   60-64          14 123515.
##  7 white           Female 40-44           5 120780
##  8 person of color Female 40-44           5 118512.
##  9 person of color Male   50-54          11 116349.
## 10 white           Male   40-44          17 115237.
## 11 white           Female 50-54          15 114803
## 12 white           Female 60-64           7 112512.
## 13 white           Male   45-49           8 111473.
## 14 white           Female 45-49          12 100910.
## 15 white           Female 30-34           8 100788.
## 16 person of color Female 50-54           5  96944.
## 17 white           Female 35-39          11  88000
## 18 white           Male   30-34           5  83650.
```

```
bezos_gender_race_group_age5_tier <- bezos %>% group_by(race_grouping, gender, age_group_5, tier)
bezos_gender_race_group_age5_tier <- bezos_gender_race_group_age5_tier %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(bezos_gender_race_group_age5_tier)
```

```
## # A tibble: 20 x 6
## # Groups:   race_grouping, gender, age_group_5 [10]
##    race_grouping   gender age_group_5 tier   count  median
##    <chr>           <chr>  <fct>       <chr>  <int>   <dbl>
##  1 white           Male   40-44       Tier 1     8 191530
##  2 white           Male   35-39       Tier 1    10 130018.
```

```
##   3 white           Female 35-39       Tier 1      8 128330
##   4 white           Male   30-34       Tier 1     12 125233.
##   5 white           Male   45-49       Tier 2      5 120780
##   6 white           Female 25-29       Tier 1      5 100000
##   7 white           Male   30-34       Tier 2      5 100000
##   8 white           Male   35-39       Tier 2      8  98890
##   9 white           Female 30-34       Tier 2      6  93780
## 10 white           Male   35-39       Tier 3      6  93030
## 11 white           Male   25-29       Tier 2      6  91282.
## 12 white           Female 25-29       Tier 2      9  91000
## 13 white           Male   30-34       Tier 3     10  88240
## 14 person of color Female 30-34       Tier 2      7  88133.
## 15 white           Female 30-34       Tier 3     11  86000
## 16 person of color Female 30-34       Tier 3      6  83890.
## 17 white           Female 25-29       Tier 3     15  79140
## 18 person of color Female 25-29       Tier 3     12  77000
## 19 white           Male   25-29       Tier 3      8  73890
## 20 white           Female 25-29       Tier 4      8  69890
```

```
graham_gender_race_group_age5_tier <- graham %>% group_by(race_grouping, gender, age_group_5, tier)
graham_gender_race_group_age5_tier <- graham_gender_race_group_age5_tier %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(graham_gender_race_group_age5_tier)
```

```
## # A tibble: 21 x 6
## # Groups:   race_grouping, gender, age_group_5 [13]
##    race_grouping gender age_group_5 tier   count  median
##    <chr>         <chr>  <fct>       <chr>  <int>   <dbl>
##  1 white         Male   50-54       Tier 1     5 180040
##  2 white         Male   35-39       Tier 1     5 173280
##  3 white         Female 50-54       Tier 1     5 167780
##  4 white         Male   55-59       Tier 1     6 167172.
##  5 white         Male   60-64       Tier 1     5 166612.
##  6 white         Female 55-59       Tier 1     6 162854.
##  7 white         Female 55-59       Tier 2     5 149030.
##  8 white         Male   65+         Tier 2     6 147473.
##  9 white         Male   35-39       Tier 2     5 147300
## 10 white         Male   55-59       Tier 2    12 143129.
## # ... with 11 more rows
```

Overall disparity calculations

```
news_groups <- news_salaried %>% group_by(age_group_5, tier)
news_groups <- news_groups %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(news_groups)
```

```
## # A tibble: 30 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 tier   count median
##    <fct>       <chr>  <int>  <dbl>
```

```
##   1 <25          Tier 2    10  65140
##   2 <25          Tier 3     8  66250
##   3 25-29        Tier 1    13 110000
##   4 25-29        Tier 2    23  90000
##   5 25-29        Tier 3    38  77000
##   6 25-29        Tier 4    17  75000
##   7 30-34        Tier 1    35 121280
##   8 30-34        Tier 2    27  94535
##   9 30-34        Tier 3    32  83140
##  10 30-34        Tier 4     9  77000
## # ... with 20 more rows
```

```
expected_medians <- merge(news_salaried, news_groups, by=c('age_group_5', 'tier'), all.x = TRUE)

below_expected_medians <- filter(expected_medians, current_base_pay < median) %>% group_by(race_grouping
below_expected_medians <- below_expected_medians %>% summarise(
  count = length(current_base_pay)
)
suppress(below_expected_medians)
```

```
## # A tibble: 6 x 3
## # Groups:   race_grouping [3]
##   race_grouping   gender count
##   <chr>           <chr>  <int>
## 1 person of color Female    48
## 2 person of color Male      30
## 3 unknown         Female     7
## 4 unknown         Male       8
## 5 white           Female    94
## 6 white           Male      89
```

```
above_expected_medians <- filter(expected_medians, current_base_pay > median) %>% group_by(race_grouping
above_expected_medians <- above_expected_medians %>% summarise(
  count = length(current_base_pay)
)
suppress(above_expected_medians)
```

```
## # A tibble: 5 x 3
## # Groups:   race_grouping [3]
##   race_grouping   gender count
##   <chr>           <chr>  <int>
## 1 person of color Female    30
## 2 person of color Male      21
## 3 unknown         Male       8
## 4 white           Female    90
## 5 white           Male     121
```

```
expected_medians <- expected_medians %>% mutate(disparity = current_base_pay - median,
                    disparity_pct = (current_base_pay - median)/median)

disparity <- expected_medians %>% group_by(race_grouping, gender)
disparity <- disparity %>% summarise(
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(disparity)
```

```
## # A tibble: 6 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median_disparity
##   <chr>           <chr>  <int>            <dbl>
## 1 person of color Female    83          -1360
## 2 person of color Male      56           -407.
## 3 unknown         Female    13          -1300
## 4 unknown         Male      16           1537.
## 5 white           Female   188            -14.2
## 6 white           Male     218           2448.
```

```r
disparity_pct_above <- filter(expected_medians, disparity_pct > .05) %>% group_by(race_grouping, gender)
disparity_pct_above <- disparity_pct_above %>% summarise(
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(disparity_pct_above)
```

```
## # A tibble: 5 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median_disparity
##   <chr>           <chr>  <int>            <dbl>
## 1 person of color Female    20            9360
## 2 person of color Male      15           24700
## 3 unknown         Male       7           29500
## 4 white           Female    65           19211.
## 5 white           Male     101           28780
```

```r
disparity_pct_below <- filter(expected_medians, disparity_pct < -.05) %>% group_by(race_grouping, gende
disparity_pct_below <- disparity_pct_below %>% summarise(
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(disparity_pct_below)
```

```
## # A tibble: 5 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median_disparity
##   <chr>           <chr>  <int>            <dbl>
## 1 person of color Female    36          -10140
## 2 person of color Male      21          -15435
## 3 unknown         Female     6          -14390
## 4 white           Female    70          -14589.
## 5 white           Male      68          -18102.
```

```r
bezos_news_groups <- bezos %>% group_by(age_group_5, tier)
bezos_news_groups <- bezos_news_groups %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(bezos_news_groups)
```

```
## # A tibble: 20 x 4
## # Groups:   age_group_5 [7]
##    age_group_5 tier   count  median
##    <fct>       <chr>  <int>   <dbl>
```

```
##   1 <25         Tier 2    10  65140
##   2 <25         Tier 3     8  66250
##   3 25-29       Tier 1    12 110000
##   4 25-29       Tier 2    23  90000
##   5 25-29       Tier 3    38  77000
##   6 25-29       Tier 4    17  75000
##   7 30-34       Tier 1    28 120843.
##   8 30-34       Tier 2    19  95656.
##   9 30-34       Tier 3    30  84640
##  10 30-34       Tier 4     7  77000
##  11 35-39       Tier 1    26 122940
##  12 35-39       Tier 2    16 102801.
##  13 35-39       Tier 3    13  90780
##  14 40-44       Tier 1    18 148572.
##  15 40-44       Tier 2     6 128713.
##  16 40-44       Tier 3     7 103000
##  17 45-49       Tier 2     9 120780
##  18 45-49       Tier 3     6  91234.
##  19 50-54       Tier 2     7 107171.
##  20 50-54       Tier 3     5  92352.
```

```
bezos_expected_medians <- merge(bezos, bezos_news_groups, by=c('age_group_5', 'tier'), all.x = TRUE)

graham_news_groups <- graham %>% group_by(age_group_5, tier)
graham_news_groups <- graham_news_groups %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(graham_news_groups)
```

```
## # A tibble: 20 x 4
## # Groups:   age_group_5 [8]
##     age_group_5 tier   count  median
##     <fct>       <chr>  <int>   <dbl>
##   1 30-34       Tier 1     7 121280
##   2 30-34       Tier 2     8  89092.
##   3 35-39       Tier 1     9 125000
##   4 35-39       Tier 2    14  95500
##   5 35-39       Tier 3     6  89000.
##   6 40-44       Tier 1    13 129780
##   7 40-44       Tier 2    13 104560.
##   8 45-49       Tier 1     8 158458.
##   9 45-49       Tier 2    12  94653.
##  10 50-54       Tier 1    13 165685.
##  11 50-54       Tier 2    30 117266.
##  12 50-54       Tier 3    10 100406.
##  13 55-59       Tier 1    17 170497.
##  14 55-59       Tier 2    18 143186.
##  15 55-59       Tier 3     6  92226.
##  16 60-64       Tier 1    10 158690.
##  17 60-64       Tier 2     9 112512.
##  18 60-64       Tier 3     5 107212.
##  19 65+         Tier 1     6 172067.
##  20 65+         Tier 2     8 147473.
```

```r
graham_expected_medians <- merge(graham, graham_news_groups, by=c('age_group_5', 'tier'), all.x = TRUE)

bezos_expected_medians <- bezos_expected_medians %>% mutate(disparity = current_base_pay - median,
                       disparity_pct = (current_base_pay - median)/median)

graham_expected_medians <- graham_expected_medians %>% mutate(disparity = current_base_pay - median,
                       disparity_pct = (current_base_pay - median)/median)

bezos_disparity_gender <- bezos_expected_medians %>% group_by(gender)
bezos_disparity_gender <- bezos_disparity_gender %>% summarise(
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(bezos_disparity_gender)
```

```
## # A tibble: 2 x 3
##   gender count median_disparity
##   <chr>  <int>            <dbl>
## 1 Female   180           -352.
## 2 Male     157             66.9
```

```r
bezos_disparity_race_group <- bezos_expected_medians %>% group_by(race_grouping)
bezos_disparity_race_group <- bezos_disparity_race_group %>% summarise(
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(bezos_disparity_race_group)
```

```
## # A tibble: 3 x 3
##   race_grouping   count median_disparity
##   <chr>           <int>            <dbl>
## 1 person of color    93               0
## 2 unknown            20           -4536.
## 3 white             224               0
```

```r
bezos_disparity_gender_race_group <- bezos_expected_medians %>% group_by(race_grouping, gender)
bezos_disparity_gender_race_group <- bezos_disparity_gender_race_group %>% summarise(
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(bezos_disparity_gender_race_group)
```

```
## # A tibble: 6 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median_disparity
##   <chr>           <chr>  <int>            <dbl>
## 1 person of color Female    61             -590
## 2 person of color Male      32                0
## 3 unknown         Female    10            -6070
## 4 unknown         Male      10            7453.
## 5 white           Female   109                0
## 6 white           Male     115             454.
```

```r
graham_disparity_gender <- graham_expected_medians %>% group_by(gender)
graham_disparity_gender <- graham_disparity_gender %>% summarise(
```

```
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(graham_disparity_gender)
```

```
## # A tibble: 2 x 3
##   gender count median_disparity
##   <chr>  <int>            <dbl>
## 1 Female   104            -905.
## 2 Male     133             475.
```

```
graham_disparity_race_group <- graham_expected_medians %>% group_by(race_grouping)
graham_disparity_race_group <- graham_disparity_race_group %>% summarise(
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(graham_disparity_race_group)
```

```
## # A tibble: 3 x 3
##   race_grouping   count median_disparity
##   <chr>           <int>            <dbl>
## 1 person of color    46           -5439.
## 2 unknown             9           -3191.
## 3 white             182            2069.
```

```
graham_disparity_gender_race_group <- graham_expected_medians %>% group_by(race_grouping, gender)
graham_disparity_gender_race_group <- graham_disparity_gender_race_group %>% summarise(
  count = length(disparity),
  median_disparity = median(disparity, na.rm = TRUE)
)
suppress(graham_disparity_gender_race_group)
```

```
## # A tibble: 5 x 4
## # Groups:   race_grouping [3]
##   race_grouping   gender count median_disparity
##   <chr>           <chr>  <int>            <dbl>
## 1 person of color Female    22           -6599.
## 2 person of color Male      24           -1409.
## 3 unknown         Male       6           -2850.
## 4 white           Female    79             810.
## 5 white           Male     103            3355.
```

Regression

```
news_salaried_regression <- news_salaried[,c('department','gender','race_ethnicity','current_base_pay',
news_salaried_regression <- fastDummies::dummy_cols(news_salaried_regression, select_columns = c('gende
names(news_salaried_regression) <- gsub(' ', '_', names(news_salaried_regression))
names(news_salaried_regression) <- gsub('-', 'to', names(news_salaried_regression))
names(news_salaried_regression) <- gsub('\\+', '_over', names(news_salaried_regression))
names(news_salaried_regression) <- gsub('<', 'under_', names(news_salaried_regression))

linearMod1 <- lm(formula = current_base_pay ~ gender_Female + gender_Male, data=news_salaried_regressio
summary(linearMod1)
```

```
##
```

```
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male,
##     data = news_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -66717 -30572 -10009  22943 207383
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     124717       2500  49.895  < 2e-16 ***
## gender_Female   -17250       3554  -4.854 1.56e-06 ***
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 42570 on 572 degrees of freedom
## Multiple R-squared:  0.03957,    Adjusted R-squared:  0.03789
## F-statistic: 23.56 on 1 and 572 DF,  p-value: 1.561e-06
```

```r
linearMod2 <- lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color, data=
summary(linearMod2)
```

```
##
## Call:
## lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color,
##     data = news_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -62782 -30287 -11247  24529 211317
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     127084       7897  16.092  < 2e-16 ***
## race_grouping_white              -6302       8175  -0.771  0.44107
## race_grouping_person_of_color   -26614       8682  -3.065  0.00228 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 42530 on 571 degrees of freedom
## Multiple R-squared:  0.04295,    Adjusted R-squared:  0.0396
## F-statistic: 12.81 on 2 and 571 DF,  p-value: 3.602e-06
```

```r
linearMod3 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod3)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = news_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -69906 -30002  -9689  22094 204194
```

```
##
## Coefficients: (1 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    133980       7934  16.888  < 2e-16 ***
## gender_Female                  -15384       3519  -4.371 1.47e-05 ***
## gender_Male                        NA         NA      NA       NA
## race_grouping_white             -6075       8048  -0.755  0.45069
## race_grouping_person_of_color  -24324       8564  -2.840  0.00467 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 41870 on 570 degrees of freedom
## Multiple R-squared:  0.074,  Adjusted R-squared:  0.06912
## F-statistic: 15.18 on 3 and 570 DF,  p-value: 1.617e-09
```

```r
linearMod4 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + age_group_5_under_25 + age_g
summary(linearMod4)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = news_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -86172 -22779  -7300  13780 181520
##
## Coefficients: (2 not defined because of singularities)
##                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)             167625       9729  17.229  < 2e-16 ***
## gender_Female            -8165       3214  -2.540 0.011345 *
## gender_Male                 NA         NA      NA       NA
## age_group_5_under_25    -94875      12415  -7.642 9.25e-14 ***
## age_group_5_25to29      -75435      10489  -7.192 2.05e-12 ***
## age_group_5_30to34      -59320      10374  -5.718 1.75e-08 ***
## age_group_5_35to39      -48805      10485  -4.655 4.05e-06 ***
## age_group_5_40to44      -30359      10760  -2.821 0.004949 **
## age_group_5_45to49      -38200      11239  -3.399 0.000724 ***
## age_group_5_50to54      -35503      10659  -3.331 0.000923 ***
## age_group_5_55to59      -19524      11005  -1.774 0.076595 .
## age_group_5_60to64      -25877      11987  -2.159 0.031299 *
## age_group_5_65_over         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 37450 on 563 degrees of freedom
## Multiple R-squared:  0.2682, Adjusted R-squared:  0.2552
## F-statistic: 20.63 on 10 and 563 DF,  p-value: < 2.2e-16
```

```r
linearMod5 <- lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color + age_
summary(linearMod5)
```

```
##
## Call:
## lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = news_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -83570 -24373  -6835  13690 175683
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     175496      11714  14.982  < 2e-16 ***
## race_grouping_white             -10472       7206  -1.453 0.146732
## race_grouping_person_of_color   -22748       7649  -2.974 0.003064 **
## age_group_5_under_25            -93548      12337  -7.583 1.41e-13 ***
## age_group_5_25to29              -75151      10408  -7.221 1.69e-12 ***
## age_group_5_30to34              -58814      10318  -5.700 1.93e-08 ***
## age_group_5_35to39              -46772      10444  -4.478 9.11e-06 ***
## age_group_5_40to44              -28517      10714  -2.662 0.007999 **
## age_group_5_45to49              -37927      11169  -3.396 0.000733 ***
## age_group_5_50to54              -33076      10623  -3.114 0.001942 **
## age_group_5_55to59              -19411      10936  -1.775 0.076454 .
## age_group_5_60to64              -26272      11912  -2.205 0.027827 *
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 37220 on 562 degrees of freedom
## Multiple R-squared:  0.2784, Adjusted R-squared:  0.2643
## F-statistic: 19.71 on 11 and 562 DF,  p-value: < 2.2e-16
```

```r
linearMod6 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod6)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = news_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -85913 -23282  -6439  12503 179595
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     177610      11711  15.166  < 2e-16 ***
## gender_Female                    -7131       3197  -2.230 0.026121 *
## gender_Male                         NA         NA      NA       NA
```

```
## race_grouping_white             -10244       7182  -1.426 0.154303
## race_grouping_person_of_color   -21779       7634  -2.853 0.004492 **
## age_group_5_under_25            -90575      12366  -7.325 8.37e-13 ***
## age_group_5_25to29              -72999      10416  -7.008 6.94e-12 ***
## age_group_5_30to34              -57392      10302  -5.571 3.93e-08 ***
## age_group_5_35to39              -46156      10411  -4.433 1.12e-05 ***
## age_group_5_40to44              -28528      10677  -2.672 0.007759 **
## age_group_5_45to49              -37051      11136  -3.327 0.000935 ***
## age_group_5_50to54              -32670      10587  -3.086 0.002130 **
## age_group_5_55to59              -18756      10902  -1.720 0.085904 .
## age_group_5_60to64              -25603      11874  -2.156 0.031490 *
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 37090 on 561 degrees of freedom
## Multiple R-squared:  0.2848, Adjusted R-squared:  0.2695
## F-statistic: 18.61 on 12 and 561 DF,  p-value: < 2.2e-16
```

```r
linearMod7 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod7)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over +
##     tier_Tier_1 + tier_Tier_2 + tier_Tier_3 + tier_Tier_4, data = news_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -73755 -19471  -4221  11237 181914
##
## Coefficients: (3 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   120967.5    11990.4  10.089  < 2e-16 ***
## gender_Female                  -4876.0     2760.7  -1.766 0.077907 .
## gender_Male                         NA         NA      NA       NA
## race_grouping_white             9406.8     6384.3   1.473 0.141200
## race_grouping_person_of_color    651.1     6797.4   0.096 0.923721
## age_group_5_under_25          -70967.7    10751.7  -6.601 9.54e-11 ***
## age_group_5_25to29            -51967.8     9147.7  -5.681 2.16e-08 ***
## age_group_5_30to34            -45835.5     8943.2  -5.125 4.10e-07 ***
## age_group_5_35to39            -40948.5     8989.4  -4.555 6.43e-06 ***
## age_group_5_40to44            -25228.7     9217.5  -2.737 0.006397 **
## age_group_5_45to49            -28012.2     9613.5  -2.914 0.003713 **
## age_group_5_50to54            -22011.8     9145.4  -2.407 0.016413 *
## age_group_5_55to59            -13805.7     9398.9  -1.469 0.142435
## age_group_5_60to64            -20565.1    10235.5  -2.009 0.044997 *
## age_group_5_65_over                 NA         NA      NA       NA
## tier_Tier_1                    53348.3     6214.7   8.584  < 2e-16 ***
## tier_Tier_2                    23380.1     6049.1   3.865 0.000124 ***
## tier_Tier_3                     2870.8     6037.4   0.475 0.634619
```

```
## tier_Tier_4                          NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 31930 on 558 degrees of freedom
## Multiple R-squared:  0.4729, Adjusted R-squared:  0.4587
## F-statistic: 33.38 on 15 and 558 DF,  p-value: < 2.2e-16
```

```
linearMod8 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod8)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over +
##     tier_Tier_1 + tier_Tier_2 + tier_Tier_3 + tier_Tier_4 + years_of_service_grouped_0 +
##     years_of_service_grouped_1to2 + years_of_service_grouped_3to5 +
##     years_of_service_grouped_6to10 + years_of_service_grouped_11to15 +
##     years_of_service_grouped_16to20 + years_of_service_grouped_21to25 +
##     years_of_service_grouped_25_over, data = news_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -78346 -19056  -3790  11052 174977
##
## Coefficients: (4 not defined because of singularities)
##                                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        125096      13133   9.525  < 2e-16 ***
## gender_Female                       -4750       2766  -1.717  0.08653 .
## gender_Male                            NA         NA      NA       NA
## race_grouping_white                  9871       6401   1.542  0.12364
## race_grouping_person_of_color        1117       6822   0.164  0.86996
## age_group_5_under_25               -78083      11460  -6.814 2.50e-11 ***
## age_group_5_25to29                 -57223       9842  -5.814 1.03e-08 ***
## age_group_5_30to34                 -49792       9556  -5.211 2.66e-07 ***
## age_group_5_35to39                 -44320       9550  -4.641 4.35e-06 ***
## age_group_5_40to44                 -27729       9612  -2.885  0.00407 **
## age_group_5_45to49                 -29546       9874  -2.992  0.00289 **
## age_group_5_50to54                 -22921       9304  -2.464  0.01406 *
## age_group_5_55to59                 -14698       9472  -1.552  0.12129
## age_group_5_60to64                 -23419      10417  -2.248  0.02495 *
## age_group_5_65_over                    NA         NA      NA       NA
## tier_Tier_1                         54494       6295   8.657  < 2e-16 ***
## tier_Tier_2                         24832       6191   4.011 6.88e-05 ***
## tier_Tier_3                          3350       6125   0.547  0.58466
## tier_Tier_4                            NA         NA      NA       NA
## years_of_service_grouped_0           1437       8374   0.172  0.86380
## years_of_service_grouped_1to2        2300       7767   0.296  0.76728
## years_of_service_grouped_3to5       -2442       7660  -0.319  0.75001
## years_of_service_grouped_6to10      -7719       8036  -0.961  0.33722
## years_of_service_grouped_11to15     -6384       8152  -0.783  0.43394
## years_of_service_grouped_16to20     -6308       7463  -0.845  0.39831
```

```
## years_of_service_grouped_21to25    -12596       8953  -1.407  0.16003
## years_of_service_grouped_25_over       NA          NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 31910 on 551 degrees of freedom
## Multiple R-squared:  0.4802, Adjusted R-squared:  0.4594
## F-statistic: 23.14 on 22 and 551 DF,  p-value: < 2.2e-16
```

```
merit_raises_combined_salaried_regression <- filter(merit_raises_combined, dept == 'News', pay_rate_typ

merit_raises_combined_salaried_regression <- fastDummies::dummy_cols(merit_raises_combined_salaried_reg
names(merit_raises_combined_salaried_regression) <- gsub(' ', '_', names(merit_raises_combined_salaried_
names(merit_raises_combined_salaried_regression) <- gsub('-', 'to', names(merit_raises_combined_salarie
names(merit_raises_combined_salaried_regression) <- gsub('\\+', '_over', names(merit_raises_combined_sal
names(merit_raises_combined_salaried_regression) <- gsub('<', 'under_', names(merit_raises_combined_sal

linearMod9 <- lm(formula = base_pay_change ~ gender_Female + gender_Male, data=merit_raises_combined_sal
summary(linearMod9)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male, data = merit_raises_combined_salaried_reg
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2775.8 -1074.6  -275.8   724.2 16724.0
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3275.85      75.31   43.49   <2e-16 ***
## gender_Female  -201.24     111.20   -1.81   0.0707 .
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1578 on 809 degrees of freedom
## Multiple R-squared:  0.004032,   Adjusted R-squared:  0.0028
## F-statistic: 3.275 on 1 and 809 DF,  p-value: 0.07072
```

```
linearMod10 <- lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color, data
summary(linearMod10)
```

```
##
## Call:
## lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2747.6  -997.6  -247.6   752.4 16752.3
##
## Coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      3426.8      394.1   8.694   <2e-16 ***
```

```
## race_grouping_white             -179.2      399.2  -0.449    0.654
## race_grouping_person_of_color   -494.1      411.9  -1.200    0.231
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1577 on 808 degrees of freedom
## Multiple R-squared:  0.00714,    Adjusted R-squared:  0.004682
## F-statistic: 2.905 on 2 and 808 DF,  p-value: 0.05531
```

```r
linearMod11 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod11)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = merit_raises_combined_salaried_regres
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2824.7 -1031.6  -324.7   675.3 16675.2
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     3527.6      398.7   8.847   <2e-16 ***
## gender_Female                   -179.4      111.6  -1.607    0.108
## gender_Male                         NA         NA      NA       NA
## race_grouping_white             -203.0      399.1  -0.509    0.611
## race_grouping_person_of_color   -496.0      411.5  -1.205    0.228
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1575 on 807 degrees of freedom
## Multiple R-squared:  0.01031,    Adjusted R-squared:  0.006628
## F-statistic: 2.802 on 3 and 807 DF,  p-value: 0.03901
```

```r
linearMod12 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + age_group_5_under_25 + age_g
summary(linearMod12)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2811.4  -919.2  -269.6   580.8 16528.8
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)            2650.4      254.7  10.408  < 2e-16 ***
## gender_Female          -225.4      110.8  -2.034 0.042296 *
## gender_Male                NA         NA      NA       NA
```

```
## age_group_5_under_25   -312.6      684.1  -0.457 0.647863
## age_group_5_25to29      661.0      315.0   2.098 0.036175 *
## age_group_5_30to34      820.6      285.2   2.877 0.004117 **
## age_group_5_35to39      994.2      289.1   3.439 0.000614 ***
## age_group_5_40to44      942.4      297.5   3.168 0.001596 **
## age_group_5_45to49      768.5      309.3   2.484 0.013191 *
## age_group_5_50to54      113.3      288.2   0.393 0.694409
## age_group_5_55to59      561.6      299.4   1.875 0.061104 .
## age_group_5_60to64      476.2      330.1   1.442 0.149582
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1552 on 800 degrees of freedom
## Multiple R-squared:  0.04691,    Adjusted R-squared:  0.03499
## F-statistic: 3.937 on 10 and 800 DF,  p-value: 2.953e-05
```

```
linearMod13 <- lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color + age_
summary(linearMod13)
```

```
##
## Call:
## lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2764.1  -940.3  -289.7   602.3 16548.0
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     2607.1      469.0   5.559 3.69e-08 ***
## race_grouping_white              -33.8      395.9  -0.085 0.931998
## race_grouping_person_of_color   -425.7      407.7  -1.044 0.296638
## age_group_5_under_25            -423.3      680.6  -0.622 0.534129
## age_group_5_25to29               690.8      314.9   2.194 0.028528 *
## age_group_5_30to34               878.6      286.2   3.070 0.002210 **
## age_group_5_35to39              1066.6      290.4   3.673 0.000256 ***
## age_group_5_40to44              1053.7      301.1   3.500 0.000492 ***
## age_group_5_45to49               790.0      309.0   2.557 0.010753 *
## age_group_5_50to54               216.4      290.5   0.745 0.456589
## age_group_5_55to59               583.6      299.1   1.951 0.051391 .
## age_group_5_60to64               498.6      330.1   1.510 0.131317
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1549 on 799 degrees of freedom
## Multiple R-squared:  0.0519, Adjusted R-squared:  0.03885
## F-statistic: 3.976 on 11 and 799 DF,  p-value: 1.165e-05
```

```r
linearMod14 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod14)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2877.3  -956.5  -288.3   589.4 16449.3
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    2704.77     471.57   5.736 1.38e-08 ***
## gender_Female                  -196.82     111.10  -1.772 0.076853 .
## gender_Male                         NA         NA      NA       NA
## race_grouping_white             -64.13     395.78  -0.162 0.871313
## race_grouping_person_of_color  -431.55     407.13  -1.060 0.289475
## age_group_5_under_25           -326.62     681.85  -0.479 0.632053
## age_group_5_25to29              736.69     315.51   2.335 0.019794 *
## age_group_5_30to34              909.99     286.33   3.178 0.001539 **
## age_group_5_35to39             1086.86     290.23   3.745 0.000194 ***
## age_group_5_40to44             1048.77     300.69   3.488 0.000513 ***
## age_group_5_45to49              808.51     308.75   2.619 0.008996 **
## age_group_5_50to54              221.43     290.13   0.763 0.445568
## age_group_5_55to59              594.80     298.76   1.991 0.046834 *
## age_group_5_60to64              512.72     329.73   1.555 0.120345
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1547 on 798 degrees of freedom
## Multiple R-squared:  0.05562,    Adjusted R-squared:  0.04142
## F-statistic: 3.916 on 12 and 798 DF,  p-value: 7.08e-06
```

```r
linearMod15 <- lm(formula = performance_rating ~ gender_Female + gender_Male, data=merit_raises_combined
summary(linearMod15)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.8339 -0.2063 -0.0339  0.1937  1.0661
##
## Coefficients: (1 not defined because of singularities)
##                Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)    3.60631    0.01616 223.118  < 2e-16 ***
## gender_Female -0.07241    0.02383  -3.038  0.00246 **
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3281 on 761 degrees of freedom
##   (48 observations deleted due to missingness)
## Multiple R-squared:  0.01199,    Adjusted R-squared:  0.01069
## F-statistic: 9.232 on 1 and 761 DF,  p-value: 0.00246
```

```
linearMod16 <- lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color, da
summary(linearMod16)
```

```
##
## Call:
## lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.90017 -0.20017 -0.00017  0.19983  0.99983
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.72500    0.08115  45.900  < 2e-16 ***
## race_grouping_white           -0.12483    0.08226  -1.517  0.12957
## race_grouping_person_of_color -0.26258    0.08500  -3.089  0.00208 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3246 on 760 degrees of freedom
##   (48 observations deleted due to missingness)
## Multiple R-squared:  0.03398,    Adjusted R-squared:  0.03143
## F-statistic: 13.37 on 2 and 760 DF,  p-value: 1.974e-06
```

```
linearMod17 <- lm(formula = performance_rating ~ gender_Female + gender_Male + race_grouping_white + rac
summary(linearMod17)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = merit_raises_combined_salaried_regres
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.86450 -0.22704 -0.02704  0.17296  1.03550
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.76018    0.08192  45.900  < 2e-16 ***
## gender_Female                 -0.06254    0.02363  -2.647  0.00830 **
## gender_Male                         NA         NA      NA       NA
## race_grouping_white           -0.13314    0.08200  -1.624  0.10486
## race_grouping_person_of_color -0.26288    0.08466  -3.105  0.00197 **
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3233 on 759 degrees of freedom
##   (48 observations deleted due to missingness)
## Multiple R-squared:  0.04281,    Adjusted R-squared:  0.03903
## F-statistic: 11.32 on 3 and 759 DF,  p-value: 2.878e-07
```

```
linearMod18 <- lm(formula = performance_rating ~ gender_Female + gender_Male + age_group_5_under_25 + ag
summary(linearMod18)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.79665 -0.22275 -0.04557  0.20335  1.04477
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)           3.71995    0.05474  67.951  < 2e-16 ***
## gender_Female        -0.05524    0.02383  -2.318 0.020734 *
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25 -0.42391    0.14348  -2.954 0.003230 **
## age_group_5_25to29   -0.23365    0.06766  -3.453 0.000585 ***
## age_group_5_30to34   -0.16806    0.06119  -2.746 0.006170 **
## age_group_5_35to39   -0.11914    0.06202  -1.921 0.055133 .
## age_group_5_40to44   -0.07345    0.06377  -1.152 0.249801
## age_group_5_45to49   -0.14779    0.06609  -2.236 0.025631 *
## age_group_5_50to54   -0.10948    0.06225  -1.759 0.079048 .
## age_group_5_55to59   -0.05711    0.06463  -0.884 0.377127
## age_group_5_60to64   -0.09720    0.07062  -1.376 0.169122
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3244 on 752 degrees of freedom
##   (48 observations deleted due to missingness)
## Multiple R-squared:  0.04554,    Adjusted R-squared:  0.03284
## F-statistic: 3.588 on 10 and 752 DF,  p-value: 0.0001139
```

```
linearMod19 <- lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color + a
summary(linearMod19)
```

```
##
## Call:
## lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
```

```
##     age_group_5_65_over, data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.85831 -0.21122 -0.02461  0.20166  0.99313
##
## Coefficients: (1 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   3.81831    0.09786  39.020  < 2e-16 ***
## race_grouping_white          -0.11831    0.08200  -1.443  0.14947
## race_grouping_person_of_color -0.25310    0.08450  -2.995  0.00283 **
## age_group_5_under_25         -0.45000    0.14130  -3.185  0.00151 **
## age_group_5_25to29           -0.21815    0.06703  -3.255  0.00119 **
## age_group_5_30to34           -0.14169    0.06088  -2.327  0.02022 *
## age_group_5_35to39           -0.09313    0.06165  -1.511  0.13129
## age_group_5_40to44           -0.04061    0.06390  -0.635  0.52532
## age_group_5_45to49           -0.13706    0.06537  -2.097  0.03637 *
## age_group_5_50to54           -0.07541    0.06208  -1.215  0.22483
## age_group_5_55to59           -0.04649    0.06392  -0.727  0.46726
## age_group_5_60to64           -0.08878    0.06993  -1.270  0.20460
## age_group_5_65_over                NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3204 on 751 degrees of freedom
##   (48 observations deleted due to missingness)
## Multiple R-squared:  0.06981,    Adjusted R-squared:  0.05618
## F-statistic: 5.124 on 11 and 751 DF,  p-value: 8.908e-08
```

```
linearMod20 <- lm(formula = performance_rating ~ gender_Female + gender_Male + race_grouping_white + ra
summary(linearMod20)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.83393 -0.22779 -0.02923  0.20972  1.00255
##
## Coefficients: (2 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   3.84222    0.09844  39.031  < 2e-16 ***
## gender_Female                -0.04611    0.02364  -1.950  0.05149 .
## gender_Male                        NA         NA      NA       NA
## race_grouping_white          -0.12557    0.08193  -1.533  0.12578
## race_grouping_person_of_color -0.25452    0.08435  -3.017  0.00264 **
## age_group_5_under_25         -0.42822    0.14148  -3.027  0.00256 **
## age_group_5_25to29           -0.20809    0.06710  -3.101  0.00200 **
## age_group_5_30to34           -0.13661    0.06082  -2.246  0.02499 *
```

```
## age_group_5_35to39           -0.08886    0.06157  -1.443  0.14937
## age_group_5_40to44           -0.04247    0.06379  -0.666  0.50578
## age_group_5_45to49           -0.13432    0.06527  -2.058  0.03994 *
## age_group_5_50to54           -0.07309    0.06197  -1.179  0.23861
## age_group_5_55to59           -0.04519    0.06381  -0.708  0.47902
## age_group_5_60to64           -0.08742    0.06980  -1.252  0.21081
## age_group_5_65_over                NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3198 on 750 degrees of freedom
##   (48 observations deleted due to missingness)
## Multiple R-squared:  0.0745, Adjusted R-squared:  0.0597
## F-statistic: 5.031 on 12 and 750 DF,  p-value: 4.315e-08
```

```
news_hourly_regression <- news_hourly[,c('department','gender','race_ethnicity','current_base_pay','job
news_hourly_regression <- fastDummies::dummy_cols(news_hourly_regression, select_columns = c('gender','
names(news_hourly_regression) <- gsub(' ', '_', names(news_hourly_regression))
names(news_hourly_regression) <- gsub('-', 'to', names(news_hourly_regression))
names(news_hourly_regression) <- gsub('\\+', '_over', names(news_hourly_regression))
names(news_hourly_regression) <- gsub('<', 'under_', names(news_hourly_regression))

linearMod21 <- lm(formula = current_base_pay ~ gender_Female + gender_Male, data=news_hourly_regression)
summary(linearMod21)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male,
##     data = news_hourly_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -20.179  -6.719  -0.449   6.101  34.131
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     32.031      2.029  15.786   <2e-16 ***
## gender_Female    2.898      2.505   1.157     0.25
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 11.66 on 94 degrees of freedom
## Multiple R-squared:  0.01404,    Adjusted R-squared:  0.003553
## F-statistic: 1.339 on 1 and 94 DF,  p-value: 0.2502
```

```
linearMod22 <- lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color, data
summary(linearMod22)
```

```
##
## Call:
## lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color,
##     data = news_hourly_regression)
##
## Residuals:
```

```
##     Min      1Q  Median      3Q     Max
## -20.799  -6.485  -0.920   5.844  33.511
##
## Coefficients:
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    39.230      8.131   4.825 5.47e-06 ***
## race_grouping_white            -3.681      8.257  -0.446    0.657
## race_grouping_person_of_color  -9.099      8.397  -1.084    0.281
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 11.5 on 93 degrees of freedom
## Multiple R-squared:  0.05071,    Adjusted R-squared:  0.0303
## F-statistic: 2.484 on 2 and 93 DF,  p-value: 0.08892
```

```
linearMod23 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod23)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = news_hourly_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -21.839  -5.883  -0.707   5.165  32.471
##
## Coefficients: (1 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    36.336      8.486   4.282 4.54e-05 ***
## gender_Female                   2.894      2.481   1.166    0.246
## gender_Male                        NA         NA      NA       NA
## race_grouping_white            -2.641      8.289  -0.319    0.751
## race_grouping_person_of_color  -8.134      8.422  -0.966    0.337
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 11.48 on 92 degrees of freedom
## Multiple R-squared:  0.06455,    Adjusted R-squared:  0.03404
## F-statistic: 2.116 on 3 and 92 DF,  p-value: 0.1036
```

```
linearMod24 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + age_group_5_under_25 + age_
summary(linearMod24)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = news_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -21.9861  -6.8240   0.1867   6.5690  21.9307
```

```
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)           43.2529     4.9315   8.771 1.57e-13 ***
## gender_Female          3.8764     2.3643   1.640 0.104789
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25 -20.4162     5.3074  -3.847 0.000231 ***
## age_group_5_25to29   -17.3859     5.0272  -3.458 0.000851 ***
## age_group_5_30to34   -12.0079     5.5888  -2.149 0.034514 *
## age_group_5_35to39   -13.9194     5.8204  -2.391 0.018988 *
## age_group_5_40to44    -7.8709     5.7096  -1.379 0.171659
## age_group_5_45to49    -0.8132     6.1672  -0.132 0.895405
## age_group_5_50to54    -6.2127     5.8069  -1.070 0.287704
## age_group_5_55to59    -9.4947     6.0858  -1.560 0.122442
## age_group_5_60to64    -3.5887     6.4582  -0.556 0.579887
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.18 on 85 degrees of freedom
## Multiple R-squared:  0.3194, Adjusted R-squared:  0.2394
## F-statistic:  3.99 on 10 and 85 DF,  p-value: 0.000172
```

```r
linearMod25 <- lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color + age
summary(linearMod25)
```

```
##
## Call:
## lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = news_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -21.7944  -8.2916   0.2457   6.6045  23.3800
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     57.365      8.810   6.511 5.17e-09 ***
## race_grouping_white             -9.920      7.561  -1.312 0.193086
## race_grouping_person_of_color  -12.646      7.728  -1.636 0.105485
## age_group_5_under_25           -20.825      5.346  -3.895 0.000196 ***
## age_group_5_25to29             -17.290      5.045  -3.427 0.000948 ***
## age_group_5_30to34             -15.444      5.590  -2.763 0.007043 **
## age_group_5_35to39             -14.666      5.820  -2.520 0.013624 *
## age_group_5_40to44              -9.303      5.710  -1.629 0.106989
## age_group_5_45to49              -1.320      6.207  -0.213 0.832088
## age_group_5_50to54              -6.815      5.831  -1.169 0.245745
## age_group_5_55to59             -12.189      6.009  -2.028 0.045688 *
## age_group_5_60to64              -5.454      6.528  -0.836 0.405793
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 10.21 on 84 degrees of freedom
## Multiple R-squared:  0.3243, Adjusted R-squared:  0.2358
## F-statistic: 3.665 on 11 and 84 DF,  p-value: 0.0002868
```

```
linearMod26 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod26)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = news_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -22.3029  -7.4082  -0.4587   6.2195  22.0580
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     53.290      9.243   5.766 1.35e-07 ***
## gender_Female                    3.305      2.385   1.386 0.169551
## gender_Male                         NA         NA      NA       NA
## race_grouping_white             -8.590      7.581  -1.133 0.260405
## race_grouping_person_of_color  -11.063      7.770  -1.424 0.158260
## age_group_5_under_25           -20.927      5.318  -3.935 0.000172 ***
## age_group_5_25to29             -17.120      5.020  -3.411 0.001003 **
## age_group_5_30to34             -13.803      5.685  -2.428 0.017343 *
## age_group_5_35to39             -14.081      5.803  -2.426 0.017414 *
## age_group_5_40to44              -8.450      5.712  -1.479 0.142828
## age_group_5_45to49              -1.371      6.173  -0.222 0.824773
## age_group_5_50to54              -6.612      5.801  -1.140 0.257613
## age_group_5_55to59             -10.424      6.111  -1.706 0.091769 .
## age_group_5_60to64              -4.692      6.516  -0.720 0.473490
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.15 on 83 degrees of freedom
## Multiple R-squared:  0.3396, Adjusted R-squared:  0.2441
## F-statistic: 3.557 on 12 and 83 DF,  p-value: 0.0002782
```

```
linearMod27 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod27)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over +
```

```
##     tier_Tier_1 + tier_Tier_2 + tier_Tier_3 + tier_Tier_4, data = news_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -24.2238  -6.6641  -0.0323   5.5695  21.6317
##
## Coefficients: (3 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   53.6848    14.0087   3.832 0.000252 ***
## gender_Female                  3.3510     2.3687   1.415 0.161044
## gender_Male                        NA         NA      NA       NA
## race_grouping_white           -6.0059     7.6086  -0.789 0.432234
## race_grouping_person_of_color  -8.6620     7.7760  -1.114 0.268644
## age_group_5_under_25         -21.7546     5.2967  -4.107 9.61e-05 ***
## age_group_5_25to29           -19.2538     5.0763  -3.793 0.000288 ***
## age_group_5_30to34           -14.5598     5.6815  -2.563 0.012263 *
## age_group_5_35to39           -14.7994     5.7933  -2.555 0.012528 *
## age_group_5_40to44            -9.3640     5.6801  -1.649 0.103157
## age_group_5_45to49            -1.7920     6.1190  -0.293 0.770392
## age_group_5_50to54            -6.7158     5.7787  -1.162 0.248626
## age_group_5_55to59            -9.7711     6.0652  -1.611 0.111116
## age_group_5_60to64            -6.6075     6.5166  -1.014 0.313667
## age_group_5_65_over                NA         NA      NA       NA
## tier_Tier_1                   -0.6841    10.6737  -0.064 0.949058
## tier_Tier_2                   -4.7945    10.5300  -0.455 0.650114
## tier_Tier_3                    0.3514    10.4066   0.034 0.973149
## tier_Tier_4                        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.04 on 80 degrees of freedom
## Multiple R-squared:  0.3771, Adjusted R-squared:  0.2603
## F-statistic: 3.229 on 15 and 80 DF,  p-value: 0.0003464
```

```r
linearMod28 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod28)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over +
##     tier_Tier_1 + tier_Tier_2 + tier_Tier_3 + tier_Tier_4 + years_of_service_grouped_0 +
##     years_of_service_grouped_1to2 + years_of_service_grouped_3to5 +
##     years_of_service_grouped_6to10 + years_of_service_grouped_11to15 +
##     years_of_service_grouped_16to20 + years_of_service_grouped_21to25 +
##     years_of_service_grouped_25_over, data = news_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -25.3075  -6.0851  -0.2956   4.8862  21.3493
##
## Coefficients: (4 not defined because of singularities)
```

```
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                          53.931     16.201   3.329 0.001369 **
## gender_Female                         3.898      2.602   1.498 0.138366
## gender_Male                              NA         NA      NA       NA
## race_grouping_white                  -6.516      8.151  -0.799 0.426690
## race_grouping_person_of_color        -8.812      8.264  -1.066 0.289779
## age_group_5_under_25                -26.059      7.469  -3.489 0.000825 ***
## age_group_5_25to29                  -23.476      7.134  -3.291 0.001541 **
## age_group_5_30to34                  -18.204      6.875  -2.648 0.009919 **
## age_group_5_35to39                  -16.802      6.260  -2.684 0.008991 **
## age_group_5_40to44                  -10.518      6.094  -1.726 0.088617 .
## age_group_5_45to49                   -3.107      6.913  -0.449 0.654408
## age_group_5_50to54                   -6.589      6.271  -1.051 0.296836
## age_group_5_55to59                  -10.051      6.443  -1.560 0.123107
## age_group_5_60to64                   -4.929      7.126  -0.692 0.491289
## age_group_5_65_over                      NA         NA      NA       NA
## tier_Tier_1                          -2.363     11.910  -0.198 0.843253
## tier_Tier_2                          -6.444     11.796  -0.546 0.586533
## tier_Tier_3                          -1.568     11.794  -0.133 0.894608
## tier_Tier_4                              NA         NA      NA       NA
## years_of_service_grouped_0            4.690      8.300   0.565 0.573758
## years_of_service_grouped_1to2         6.449      7.941   0.812 0.419322
## years_of_service_grouped_3to5         5.510      8.094   0.681 0.498186
## years_of_service_grouped_6to10        3.580      6.740   0.531 0.596937
## years_of_service_grouped_11to15       2.551      7.223   0.353 0.724986
## years_of_service_grouped_16to20      -1.724      6.531  -0.264 0.792586
## years_of_service_grouped_21to25       3.795      8.071   0.470 0.639637
## years_of_service_grouped_25_over         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.33 on 73 degrees of freedom
## Multiple R-squared:  0.3984, Adjusted R-squared:  0.2171
## F-statistic: 2.197 on 22 and 73 DF,  p-value: 0.006537
```

```r
merit_raises_combined_hourly_regression <- filter(merit_raises_combined, dept == 'News', pay_rate_type =

merit_raises_combined_hourly_regression <- fastDummies::dummy_cols(merit_raises_combined_hourly_regressi
names(merit_raises_combined_hourly_regression) <- gsub(' ', '_', names(merit_raises_combined_hourly_reg
names(merit_raises_combined_hourly_regression) <- gsub('-', 'to', names(merit_raises_combined_hourly_reg
names(merit_raises_combined_hourly_regression) <- gsub('\\+', '_over', names(merit_raises_combined_hourl
names(merit_raises_combined_hourly_regression) <- gsub('<', 'under_', names(merit_raises_combined_hourly

linearMod29 <- lm(formula = base_pay_change ~ gender_Female + gender_Male, data=merit_raises_combined_ho
summary(linearMod29)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male, data = merit_raises_combined_hourly_regre
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.4296 -0.8772 -0.3572  0.1916 11.2704
##
## Coefficients: (1 not defined because of singularities)
```

```
##                Estimate Std. Error t value Pr(>|t|)
## (Intercept)     1.3872     0.2213   6.270 6.27e-09 ***
## gender_Female   0.3023     0.2845   1.063     0.29
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.517 on 117 degrees of freedom
## Multiple R-squared:  0.009564,   Adjusted R-squared:  0.001098
## F-statistic:  1.13 on 1 and 117 DF,  p-value: 0.29
```

```
linearMod30 <- lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color, data=
summary(linearMod30)
```

```
##
## Call:
## lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.4851 -0.7451 -0.2051  0.2399 11.2149
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     1.1824     0.2468   4.790 4.92e-06 ***
## race_grouping_white             0.5627     0.2973   1.892   0.0609 .
## race_grouping_person_of_color       NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.501 on 117 degrees of freedom
## Multiple R-squared:  0.0297, Adjusted R-squared:  0.0214
## F-statistic: 3.581 on 1 and 117 DF,  p-value: 0.06092
```

```
linearMod31 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod31)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = merit_raises_combined_hourly_regress
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.5607 -0.7907 -0.2761  0.2293 11.1393
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     1.0747     0.2837   3.788 0.000242 ***
## gender_Female                   0.2214     0.2859   0.775 0.440140
## gender_Male                         NA         NA      NA       NA
## race_grouping_white             0.5246     0.3019   1.738 0.084920 .
## race_grouping_person_of_color       NA         NA      NA       NA
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.504 on 116 degrees of freedom
## Multiple R-squared:  0.03469,    Adjusted R-squared:  0.01805
## F-statistic: 2.084 on 2 and 116 DF,  p-value: 0.129
```

```
linearMod32 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + age_group_5_under_25 + age_g
summary(linearMod32)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_hourly_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.1687 -0.7028 -0.2051  0.1201 11.2348
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)           1.37422    0.72535   1.895   0.0608 .
## gender_Female         0.25473    0.31068   0.820   0.4141
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25 -0.94913    1.12219  -0.846   0.3995
## age_group_5_25to29    0.09621    0.74907   0.128   0.8980
## age_group_5_30to34    0.08219    0.78051   0.105   0.9163
## age_group_5_35to39   -0.16741    0.81641  -0.205   0.8379
## age_group_5_40to44    0.20675    0.81641   0.253   0.8006
## age_group_5_45to49    0.13063    0.78795   0.166   0.8686
## age_group_5_50to54   -0.24684    0.79405  -0.311   0.7565
## age_group_5_55to59   -0.20909    0.82883  -0.252   0.8013
## age_group_5_60to64    1.81974    1.02228   1.780   0.0779 .
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.524 on 108 degrees of freedom
## Multiple R-squared:  0.0775, Adjusted R-squared:  -0.007921
## F-statistic: 0.9073 on 10 and 108 DF,  p-value: 0.5293
```

```
linearMod33 <- lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color + age_
summary(linearMod33)
```

```
##
## Call:
## lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_hourly_regression)
##
## Residuals:
```

```
##     Min      1Q  Median      3Q     Max
## -2.1050 -0.7879 -0.2464  0.3048 10.9892
##
## Coefficients: (2 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   1.33904    0.68508   1.955   0.0532 .
## race_grouping_white           0.59741    0.32158   1.858   0.0659 .
## race_grouping_person_of_color      NA         NA      NA       NA
## age_group_5_under_25         -1.42644    1.11564  -1.279   0.2038
## age_group_5_25to29            0.03434    0.74037   0.046   0.9631
## age_group_5_30to34           -0.33672    0.77282  -0.436   0.6639
## age_group_5_35to39           -0.30357    0.80155  -0.379   0.7056
## age_group_5_40to44           -0.12854    0.81293  -0.158   0.8747
## age_group_5_45to49           -0.06264    0.78171  -0.080   0.9363
## age_group_5_50to54           -0.46271    0.79365  -0.583   0.5611
## age_group_5_55to59           -0.43830    0.81509  -0.538   0.5919
## age_group_5_60to64            1.44856    1.02761   1.410   0.1615
## age_group_5_65_over                NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.505 on 108 degrees of freedom
## Multiple R-squared:  0.1005, Adjusted R-squared:  0.01721
## F-statistic: 1.207 on 10 and 108 DF,  p-value: 0.2949
```

```
linearMod34 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod34)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.1318 -0.7714 -0.2091  0.2843 10.9822
##
## Coefficients: (3 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   1.26541    0.72209   1.752   0.0826 .
## gender_Female                 0.10738    0.32017   0.335   0.7380
## gender_Male                        NA         NA      NA       NA
## race_grouping_white           0.56673    0.33561   1.689   0.0942 .
## race_grouping_person_of_color      NA         NA      NA       NA
## age_group_5_under_25         -1.35793    1.13873  -1.192   0.2357
## age_group_5_25to29            0.03831    0.74352   0.052   0.9590
## age_group_5_30to34           -0.26955    0.80144  -0.336   0.7373
## age_group_5_35to39           -0.26829    0.81171  -0.331   0.7416
## age_group_5_40to44           -0.08304    0.82749  -0.100   0.9203
## age_group_5_45to49           -0.04014    0.78780  -0.051   0.9595
## age_group_5_50to54           -0.45702    0.79711  -0.573   0.5676
```

```
## age_group_5_55to59            -0.39395    0.82907  -0.475   0.6356
## age_group_5_60to64             1.47233    1.03429   1.424   0.1575
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.511 on 107 degrees of freedom
## Multiple R-squared:  0.1014, Adjusted R-squared:  0.009067
## F-statistic: 1.098 on 11 and 107 DF,  p-value: 0.3699
```

```
linearMod35 <- lm(formula = performance_rating ~ gender_Female + gender_Male, data=merit_raises_combine
summary(linearMod35)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.59767 -0.26943 -0.09767  0.25882  0.90233
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.49767    0.05346  65.428   <2e-16 ***
## gender_Female  0.04350    0.06830   0.637    0.526
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3505 on 109 degrees of freedom
##   (8 observations deleted due to missingness)
## Multiple R-squared:  0.003708,   Adjusted R-squared:  -0.005432
## F-statistic: 0.4057 on 1 and 109 DF,  p-value: 0.5255
```

```
linearMod36 <- lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color, da
summary(linearMod36)
```

```
##
## Call:
## lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.67467 -0.27467 -0.01944  0.22533  0.82533
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.41944    0.05724  59.735   <2e-16 ***
## race_grouping_white            0.15522    0.06964   2.229   0.0279 *
## race_grouping_person_of_color       NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 0.3435 on 109 degrees of freedom
##   (8 observations deleted due to missingness)
## Multiple R-squared:  0.04359,    Adjusted R-squared:  0.03482
## F-statistic: 4.968 on 1 and 109 DF,  p-value: 0.02787
```

```
linearMod37 <- lm(formula = performance_rating ~ gender_Female + gender_Male + race_grouping_white + rac
summary(linearMod37)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = merit_raises_combined_hourly_regressi
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.66495 -0.27924 -0.02699  0.23505  0.83505
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.41270    0.06599  51.713   <2e-16 ***
## gender_Female                  0.01429    0.06860   0.208   0.8354
## gender_Male                         NA         NA      NA       NA
## race_grouping_white            0.15225    0.07138   2.133   0.0352 *
## race_grouping_person_of_color       NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.345 on 108 degrees of freedom
##   (8 observations deleted due to missingness)
## Multiple R-squared:  0.04398,    Adjusted R-squared:  0.02627
## F-statistic: 2.484 on 2 and 108 DF,  p-value: 0.08817
```

```
linearMod38 <- lm(formula = performance_rating ~ gender_Female + gender_Male + age_group_5_under_25 + ag
summary(linearMod38)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.77659 -0.26798 -0.07659  0.22153  0.74303
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)           3.52255    0.16374  21.512   <2e-16 ***
## gender_Female         0.04682    0.07343   0.638    0.525
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25 -0.24596    0.28679  -0.858    0.393
## age_group_5_25to29   -0.08878    0.16801  -0.528    0.598
## age_group_5_30to34   -0.04220    0.17780  -0.237    0.813
```

```
## age_group_5_35to39   -0.21655    0.18607  -1.164    0.247
## age_group_5_40to44    0.25404    0.18325   1.386    0.169
## age_group_5_45to49   -0.01376    0.17676  -0.078    0.938
## age_group_5_50to54    0.01885    0.18008   0.105    0.917
## age_group_5_55to59    0.03442    0.19241   0.179    0.858
## age_group_5_60to64   -0.22042    0.24978  -0.882    0.380
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3418 on 100 degrees of freedom
##   (8 observations deleted due to missingness)
## Multiple R-squared:  0.1312, Adjusted R-squared:  0.04432
## F-statistic:  1.51 on 10 and 100 DF,  p-value: 0.1468
```

```
linearMod39 <- lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color + a
summary(linearMod39)
```

```
##
## Call:
## lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.68218 -0.24318 -0.04153  0.19243  0.69655
##
## Coefficients: (2 not defined because of singularities)
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     3.50345    0.15323  22.865   <2e-16 ***
## race_grouping_white             0.14139    0.07338   1.927   0.0569 .
## race_grouping_person_of_color        NA         NA      NA       NA
## age_group_5_under_25           -0.34483    0.28477  -1.211   0.2288
## age_group_5_25to29             -0.10331    0.16547  -0.624   0.5339
## age_group_5_30to34             -0.13408    0.17470  -0.767   0.4446
## age_group_5_35to39             -0.24044    0.18142  -1.325   0.1881
## age_group_5_40to44              0.17873    0.18180   0.983   0.3279
## age_group_5_45to49             -0.05770    0.17475  -0.330   0.7419
## age_group_5_50to54             -0.02759    0.17902  -0.154   0.8778
## age_group_5_55to59             -0.01993    0.18858  -0.106   0.9161
## age_group_5_60to64             -0.31150    0.24950  -1.249   0.2148
## age_group_5_65_over                  NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3363 on 100 degrees of freedom
##   (8 observations deleted due to missingness)
## Multiple R-squared:  0.1589, Adjusted R-squared:  0.07478
## F-statistic: 1.889 on 10 and 100 DF,  p-value: 0.05533
```

```
linearMod40 <- lm(formula = performance_rating ~ gender_Female + gender_Male + race_grouping_white + rac
summary(linearMod40)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.68129 -0.24287 -0.04171  0.19235  0.69532
##
## Coefficients: (3 not defined because of singularities)
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.500910   0.162366  21.562   <2e-16 ***
## gender_Female                  0.003766   0.076429   0.049   0.9608
## gender_Male                          NA         NA      NA       NA
## race_grouping_white            0.140193   0.077622   1.806   0.0739 .
## race_grouping_person_of_color        NA         NA      NA       NA
## age_group_5_under_25          -0.342986   0.288645  -1.188   0.2376
## age_group_5_25to29            -0.103155   0.166335  -0.620   0.5366
## age_group_5_30to34            -0.131600   0.182655  -0.720   0.4729
## age_group_5_35to39            -0.239073   0.184425  -1.296   0.1979
## age_group_5_40to44             0.180380   0.185744   0.971   0.3339
## age_group_5_45to49            -0.056883   0.176417  -0.322   0.7478
## age_group_5_50to54            -0.027612   0.179923  -0.153   0.8783
## age_group_5_55to59            -0.018268   0.192492  -0.095   0.9246
## age_group_5_60to64            -0.310280   0.251966  -1.231   0.2211
## age_group_5_65_over                  NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.338 on 99 degrees of freedom
##   (8 observations deleted due to missingness)
## Multiple R-squared:  0.1589, Adjusted R-squared:  0.06545
## F-statistic:   1.7 on 11 and 99 DF,  p-value: 0.08412
```

Commercial

Gender

```
current_commercial_gender_salaried <- commercial_salaried %>% group_by(gender)
current_commercial_gender_salaried <- current_commercial_gender_salaried %>% summarise(
  count = length(current_base_pay)
)
suppress(current_commercial_gender_salaried)
```

```
## # A tibble: 2 x 2
##   gender count
##   <chr>  <int>
## 1 Female    86
## 2 Male      47
```

```r
current_commercial_gender_hourly <- commercial_hourly %>% group_by(gender)
current_commercial_gender_hourly <- current_commercial_gender_hourly %>% summarise(
  count = length(current_base_pay)
)
suppress(current_commercial_gender_hourly)
```

```
## # A tibble: 2 x 2
##   gender count
##   <chr>  <int>
## 1 Female    74
## 2 Male      73
```

```r
current_commercial_gender_salaried_median <- commercial_salaried %>% group_by(gender)
current_commercial_gender_salaried_median <- current_commercial_gender_salaried_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_salaried_median)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    86 85977.
## 2 Male      47 86880
```

```r
current_commercial_gender_hourly_median <- commercial_hourly %>% group_by(gender)
current_commercial_gender_hourly_median <- current_commercial_gender_hourly_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_hourly_median)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    74   28.9
## 2 Male      73   23.4
```

```r
current_commercial_gender_age_salaried <- commercial_salaried %>% group_by(gender)
current_commercial_gender_age_salaried %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 2 x 2
##   gender median_age
##   <chr>       <dbl>
## 1 Female         32
## 2 Male           39
```

```r
current_commercial_gender_age_hourly <- commercial_hourly %>% group_by(gender)
current_commercial_gender_age_hourly %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 2 x 2
##   gender median_age
##   <chr>       <dbl>
```

```
## 1 Female       43.5
## 2 Male         47
```

```
current_commercial_gender_age_5_salary <- commercial_salaried %>% group_by(age_group_5, gender)
current_commercial_gender_age_5_salary <- current_commercial_gender_age_5_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_age_5_salary)
```

```
## # A tibble: 14 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 gender count  median
##    <fct>       <chr>  <int>   <dbl>
##  1 <25         Female     8  63500
##  2 25-29       Female    29  75000
##  3 25-29       Male       6  79140
##  4 30-34       Female     9 100000
##  5 30-34       Male       7  97696.
##  6 35-39       Female     9 149101
##  7 35-39       Male       9  77627.
##  8 40-44       Female     8 124288.
##  9 45-49       Female     7  90585
## 10 45-49       Male       6  85090.
## 11 50-54       Female     7  90669.
## 12 55-59       Female     5  96780
## 13 55-59       Male       5  97135.
## 14 60-64       Male       6  95754.
```

```
current_commercial_gender_age_5_hourly <- commercial_hourly %>% group_by(age_group_5, gender)
current_commercial_gender_age_5_hourly <- current_commercial_gender_age_5_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_age_5_hourly)
```

```
## # A tibble: 18 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 gender count median
##    <fct>       <chr>  <int>  <dbl>
##  1 <25         Male       7   23.1
##  2 25-29       Female    14   31.8
##  3 25-29       Male       8   26.2
##  4 30-34       Female     6   30.3
##  5 35-39       Female     5   30.8
##  6 35-39       Male       8   30.6
##  7 40-44       Female    12   29.5
##  8 40-44       Male       5   21.5
##  9 45-49       Female     7   31.3
## 10 45-49       Male      10   22.4
## 11 50-54       Female     6   23.3
## 12 50-54       Male      12   24.1
## 13 55-59       Female     9   26.4
## 14 55-59       Male       7   23.4
## 15 60-64       Female     6   24.5
```

```
## 16 60-64       Male       7   24.3
## 17 65+         Female     5   27.7
## 18 65+         Male       6   22.7
```

```
current_commercial_gender_age_10_salary <- commercial_salaried %>% group_by(age_group_10, gender)
current_commercial_gender_age_10_salary <- current_commercial_gender_age_10_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_age_10_salary)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 gender count  median
##   <fct>        <chr>  <int>   <dbl>
## 1 <25          Female     8  63500
## 2 25-34        Female    38  80212
## 3 25-34        Male      13  86880
## 4 35-44        Female    17 143576.
## 5 35-44        Male      10  84029.
## 6 45-54        Female    14  90627.
## 7 45-54        Male       9  85000
## 8 55-64        Female     9  96780
## 9 55-64        Male      11  97135.
```

```
current_commercial_gender_age_10_hourly <- commercial_hourly %>% group_by(age_group_10, gender)
current_commercial_gender_age_10_hourly <- current_commercial_gender_age_10_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_age_10_hourly)
```

```
## # A tibble: 11 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 gender count median
##    <fct>        <chr>  <int>  <dbl>
##  1 <25          Male       7   23.1
##  2 25-34        Female    20   31.0
##  3 25-34        Male      11   26.0
##  4 35-44        Female    17   29.7
##  5 35-44        Male      13   27.2
##  6 45-54        Female    13   26.1
##  7 45-54        Male      22   23.5
##  8 55-64        Female    15   25.4
##  9 55-64        Male      14   23.9
## 10 65+          Female     5   27.7
## 11 65+          Male       6   22.7
```

```
current_commercial_gender_salaried_under_40 <- filter(commercial_salaried, age < 40) %>% group_by(gende
current_commercial_gender_salaried_under_40 <- current_commercial_gender_salaried_under_40 %>% summaris
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_salaried_under_40)
```

```
## # A tibble: 2 x 3
```

```
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    55  80424
## 2 Male      24  83140
```

```
current_commercial_gender_salaried_over_40 <- filter(commercial_salaried, age > 39) %>% group_by(gender)
current_commercial_gender_salaried_over_40 <- current_commercial_gender_salaried_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_salaried_over_40)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    31  96780
## 2 Male      23  90000
```

```
current_commercial_gender_hourly_under_40 <- filter(commercial_hourly, age < 40) %>% group_by(gender)
current_commercial_gender_hourly_under_40 <- current_commercial_gender_hourly_under_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_hourly_under_40)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    29   30.4
## 2 Male      26   26.5
```

```
current_commercial_gender_hourly_over_40 <- filter(commercial_hourly, age > 39) %>% group_by(gender)
current_commercial_gender_hourly_over_40 <- current_commercial_gender_hourly_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_gender_hourly_over_40)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    45   27.7
## 2 Male      47   23.2
```

Race and ethnicity

```
current_commercial_race_salaried <- commercial_salaried %>% group_by(race_ethnicity)
current_commercial_race_salaried <- current_commercial_race_salaried %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_commercial_race_salaried)
```

```
## # A tibble: 4 x 2
##   race_ethnicity                                          count
##   <chr>                                                   <int>
## 1 White (United States of America)                           99
```

```
## 2 Black or African American (United States of America)    14
## 3 Asian (United States of America)                         13
## 4 Hispanic or Latino (United States of America)             5
```

```
current_commercial_race_hourly <- commercial_hourly %>% group_by(race_ethnicity)
current_commercial_race_hourly <- current_commercial_race_hourly %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_commercial_race_hourly)
```

```
## # A tibble: 4 x 2
##   race_ethnicity                                           count
##   <chr>                                                    <int>
## 1 Black or African American (United States of America)    82
## 2 White (United States of America)                         43
## 3 Hispanic or Latino (United States of America)             9
## 4 Asian (United States of America)                          7
```

```
current_commercial_race_group_salaried <- commercial_salaried %>% group_by(race_grouping)
current_commercial_race_group_salaried <- current_commercial_race_group_salaried %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_commercial_race_group_salaried)
```

```
## # A tibble: 2 x 2
##   race_grouping   count
##   <chr>           <int>
## 1 white              99
## 2 person of color    32
```

```
current_commercial_race_group_hourly <- commercial_hourly %>% group_by(race_grouping)
current_commercial_race_group_hourly <- current_commercial_race_group_hourly %>% summarise(
  count = length(current_base_pay)
)
suppress_count(current_commercial_race_group_hourly)
```

```
## # A tibble: 2 x 2
##   race_grouping   count
##   <chr>           <int>
## 1 person of color   101
## 2 white              43
```

```
current_commercial_race_salaried_median <- commercial_salaried %>% group_by(race_ethnicity)
current_commercial_race_salaried_median <- current_commercial_race_salaried_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_race_salaried_median)
```

```
## # A tibble: 4 x 3
##   race_ethnicity                                           count median
##   <chr>                                                    <int>  <dbl>
## 1 White (United States of America)                            99  88000
## 2 Black or African American (United States of America)    14  84640
## 3 Asian (United States of America)                          13  80000
## 4 Hispanic or Latino (United States of America)              5  80000
```

```r
current_commercial_race_hourly_median <- commercial_hourly %>% group_by(race_ethnicity)
current_commercial_race_hourly_median <- current_commercial_race_hourly_median %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_race_hourly_median)
```

```
## # A tibble: 4 x 3
##   race_ethnicity                                          count median
##   <chr>                                                   <int>  <dbl>
## 1 White (United States of America)                           43   30.4
## 2 Asian (United States of America)                            7   26.0
## 3 Black or African American (United States of America)       82   24.9
## 4 Hispanic or Latino (United States of America)               9   23.1
```

```r
current_commercial_race_group_salaried_median <- commercial_salaried %>% group_by(race_grouping)
current_commercial_race_group_salaried_median <- current_commercial_race_group_salaried_median %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_race_group_salaried_median)
```

```
## # A tibble: 2 x 3
##   race_grouping   count median
##   <chr>           <int>  <dbl>
## 1 white              99 88000
## 2 person of color    32 83445.
```

```r
current_commercial_race_group_hourly_median <- commercial_hourly %>% group_by(race_grouping)
current_commercial_race_group_hourly_median <- current_commercial_race_group_hourly_median %>% summarise
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_race_group_hourly_median)
```

```
## # A tibble: 2 x 3
##   race_grouping   count median
##   <chr>           <int>  <dbl>
## 1 white              43   30.4
## 2 person of color   101   25.2
```

```r
current_commercial_race_age_salaried <- commercial_salaried %>% group_by(race_ethnicity)
current_commercial_race_age_salaried %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 5 x 2
##   race_ethnicity                                          median_age
##   <chr>                                                        <dbl>
## 1 Asian (United States of America)                              32
## 2 Black or African American (United States of America)          48
## 3 Hispanic or Latino (United States of America)                 41
## 4 Prefer Not to Disclose (United States of America)             35.5
## 5 White (United States of America)                              35
```

```r
current_commercial_race_age_hourly <- commercial_hourly %>% group_by(race_ethnicity)
current_commercial_race_age_hourly %>% summarise(
  median_age = median(age)
)
```

```
## # A tibble: 7 x 2
##   race_ethnicity                                                  median_age
##   <chr>                                                                <dbl>
## 1 American Indian or Alaska Native (United States of America)           38
## 2 Asian (United States of America)                                      28
## 3 Black or African American (United States of America)                  48.5
## 4 Hispanic or Latino (United States of America)                         30
## 5 Prefer Not to Disclose (United States of America)                     35
## 6 Two or More Races (United States of America)                          31
## 7 White (United States of America)                                      39
```

```r
current_commercial_race_age_5_salary <- commercial_salaried %>% group_by(age_group_5, race_ethnicity)
current_commercial_race_age_5_salary <- current_commercial_race_age_5_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_age_5_salary)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_5 [9]
##   age_group_5 race_ethnicity                   count  median
##   <fct>       <chr>                            <int>   <dbl>
## 1 <25         White (United States of America)     9  63000
## 2 25-29       White (United States of America)    28  78692.
## 3 30-34       White (United States of America)    12  98848.
## 4 35-39       White (United States of America)    13 149101
## 5 40-44       White (United States of America)     6 126865.
## 6 45-49       White (United States of America)     7  90000
## 7 50-54       White (United States of America)     9  87392.
## 8 55-59       White (United States of America)     8  96957.
## 9 60-64       White (United States of America)     6  97651.
```

```r
current_commercial_race_age_5_hourly <- commercial_hourly %>% group_by(age_group_5, race_ethnicity)
current_commercial_race_age_5_hourly <- current_commercial_race_age_5_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_age_5_hourly)
```

```
## # A tibble: 11 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 race_ethnicity                                 count median
##    <fct>       <chr>                                          <int>  <dbl>
##  1 <25         Black or African American (United States of Am~     5   22.4
##  2 25-29       White (United States of America)                   11   31.8
##  3 35-39       White (United States of America)                    6   30.8
##  4 40-44       Black or African American (United States of Am~    13   28.9
##  5 45-49       Black or African American (United States of Am~    14   23.1
##  6 50-54       Black or African American (United States of Am~    12   23.3
##  7 50-54       White (United States of America)                    5   24.4
```

```
## 8 55-59       Black or African American (United States of Am~    11   27.0
## 9 55-59       White (United States of America)                    5   25.4
## 10 60-64      Black or African American (United States of Am~    11   24.3
## 11 65+        Black or African American (United States of Am~     5   23.4
```

```r
current_commercial_race_age_10_salary <- commercial_salaried %>% group_by(age_group_10, race_ethnicity)
current_commercial_race_age_10_salary <- current_commercial_race_age_10_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_age_10_salary)
```

```
## # A tibble: 6 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 race_ethnicity                   count  median
##   <fct>        <chr>                            <int>   <dbl>
## 1 <25          White (United States of America)     9  63000
## 2 25-34        Asian (United States of America)     6  82418.
## 3 25-34        White (United States of America)    40  82000
## 4 35-44        White (United States of America)    19 148730.
## 5 45-54        White (United States of America)    16  88696.
## 6 55-64        White (United States of America)    14  97325.
```

```r
current_commercial_race_age_10_hourly <- commercial_hourly %>% group_by(age_group_10, race_ethnicity)
current_commercial_race_age_10_hourly <- current_commercial_race_age_10_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_age_10_hourly)
```

```
## # A tibble: 11 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 race_ethnicity                                  count median
##    <fct>        <chr>                                           <int>  <dbl>
##  1 <25          Black or African American (United States of A~     5   22.4
##  2 25-34        Black or African American (United States of A~     7   26.7
##  3 25-34        Hispanic or Latino (United States of America)      6   25.0
##  4 25-34        White (United States of America)                  12   31.8
##  5 35-44        Black or African American (United States of A~    17   29.2
##  6 35-44        White (United States of America)                   8   30.6
##  7 45-54        Black or African American (United States of A~    26   23.3
##  8 45-54        White (United States of America)                   8   30.8
##  9 55-64        Black or African American (United States of A~    22   24.5
## 10 55-64        White (United States of America)                   7   26.4
## 11 65+          Black or African American (United States of A~     5   23.4
```

```r
current_commercial_race_group_age_5_salary <- commercial_salaried %>% group_by(age_group_5, race_groupi
current_commercial_race_group_age_5_salary <- current_commercial_race_group_age_5_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_group_age_5_salary)
```

```
## # A tibble: 12 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 race_grouping   count  median
```

```
##    <fct>       <chr>           <int>   <dbl>
##  1 <25         white               9  63000
##  2 25-29       person of color     7  72000
##  3 25-29       white              28  78692.
##  4 30-34       white              12  98848.
##  5 35-39       person of color     5  73522.
##  6 35-39       white              13 149101
##  7 40-44       white               6 126865.
##  8 45-49       person of color     6  85450.
##  9 45-49       white               7  90000
## 10 50-54       white               9  87392.
## 11 55-59       white               8  96957.
## 12 60-64       white               6  97651.
```

```
current_commercial_race_group_age_5_hourly <- commercial_hourly %>% group_by(age_group_5, race_grouping)
current_commercial_race_group_age_5_hourly <- current_commercial_race_group_age_5_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_group_age_5_hourly)
```

```
## # A tibble: 14 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 race_grouping   count median
##    <fct>       <chr>           <int>  <dbl>
##  1 <25         person of color     7   25.6
##  2 25-29       person of color    10   26.3
##  3 25-29       white              11   31.8
##  4 30-34       person of color     8   28.8
##  5 35-39       person of color     6   30.8
##  6 35-39       white               6   30.8
##  7 40-44       person of color    14   28.5
##  8 45-49       person of color    14   23.1
##  9 50-54       person of color    13   23.2
## 10 50-54       white               5   24.4
## 11 55-59       person of color    11   27.0
## 12 55-59       white               5   25.4
## 13 60-64       person of color    11   24.3
## 14 65+         person of color     7   23.4
```

```
current_commercial_race_group_age_10_salary <- commercial_salaried %>% group_by(age_group_10, race_grou
current_commercial_race_group_age_10_salary <- current_commercial_race_group_age_10_salary %>% summaris
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_group_age_10_salary)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 race_grouping   count  median
##   <fct>        <chr>           <int>   <dbl>
## 1 <25          white               9  63000
## 2 25-34        person of color    10  74918.
## 3 25-34        white              40  82000
## 4 35-44        person of color     7  90431.
```

```
## 5 35-44        white              19 148730.
## 6 45-54        person of color     7  85000
## 7 45-54        white              16  88696.
## 8 55-64        person of color     6  82709.
## 9 55-64        white              14  97325.
```

```
current_commercial_race_group_age_10_hourly <- commercial_hourly %>% group_by(age_group_10, race_groupi
current_commercial_race_group_age_10_hourly <- current_commercial_race_group_age_10_hourly %>% summaris
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_group_age_10_hourly)
```

```
## # A tibble: 10 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 race_grouping   count median
##    <fct>        <chr>           <int>  <dbl>
##  1 <25          person of color     7   25.6
##  2 25-34        person of color    18   26.5
##  3 25-34        white              12   31.8
##  4 35-44        person of color    20   29.1
##  5 35-44        white               8   30.6
##  6 45-54        person of color    27   23.2
##  7 45-54        white               8   30.8
##  8 55-64        person of color    22   24.5
##  9 55-64        white               7   26.4
## 10 65+          person of color     7   23.4
```

```
current_commercial_race_salaried_under_40 <- filter(commercial_salaried, age < 40) %>% group_by(race_et
current_commercial_race_salaried_under_40 <- current_commercial_race_salaried_under_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_race_salaried_under_40)
```

```
## # A tibble: 2 x 3
##   race_ethnicity                      count median
##   <chr>                               <int>  <dbl>
## 1 White (United States of America)       62 82000
## 2 Asian (United States of America)       10 77418.
```

```
current_commercial_race_salaried_over_40 <- filter(commercial_salaried, age > 39) %>% group_by(race_eth
current_commercial_race_salaried_over_40 <- current_commercial_race_salaried_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_race_salaried_over_40)
```

```
## # A tibble: 2 x 3
##   race_ethnicity                                        count median
##   <chr>                                                 <int>  <dbl>
## 1 White (United States of America)                         37 97135.
## 2 Black or African American (United States of America)    10 84849.
```

```
current_commercial_race_hourly_under_40 <- filter(commercial_hourly, age < 40) %>% group_by(race_ethnic
current_commercial_race_hourly_under_40 <- current_commercial_race_hourly_under_40 %>% summarise(
  count = length(current_base_pay),
```

```r
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_race_hourly_under_40)
```

```
## # A tibble: 3 x 3
##   race_ethnicity                                     count median
##   <chr>                                              <int>  <dbl>
## 1 White (United States of America)                      22   31.5
## 2 Black or African American (United States of America)    16   26.5
## 3 Hispanic or Latino (United States of America)          8   25.6
```

```r
current_commercial_race_hourly_over_40 <- filter(commercial_hourly, age > 39) %>% group_by(race_ethnici
current_commercial_race_hourly_over_40 <- current_commercial_race_hourly_over_40 %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_race_hourly_over_40)
```

```
## # A tibble: 2 x 3
##   race_ethnicity                                     count median
##   <chr>                                              <int>  <dbl>
## 1 White (United States of America)                      21   29.2
## 2 Black or African American (United States of America)    66   24.4
```

Gender x race/ethnicity

```r
current_commercial_race_gender_salaried <- commercial_salaried %>% group_by(race_ethnicity, gender)
current_commercial_race_gender_salaried <- current_commercial_race_gender_salaried %>% summarise(
  count = length(current_base_pay)
)
suppress(current_commercial_race_gender_salaried)
```

```
## # A tibble: 6 x 3
## # Groups:   race_ethnicity [3]
##   race_ethnicity                                       gender count
##   <chr>                                                <chr>  <int>
## 1 Asian (United States of America)                     Female     8
## 2 Asian (United States of America)                     Male       5
## 3 Black or African American (United States of America) Female     7
## 4 Black or African American (United States of America) Male       7
## 5 White (United States of America)                     Female    67
## 6 White (United States of America)                     Male      32
```

```r
current_commercial_race_gender_hourly <- commercial_hourly %>% group_by(race_ethnicity, gender)
current_commercial_race_gender_hourly <- current_commercial_race_gender_hourly %>% summarise(
  count = length(current_base_pay)
)
suppress(current_commercial_race_gender_hourly)
```

```
## # A tibble: 5 x 3
## # Groups:   race_ethnicity [3]
##   race_ethnicity                                       gender count
##   <chr>                                                <chr>  <int>
## 1 Black or African American (United States of America) Female    41
## 2 Black or African American (United States of America) Male      41
```

```
## 3 Hispanic or Latino (United States of America)        Female     6
## 4 White (United States of America)                     Female    22
## 5 White (United States of America)                     Male      21
```

```
current_commercial_race_gender_median_salaried <- commercial_salaried %>% group_by(race_ethnicity, gende
current_commercial_race_gender_median_salaried <- current_commercial_race_gender_median_salaried %>% su
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_gender_median_salaried)
```

```
## # A tibble: 6 x 4
## # Groups:   race_ethnicity [3]
##   race_ethnicity                                      gender count median
##   <chr>                                               <chr>  <int>  <dbl>
## 1 Asian (United States of America)                    Female     8 87500
## 2 Asian (United States of America)                    Male       5 74837.
## 3 Black or African American (United States of America) Female     7 90585
## 4 Black or African American (United States of America) Male       7 82609.
## 5 White (United States of America)                    Female    67 86105.
## 6 White (United States of America)                    Male      32 94497.
```

```
current_commercial_race_gender_hourly_median <- commercial_hourly %>% group_by(race_ethnicity, gender)
current_commercial_race_gender_hourly_median <- current_commercial_race_gender_hourly_median %>% summar
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_gender_hourly_median)
```

```
## # A tibble: 5 x 4
## # Groups:   race_ethnicity [3]
##   race_ethnicity                                      gender count median
##   <chr>                                               <chr>  <int>  <dbl>
## 1 Black or African American (United States of America) Female    41   26.3
## 2 Black or African American (United States of America) Male      41   23.3
## 3 Hispanic or Latino (United States of America)        Female     6   28.5
## 4 White (United States of America)                     Female    22   31.8
## 5 White (United States of America)                     Male      21   26.8
```

```
current_commercial_race_gender_salaried_under_40 <- filter(commercial_salaried, age < 40) %>% group_by(r
current_commercial_race_gender_salaried_under_40 <- current_commercial_race_gender_salaried_under_40 %>
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_gender_salaried_under_40)
```

```
## # A tibble: 3 x 4
## # Groups:   race_ethnicity [2]
##   race_ethnicity                   gender count median
##   <chr>                            <chr>  <int>  <dbl>
## 1 Asian (United States of America) Female     6  85000
## 2 White (United States of America) Female    46  80212
## 3 White (United States of America) Male      16  90940
```

```
current_commercial_race_gender_salaried_over_40 <- filter(commercial_salaried, age > 39) %>% group_by(ra
current_commercial_race_gender_salaried_over_40 <- current_commercial_race_gender_salaried_over_40 %>% s
```

```
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_gender_salaried_over_40)
```

```
## # A tibble: 3 x 4
## # Groups:   race_ethnicity [2]
##   race_ethnicity                                      gender count median
##   <chr>                                               <chr>  <int>  <dbl>
## 1 Black or African American (United States of America) Female     6 94950.
## 2 White (United States of America)                    Female    21 97546
## 3 White (United States of America)                    Male      16 95564.
```

```
current_commercial_race_gender_hourly_under_40 <- filter(commercial_hourly, age < 40) %>% group_by(race_
current_commercial_race_gender_hourly_under_40 <- current_commercial_race_gender_hourly_under_40 %>% su
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_gender_hourly_under_40)
```

```
## # A tibble: 5 x 4
## # Groups:   race_ethnicity [3]
##   race_ethnicity                                      gender count median
##   <chr>                                               <chr>  <int>  <dbl>
## 1 Black or African American (United States of America) Female     8   26.5
## 2 Black or African American (United States of America) Male       8   26.3
## 3 Hispanic or Latino (United States of America)       Female     6   28.5
## 4 White (United States of America)                    Female    12   33.3
## 5 White (United States of America)                    Male      10   30.6
```

```
current_commercial_race_gender_hourly_over_40 <- filter(commercial_hourly, age > 39) %>% group_by(race_e
current_commercial_race_gender_hourly_over_40 <- current_commercial_race_gender_hourly_over_40 %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_race_gender_hourly_over_40)
```

```
## # A tibble: 4 x 4
## # Groups:   race_ethnicity [2]
##   race_ethnicity                                      gender count median
##   <chr>                                               <chr>  <int>  <dbl>
## 1 Black or African American (United States of America) Female    33   26.1
## 2 Black or African American (United States of America) Male      33   23.1
## 3 White (United States of America)                    Female    10   31.0
## 4 White (United States of America)                    Male      11   23.8
```

Years of service

```
current_commercial_yos_salaried <- commercial_salaried %>% group_by(years_of_service_grouped)
current_commercial_yos_salaried <- current_commercial_yos_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_yos_salaried)
```

```
## # A tibble: 8 x 3
##   years_of_service_grouped count median
##   <fct>                    <int>  <dbl>
## 1 0                           31 82000
## 2 1-2                         36 80212
## 3 3-5                         26 95770.
## 4 6-10                        15 99316
## 5 11-15                        6 76331.
## 6 16-20                        6 81766.
## 7 21-25                        8 94007.
## 8 25+                          5 93491.
```

```r
current_commercial_yos_hourly <- commercial_hourly %>% group_by(years_of_service_grouped)
current_commercial_yos_hourly <- current_commercial_yos_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_yos_hourly)
```

```
## # A tibble: 8 x 3
##   years_of_service_grouped count median
##   <fct>                    <int>  <dbl>
## 1 0                           26   25.6
## 2 1-2                         33   27.0
## 3 3-5                         14   23.2
## 4 6-10                        19   24.0
## 5 11-15                       14   30.2
## 6 16-20                       17   24.3
## 7 21-25                        9   29.7
## 8 25+                         15   26.3
```

```r
current_commercial_yos_gender_salaried <- commercial_salaried %>% group_by(years_of_service_grouped, ger
current_commercial_yos_gender_salaried <- current_commercial_yos_gender_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_yos_gender_salaried)
```

```
## # A tibble: 8 x 4
## # Groups:   years_of_service_grouped [5]
##   years_of_service_grouped gender count  median
##   <fct>                    <chr>  <int>   <dbl>
## 1 0                        Female    22  74640
## 2 0                        Male       9  90000
## 3 1-2                      Female    26  80212
## 4 1-2                      Male      10  81640
## 5 3-5                      Female    16  94108.
## 6 3-5                      Male      10 102497.
## 7 6-10                     Female    12  99500.
## 8 21-25                    Male       6  91466.
```

```r
current_commercial_yos_gender_hourly <- commercial_hourly %>% group_by(years_of_service_grouped, gender)
current_commercial_yos_gender_hourly <- current_commercial_yos_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
```

```r
suppress(current_commercial_yos_gender_hourly)
```

```
## # A tibble: 13 x 4
## # Groups:   years_of_service_grouped [8]
##    years_of_service_grouped gender count median
##    <fct>                    <chr>  <int>  <dbl>
##  1 0                        Female    10   29.5
##  2 0                        Male      16   22.0
##  3 1-2                      Female    18   30.3
##  4 1-2                      Male      15   24.4
##  5 3-5                      Female     5   30.8
##  6 3-5                      Male       9   22.1
##  7 6-10                     Female     5   26.3
##  8 6-10                     Male      14   23.6
##  9 11-15                    Male      10   29.0
## 10 16-20                    Female    10   24.2
## 11 16-20                    Male       7   27.3
## 12 21-25                    Female     8   27.9
## 13 25+                      Female    14   26.6
```

```r
current_commercial_yos_race_salaried <- commercial_salaried %>% group_by(years_of_service_grouped, race_
current_commercial_yos_race_salaried <- current_commercial_yos_race_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_yos_race_salaried)
```

```
## # A tibble: 6 x 4
## # Groups:   years_of_service_grouped [6]
##   years_of_service_grouped race_ethnicity                   count  median
##   <fct>                    <chr>                            <int>   <dbl>
## 1 0                        White (United States of America)    23  82000
## 2 1-2                      White (United States of America)    30  80212
## 3 3-5                      White (United States of America)    19 108780
## 4 6-10                     White (United States of America)    11 102500
## 5 16-20                    White (United States of America)     5  87392.
## 6 21-25                    White (United States of America)     6  97651.
```

```r
current_commercial_yos_race_hourly <- commercial_hourly %>% group_by(years_of_service_grouped, race_ethn
current_commercial_yos_race_hourly <- current_commercial_yos_race_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_yos_race_hourly)
```

```
## # A tibble: 13 x 4
## # Groups:   years_of_service_grouped [8]
##    years_of_service_gro~ race_ethnicity                        count median
##    <fct>                 <chr>                                 <int>  <dbl>
##  1 0                     Black or African American (United St~    11   25.6
##  2 0                     White (United States of America)          6   29.5
##  3 1-2                   Black or African American (United St~    14   23.6
##  4 1-2                   White (United States of America)         13   34.7
##  5 3-5                   Black or African American (United St~     6   21.8
##  6 3-5                   White (United States of America)          5   23.2
```

```
##  7 6-10                  Black or African American (United St~    12   23.6
##  8 6-10                  White (United States of America)          6   29.9
##  9 11-15                 Black or African American (United St~     7   30.4
## 10 11-15                 White (United States of America)          6   26.0
## 11 16-20                 Black or African American (United St~    12   24.1
## 12 21-25                 Black or African American (United St~     9   29.7
## 13 25+                   Black or African American (United St~    11   24.7
```

```
current_commercial_yos_race_gender_salaried <- commercial_salaried %>% group_by(years_of_service_groupe
current_commercial_yos_race_gender_salaried <- current_commercial_yos_race_gender_salaried %>% summarise
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_yos_race_gender_salaried)
```

```
## # A tibble: 7 x 5
## # Groups:   years_of_service_grouped, race_ethnicity [4]
##   years_of_service_group~ race_ethnicity                  gender count median
##   <fct>                   <chr>                           <chr>  <int>  <dbl>
## 1 0                       White (United States of Amer~ Female    15 7.43e4
## 2 0                       White (United States of Amer~ Male       8 9.25e4
## 3 1-2                     White (United States of Amer~ Female    21 7.74e4
## 4 1-2                     White (United States of Amer~ Male       9 8.33e4
## 5 3-5                     White (United States of Amer~ Female    14 9.41e4
## 6 3-5                     White (United States of Amer~ Male       5 1.26e5
## 7 6-10                    White (United States of Amer~ Female    10 1.01e5
```

```
current_commercial_yos_race_gender_hourly <- commercial_hourly %>% group_by(years_of_service_grouped, ra
current_commercial_yos_race_gender_hourly <- current_commercial_yos_race_gender_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_yos_race_gender_hourly)
```

```
## # A tibble: 11 x 5
## # Groups:   years_of_service_grouped, race_ethnicity [10]
##    years_of_service_gr~ race_ethnicity                  gender count median
##    <fct>                <chr>                           <chr>  <int>  <dbl>
##  1 0                    Black or African American (Uni~ Male       7   20.6
##  2 1-2                  Black or African American (Uni~ Female     6   25.8
##  3 1-2                  Black or African American (Uni~ Male       8   21.9
##  4 1-2                  White (United States of Americ~ Female     9   35.0
##  5 3-5                  Black or African American (Uni~ Male       5   21.5
##  6 6-10                 Black or African American (Uni~ Male      10   23.4
##  7 11-15                Black or African American (Uni~ Male       5   29.9
##  8 11-15                White (United States of Americ~ Male       5   26.8
##  9 16-20                Black or African American (Uni~ Female     8   23.7
## 10 21-25                Black or African American (Uni~ Female     8   27.9
## 11 25+                  Black or African American (Uni~ Female    10   25.5
```

Age

```
current_median_commercial_age_5_salaried <- commercial_salaried %>% group_by(age_group_5)
current_median_commercial_age_5_salaried <- current_median_commercial_age_5_salaried %>% summarise(
  count = length(current_base_pay),
```

```
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_salaried)
```

```
## # A tibble: 9 x 3
##   age_group_5 count  median
##   <fct>       <int>   <dbl>
## 1 <25            10  64000
## 2 25-29          35  75000
## 3 30-34          16  98848.
## 4 35-39          18 101092.
## 5 40-44           9 143576.
## 6 45-49          13  86105.
## 7 50-54          10  87002.
## 8 55-59          10  96957.
## 9 60-64          10  95754.
```

```
current_median_commercial_age_5_hourly <- commercial_hourly %>% group_by(age_group_5)
current_median_commercial_age_5_hourly <- current_median_commercial_age_5_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_hourly)
```

```
## # A tibble: 10 x 3
##    age_group_5 count median
##    <fct>       <int>  <dbl>
##  1 <25            11   25.6
##  2 25-29          22   29.8
##  3 30-34           9   29.5
##  4 35-39          13   30.8
##  5 40-44          17   28.9
##  6 45-49          17   24.0
##  7 50-54          18   23.6
##  8 55-59          16   26.2
##  9 60-64          13   24.3
## 10 65+            11   23.4
```

```
current_median_commercial_age_10_salaried <- commercial_salaried %>% group_by(age_group_10)
current_median_commercial_age_10_salaried <- current_median_commercial_age_10_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_salaried)
```

```
## # A tibble: 5 x 3
##   age_group_10 count  median
##   <fct>        <int>   <dbl>
## 1 <25             10  64000
## 2 25-34           51  82000
## 3 35-44           27 105000
## 4 45-54           23  86613
## 5 55-64           20  96957.
```

```
current_median_commercial_age_10_hourly <- commercial_hourly %>% group_by(age_group_10)
```

```
current_median_commercial_age_10_hourly <- current_median_commercial_age_10_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_hourly)
```

```
## # A tibble: 6 x 3
##   age_group_10 count median
##   <fct>        <int>  <dbl>
## 1 <25             11   25.6
## 2 25-34           31   29.5
## 3 35-44           30   29.2
## 4 45-54           35   23.8
## 5 55-64           29   24.7
## 6 65+             11   23.4
```

```
current_commercial_age_5_yos_salary <- commercial_salaried %>% group_by(age_group_5, years_of_service_gr
current_commercial_age_5_yos_salary <- current_commercial_age_5_yos_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_age_5_yos_salary)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_5 [6]
##   age_group_5 years_of_service_grouped count  median
##   <fct>       <fct>                    <int>   <dbl>
## 1 <25         0                            6  62500
## 2 25-29       0                           14  75000
## 3 25-29       1-2                         17  76000
## 4 30-34       0                            6 100000
## 5 30-34       1-2                          7  96980
## 6 35-39       3-5                          7 149101
## 7 35-39       6-10                         6 101092.
## 8 40-44       3-5                          5 167000
## 9 60-64       21-25                        5  97514.
```

```
current_commercial_age_5_yos_hourly <- commercial_hourly %>% group_by(age_group_5, years_of_service_grou
current_commercial_age_5_yos_hourly <- current_commercial_age_5_yos_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_age_5_yos_hourly)
```

```
## # A tibble: 10 x 4
## # Groups:   age_group_5 [8]
##    age_group_5 years_of_service_grouped count median
##    <fct>       <fct>                    <int>  <dbl>
##  1 <25         0                            5   23.1
##  2 <25         1-2                          6   27.9
##  3 25-29       0                            6   33.3
##  4 25-29       1-2                         15   26.7
##  5 30-34       0                            5   22.0
##  6 35-39       11-15                        5   30.4
##  7 40-44       3-5                          5   29.2
```

```
##  8 55-59       25+                           6   27.9
##  9 60-64       16-20                         5   24.3
## 10 65+         25+                           5   26.8
```

```r
current_commercial_age_10_yos_salary <- commercial_salaried %>% group_by(age_group_10, years_of_service
current_commercial_age_10_yos_salary <- current_commercial_age_10_yos_salary %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_age_10_yos_salary)
```

```
## # A tibble: 8 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 years_of_service_grouped count  median
##   <fct>        <fct>                    <int>   <dbl>
## 1 <25          0                            6   62500
## 2 25-34        0                           20   82000
## 3 25-34        1-2                         24   80810.
## 4 25-34        3-5                          5   85850
## 5 35-44        3-5                         12 158050.
## 6 35-44        6-10                         6 101092.
## 7 45-54        3-5                          5   86613
## 8 55-64        21-25                        5   97514.
```

```r
current_commercial_age_10_yos_hourly <- commercial_hourly %>% group_by(age_group_10, years_of_service_g
current_commercial_age_10_yos_hourly <- current_commercial_age_10_yos_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_commercial_age_10_yos_hourly)
```

```
## # A tibble: 15 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 years_of_service_grouped count median
##    <fct>        <fct>                    <int>  <dbl>
##  1 <25          0                            5   23.1
##  2 <25          1-2                          6   27.9
##  3 25-34        0                           11   30.3
##  4 25-34        1-2                         15   26.7
##  5 35-44        0                            5   29.2
##  6 35-44        3-5                          6   26.2
##  7 35-44        11-15                        7   30.4
##  8 45-54        0                            5   20.5
##  9 45-54        1-2                          5   22.4
## 10 45-54        6-10                         7   23.8
## 11 45-54        16-20                        6   28.3
## 12 55-64        6-10                         6   23.4
## 13 55-64        16-20                        6   24.3
## 14 55-64        25+                          8   27.9
## 15 65+          25+                          5   26.8
```

```r
current_median_commercial_age_5_gender_salaried <- commercial_salaried %>% group_by(age_group_5, gender
current_median_commercial_age_5_gender_salaried <- current_median_commercial_age_5_gender_salaried %>% s
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
```

```
suppress(current_median_commercial_age_5_gender_salaried)
```

```
## # A tibble: 14 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 gender count  median
##    <fct>       <chr>  <int>   <dbl>
##  1 <25         Female     8  63500
##  2 25-29       Female    29  75000
##  3 25-29       Male       6  79140
##  4 30-34       Female     9 100000
##  5 30-34       Male       7  97696.
##  6 35-39       Female     9 149101
##  7 35-39       Male       9  77627.
##  8 40-44       Female     8 124288.
##  9 45-49       Female     7  90585
## 10 45-49       Male       6  85090.
## 11 50-54       Female     7  90669.
## 12 55-59       Female     5  96780
## 13 55-59       Male       5  97135.
## 14 60-64       Male       6  95754.
```

```
current_median_commercial_age_5_gender_hourly <- commercial_hourly %>% group_by(age_group_5, gender)
current_median_commercial_age_5_gender_hourly <- current_median_commercial_age_5_gender_hourly %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_gender_hourly)
```

```
## # A tibble: 18 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 gender count median
##    <fct>       <chr>  <int>  <dbl>
##  1 <25         Male       7   23.1
##  2 25-29       Female    14   31.8
##  3 25-29       Male       8   26.2
##  4 30-34       Female     6   30.3
##  5 35-39       Female     5   30.8
##  6 35-39       Male       8   30.6
##  7 40-44       Female    12   29.5
##  8 40-44       Male       5   21.5
##  9 45-49       Female     7   31.3
## 10 45-49       Male      10   22.4
## 11 50-54       Female     6   23.3
## 12 50-54       Male      12   24.1
## 13 55-59       Female     9   26.4
## 14 55-59       Male       7   23.4
## 15 60-64       Female     6   24.5
## 16 60-64       Male       7   24.3
## 17 65+         Female     5   27.7
## 18 65+         Male       6   22.7
```

```
current_median_commercial_age_10_gender_salaried <- commercial_salaried %>% group_by(age_group_10, gend
current_median_commercial_age_10_gender_salaried <- current_median_commercial_age_10_gender_salaried %>
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
```

```r
)
suppress(current_median_commercial_age_10_gender_salaried)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 gender count  median
##   <fct>        <chr>  <int>   <dbl>
## 1 <25          Female     8  63500
## 2 25-34        Female    38  80212
## 3 25-34        Male      13  86880
## 4 35-44        Female    17 143576.
## 5 35-44        Male      10  84029.
## 6 45-54        Female    14  90627.
## 7 45-54        Male       9  85000
## 8 55-64        Female     9  96780
## 9 55-64        Male      11  97135.
```

```r
current_median_commercial_age_10_gender_hourly <- commercial_hourly %>% group_by(age_group_10, gender)
current_median_commercial_age_10_gender_hourly <- current_median_commercial_age_10_gender_hourly %>% su
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_gender_hourly)
```

```
## # A tibble: 11 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 gender count median
##    <fct>        <chr>  <int>  <dbl>
##  1 <25          Male       7   23.1
##  2 25-34        Female    20   31.0
##  3 25-34        Male      11   26.0
##  4 35-44        Female    17   29.7
##  5 35-44        Male      13   27.2
##  6 45-54        Female    13   26.1
##  7 45-54        Male      22   23.5
##  8 55-64        Female    15   25.4
##  9 55-64        Male      14   23.9
## 10 65+          Female     5   27.7
## 11 65+          Male       6   22.7
```

```r
current_median_commercial_age_5_race_salaried <- commercial_salaried %>% group_by(age_group_5, race_ethn
current_median_commercial_age_5_race_salaried <- current_median_commercial_age_5_race_salaried %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_race_salaried)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_5 [9]
##   age_group_5 race_ethnicity                    count  median
##   <fct>       <chr>                             <int>   <dbl>
## 1 <25         White (United States of America)     9  63000
## 2 25-29       White (United States of America)    28  78692.
## 3 30-34       White (United States of America)    12  98848.
## 4 35-39       White (United States of America)    13 149101
```

```
## 5 40-44       White (United States of America)     6 126865.
## 6 45-49       White (United States of America)     7  90000
## 7 50-54       White (United States of America)     9  87392.
## 8 55-59       White (United States of America)     8  96957.
## 9 60-64       White (United States of America)     6  97651.
```

```
current_median_commercial_age_5_race_hourly <- commercial_hourly %>% group_by(age_group_5, race_ethnici
current_median_commercial_age_5_race_hourly <- current_median_commercial_age_5_race_hourly %>% summaris
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_race_hourly)
```

```
## # A tibble: 11 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 race_ethnicity                                 count median
##    <fct>       <chr>                                          <int>  <dbl>
##  1 <25         Black or African American (United States of Am~     5   22.4
##  2 25-29       White (United States of America)                  11   31.8
##  3 35-39       White (United States of America)                   6   30.8
##  4 40-44       Black or African American (United States of Am~    13   28.9
##  5 45-49       Black or African American (United States of Am~    14   23.1
##  6 50-54       Black or African American (United States of Am~    12   23.3
##  7 50-54       White (United States of America)                   5   24.4
##  8 55-59       Black or African American (United States of Am~    11   27.0
##  9 55-59       White (United States of America)                   5   25.4
## 10 60-64       Black or African American (United States of Am~    11   24.3
## 11 65+         Black or African American (United States of Am~     5   23.4
```

```
current_median_commercial_age_10_race_salaried <- commercial_salaried %>% group_by(age_group_10, race_et
current_median_commercial_age_10_race_salaried <- current_median_commercial_age_10_race_salaried %>% su
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_race_salaried)
```

```
## # A tibble: 6 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 race_ethnicity                   count  median
##   <fct>        <chr>                            <int>   <dbl>
## 1 <25          White (United States of America)     9  63000
## 2 25-34        Asian (United States of America)     6  82418.
## 3 25-34        White (United States of America)    40  82000
## 4 35-44        White (United States of America)    19 148730.
## 5 45-54        White (United States of America)    16  88696.
## 6 55-64        White (United States of America)    14  97325.
```

```
current_median_commercial_age_10_race_hourly <- commercial_hourly %>% group_by(age_group_10, race_ethni
current_median_commercial_age_10_race_hourly <- current_median_commercial_age_10_race_hourly %>% summar
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_race_hourly)
```

```
## # A tibble: 11 x 4
## # Groups:   age_group_10 [6]
```

```
##    age_group_10 race_ethnicity                                  count median
##    <fct>        <chr>                                           <int>  <dbl>
##  1 <25          Black or African American (United States of A~     5   22.4
##  2 25-34        Black or African American (United States of A~     7   26.7
##  3 25-34        Hispanic or Latino (United States of America)      6   25.0
##  4 25-34        White (United States of America)                  12   31.8
##  5 35-44        Black or African American (United States of A~    17   29.2
##  6 35-44        White (United States of America)                   8   30.6
##  7 45-54        Black or African American (United States of A~    26   23.3
##  8 45-54        White (United States of America)                   8   30.8
##  9 55-64        Black or African American (United States of A~    22   24.5
## 10 55-64        White (United States of America)                   7   26.4
## 11 65+          Black or African American (United States of A~     5   23.4
```

```
current_median_commercial_age_5_race_group_salaried <- commercial_salaried %>% group_by(age_group_5, rac
current_median_commercial_age_5_race_group_salaried <- current_median_commercial_age_5_race_group_salari
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_race_group_salaried)
```

```
## # A tibble: 12 x 4
## # Groups:   age_group_5 [9]
##    age_group_5 race_grouping   count  median
##    <fct>       <chr>           <int>   <dbl>
##  1 <25         white               9  63000
##  2 25-29       person of color     7  72000
##  3 25-29       white              28  78692.
##  4 30-34       white              12  98848.
##  5 35-39       person of color     5  73522.
##  6 35-39       white              13 149101
##  7 40-44       white               6 126865.
##  8 45-49       person of color     6  85450.
##  9 45-49       white               7  90000
## 10 50-54       white               9  87392.
## 11 55-59       white               8  96957.
## 12 60-64       white               6  97651.
```

```
current_median_commercial_age_5_race_group_hourly <- commercial_hourly %>% group_by(age_group_5, race_g
current_median_commercial_age_5_race_group_hourly <- current_median_commercial_age_5_race_group_hourly %
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_race_group_hourly)
```

```
## # A tibble: 14 x 4
## # Groups:   age_group_5 [10]
##    age_group_5 race_grouping   count median
##    <fct>       <chr>           <int>  <dbl>
##  1 <25         person of color     7   25.6
##  2 25-29       person of color    10   26.3
##  3 25-29       white              11   31.8
##  4 30-34       person of color     8   28.8
##  5 35-39       person of color     6   30.8
##  6 35-39       white               6   30.8
```

```
##  7 40-44       person of color    14   28.5
##  8 45-49       person of color    14   23.1
##  9 50-54       person of color    13   23.2
## 10 50-54       white               5   24.4
## 11 55-59       person of color    11   27.0
## 12 55-59       white               5   25.4
## 13 60-64       person of color    11   24.3
## 14 65+         person of color     7   23.4
```

```
current_median_commercial_age_10_race_group_salaried <- commercial_salaried %>% group_by(age_group_10, r
current_median_commercial_age_10_race_group_salaried <- current_median_commercial_age_10_race_group_sala
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_race_group_salaried)
```

```
## # A tibble: 9 x 4
## # Groups:   age_group_10 [5]
##   age_group_10 race_grouping   count  median
##   <fct>        <chr>           <int>   <dbl>
## 1 <25          white               9  63000
## 2 25-34        person of color    10  74918.
## 3 25-34        white              40  82000
## 4 35-44        person of color     7  90431.
## 5 35-44        white              19 148730.
## 6 45-54        person of color     7  85000
## 7 45-54        white              16  88696.
## 8 55-64        person of color     6  82709.
## 9 55-64        white              14  97325.
```

```
current_median_commercial_age_10_race_group_hourly <- commercial_hourly %>% group_by(age_group_10, race_
current_median_commercial_age_10_race_group_hourly <- current_median_commercial_age_10_race_group_hourly
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_race_group_hourly)
```

```
## # A tibble: 10 x 4
## # Groups:   age_group_10 [6]
##    age_group_10 race_grouping   count median
##    <fct>        <chr>           <int>  <dbl>
##  1 <25          person of color     7   25.6
##  2 25-34        person of color    18   26.5
##  3 25-34        white              12   31.8
##  4 35-44        person of color    20   29.1
##  5 35-44        white               8   30.6
##  6 45-54        person of color    27   23.2
##  7 45-54        white               8   30.8
##  8 55-64        person of color    22   24.5
##  9 55-64        white               7   26.4
## 10 65+          person of color     7   23.4
```

```
current_median_commercial_age_5_race_gender_salaried <- commercial_salaried %>% group_by(age_group_5, ra
current_median_commercial_age_5_race_gender_salaried <- current_median_commercial_age_5_race_gender_sala
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
```

```
)
suppress(current_median_commercial_age_5_race_gender_salaried)
```

```
## # A tibble: 8 x 5
## # Groups:   age_group_5, race_ethnicity [7]
##   age_group_5 race_ethnicity                   gender count  median
##   <fct>       <chr>                            <chr>  <int>   <dbl>
## 1 <25         White (United States of America) Female     7  62000
## 2 25-29       White (United States of America) Female    25  76000
## 3 30-34       White (United States of America) Female     5 131097.
## 4 30-34       White (United States of America) Male       7  97696.
## 5 35-39       White (United States of America) Female     9 149101
## 6 40-44       White (United States of America) Female     6 126865.
## 7 50-54       White (United States of America) Female     6  98281.
## 8 55-59       White (United States of America) Male       5  97135.
```

```
current_median_commercial_age_5_race_gender_hourly <- commercial_hourly %>% group_by(age_group_5, race_e
current_median_commercial_age_5_race_gender_hourly <- current_median_commercial_age_5_race_gender_hourly
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_race_gender_hourly)
```

```
## # A tibble: 10 x 5
## # Groups:   age_group_5, race_ethnicity [8]
##    age_group_5 race_ethnicity                            gender count median
##    <fct>       <chr>                                     <chr>  <int>  <dbl>
##  1 <25         Black or African American (United State~ Male       5   22.4
##  2 25-29       White (United States of America)          Female     7   35.0
##  3 40-44       Black or African American (United State~ Female     9   29.7
##  4 45-49       Black or African American (United State~ Male      10   22.4
##  5 50-54       Black or African American (United State~ Female     6   23.3
##  6 50-54       Black or African American (United State~ Male       6   23.0
##  7 50-54       White (United States of America)          Male       5   24.4
##  8 55-59       Black or African American (United State~ Female     7   28.6
##  9 60-64       Black or African American (United State~ Female     5   24.3
## 10 60-64       Black or African American (United State~ Male       6   23.8
```

```
current_median_commercial_age_10_race_gender_salaried <- commercial_salaried %>% group_by(age_group_10,
current_median_commercial_age_10_race_gender_salaried <- current_median_commercial_age_10_race_gender_sa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_race_gender_salaried)
```

```
## # A tibble: 9 x 5
## # Groups:   age_group_10, race_ethnicity [6]
##   age_group_10 race_ethnicity                   gender count  median
##   <fct>        <chr>                            <chr>  <int>   <dbl>
## 1 <25          White (United States of America) Female     7  62000
## 2 25-34        Asian (United States of America) Female     5  90000
## 3 25-34        White (United States of America) Female    30  78692.
## 4 25-34        White (United States of America) Male      10  96348.
## 5 35-44        White (United States of America) Female    15 148730.
## 6 45-54        White (United States of America) Female    10  98281.
```

```
## 7 45-54       White (United States of America) Male       6  86196.
## 8 55-64       White (United States of America) Female     5  96780
## 9 55-64       White (United States of America) Male       9  97514.
```

```
current_median_commercial_age_10_race_gender_hourly <- commercial_hourly %>% group_by(age_group_10, race
current_median_commercial_age_10_race_gender_hourly <- current_median_commercial_age_10_race_gender_hou
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_race_gender_hourly)
```

```
## # A tibble: 11 x 5
## # Groups:   age_group_10, race_ethnicity [8]
##    age_group_10 race_ethnicity                           gender count median
##    <fct>        <chr>                                    <chr>  <int>  <dbl>
##  1 <25          Black or African American (United Stat~ Male       5   22.4
##  2 25-34        Black or African American (United Stat~ Female     6   26.5
##  3 25-34        Hispanic or Latino (United States of A~ Female     5   28.1
##  4 25-34        White (United States of America)        Female     8   33.4
##  5 35-44        Black or African American (United Stat~ Female    11   29.7
##  6 35-44        Black or African American (United Stat~ Male       6   24.8
##  7 45-54        Black or African American (United Stat~ Female    10   23.7
##  8 45-54        Black or African American (United Stat~ Male      16   22.4
##  9 45-54        White (United States of America)        Male       5   24.4
## 10 55-64        Black or African American (United Stat~ Female    12   25.0
## 11 55-64        Black or African American (United Stat~ Male      10   23.9
```

```
current_median_commercial_age_5_race_group_gender_salaried <- commercial_salaried %>% group_by(age_grou
current_median_commercial_age_5_race_group_gender_salaried <- current_median_commercial_age_5_race_grou
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_race_group_gender_salaried)
```

```
## # A tibble: 9 x 5
## # Groups:   age_group_5, race_grouping [8]
##   age_group_5 race_grouping   gender count  median
##   <fct>       <chr>           <chr>  <int>   <dbl>
## 1 <25         white           Female     7  62000
## 2 25-29       white           Female    25  76000
## 3 30-34       white           Female     5 131097.
## 4 30-34       white           Male       7  97696.
## 5 35-39       person of color Male       5  73522.
## 6 35-39       white           Female     9 149101
## 7 40-44       white           Female     6 126865.
## 8 50-54       white           Female     6  98281.
## 9 55-59       white           Male       5  97135.
```

```
current_median_commercial_age_5_race_group_gender_hourly <- commercial_hourly %>% group_by(age_group_5,
current_median_commercial_age_5_race_group_gender_hourly <- current_median_commercial_age_5_race_group_
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_5_race_group_gender_hourly)
```

```
## # A tibble: 12 x 5
```

```
## # Groups:   age_group_5, race_grouping [10]
##    age_group_5 race_grouping   gender count median
##    <fct>       <chr>           <chr>  <int>  <dbl>
##  1 <25         person of color Male       5   22.4
##  2 25-29       person of color Female     7   26.3
##  3 25-29       white           Female     7   35.0
##  4 30-34       person of color Female     5   30.4
##  5 40-44       person of color Female    10   29.5
##  6 45-49       person of color Male      10   22.4
##  7 50-54       person of color Female     6   23.3
##  8 50-54       person of color Male       7   21.1
##  9 50-54       white           Male       5   24.4
## 10 55-59       person of color Female     7   28.6
## 11 60-64       person of color Female     5   24.3
## 12 60-64       person of color Male       6   23.8
```

```
current_median_commercial_age_10_race_group_gender_salaried <- commercial_salaried %>% group_by(age_grou
current_median_commercial_age_10_race_group_gender_salaried <- current_median_commercial_age_10_race_gro
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_race_group_gender_salaried)
```

```
## # A tibble: 10 x 5
## # Groups:   age_group_10, race_grouping [7]
##    age_group_10 race_grouping   gender count  median
##    <fct>        <chr>           <chr>  <int>   <dbl>
##  1 <25          white           Female     7  62000
##  2 25-34        person of color Female     7  85000
##  3 25-34        white           Female    30  78692.
##  4 25-34        white           Male      10  96348.
##  5 35-44        person of color Male       6  81977.
##  6 35-44        white           Female    15 148730.
##  7 45-54        white           Female    10  98281.
##  8 45-54        white           Male       6  86196.
##  9 55-64        white           Female     5  96780
## 10 55-64        white           Male       9  97514.
```

```
current_median_commercial_age_10_race_group_gender_hourly <- commercial_hourly %>% group_by(age_group_10
current_median_commercial_age_10_race_group_gender_hourly <- current_median_commercial_age_10_race_group
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress(current_median_commercial_age_10_race_group_gender_hourly)
```

```
## # A tibble: 11 x 5
## # Groups:   age_group_10, race_grouping [7]
##    age_group_10 race_grouping   gender count median
##    <fct>        <chr>           <chr>  <int>  <dbl>
##  1 <25          person of color Male       5   22.4
##  2 25-34        person of color Female    12   27.4
##  3 25-34        person of color Male       6   26.2
##  4 25-34        white           Female     8   33.4
##  5 35-44        person of color Female    13   29.7
##  6 35-44        person of color Male       7   23.1
```

```
##   7 45-54       person of color Female    10   23.7
##   8 45-54       person of color Male      17   22.3
##   9 45-54       white           Male       5   24.4
##  10 55-64       person of color Female    12   25.0
##  11 55-64       person of color Male      10   23.9
```

Departments

```
current_commercial_median_department_salaried <- commercial_salaried %>% group_by(department)
current_commercial_median_department_salaried <- current_commercial_median_department_salaried %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_salaried)
```

```
## # A tibble: 5 x 3
##   department             count median
##   <chr>                  <int>  <dbl>
## 1 Finance                    8 90576.
## 2 WP News Media Services     9 86105.
## 3 Client Solutions         102 85634.
## 4 Marketing                  7 81196.
## 5 Production                 5 71665.
```

```
current_commercial_median_department_hourly <- commercial_hourly %>% group_by(department)
current_commercial_median_department_hourly <- current_commercial_median_department_hourly %>% summarise
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_hourly)
```

```
## # A tibble: 4 x 3
##   department       count median
##   <chr>            <int>  <dbl>
## 1 Public Relations     5   35.0
## 2 Client Solutions    62   29.4
## 3 Finance             23   29.2
## 4 Circulation         49   22.4
```

```
current_commercial_median_department_gender_salaried <- commercial_salaried %>% group_by(department, gen
current_commercial_median_department_gender_salaried <- current_commercial_median_department_gender_sala
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_gender_salaried)
```

```
## # A tibble: 4 x 4
## # Groups:   department [3]
##   department             gender count median
##   <chr>                  <chr>  <int>  <dbl>
## 1 Finance                Female     5 96780
## 2 Client Solutions       Male      31 90000
## 3 WP News Media Services Male       5 85900.
## 4 Client Solutions       Female    71 85000
```

```r
current_commercial_median_department_gender_hourly <- commercial_hourly %>% group_by(department, gender
current_commercial_median_department_gender_hourly <- current_commercial_median_department_gender_hourl
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_gender_hourly)
```

```
## # A tibble: 7 x 4
## # Groups:   department [4]
##   department       gender count median
##   <chr>            <chr>  <int>  <dbl>
## 1 Public Relations Female     5   35.0
## 2 Client Solutions Male      24   30.1
## 3 Finance          Female    17   29.2
## 4 Finance          Male       6   28.8
## 5 Client Solutions Female    38   28.8
## 6 Circulation      Female     9   23.2
## 7 Circulation      Male      40   22.4
```

```r
current_commercial_median_department_race_salaried <- commercial_salaried %>% group_by(department, race_
current_commercial_median_department_race_salaried <- current_commercial_median_department_race_salarie
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_salaried)
```

```
## # A tibble: 5 x 4
## # Groups:   department [3]
##   department          race_ethnicity                        count median
##   <chr>               <chr>                                 <int>  <dbl>
## 1 Client Solutions    White (United States of America)         79 90000
## 2 WP News Media Serv~ White (United States of America)          8 88302.
## 3 Client Solutions    Black or African American (United State~    10 83805.
## 4 Marketing           White (United States of America)          5 83280
## 5 Client Solutions    Asian (United States of America)          9 76139.
```

```r
current_commercial_median_department_race_hourly <- commercial_hourly %>% group_by(department, race_eth
current_commercial_median_department_race_hourly <- current_commercial_median_department_race_hourly %>
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_hourly)
```

```
## # A tibble: 8 x 4
## # Groups:   department [3]
##   department      race_ethnicity                               count median
##   <chr>           <chr>                                        <int>  <dbl>
## 1 Client Solutio~ White (United States of America)                24   31.0
## 2 Finance         White (United States of America)                 5   29.5
## 3 Finance         Black or African American (United States of~    16   29.1
## 4 Client Solutio~ Hispanic or Latino (United States of Americ~     6   28.5
## 5 Client Solutio~ Black or African American (United States of~    25   27.0
## 6 Client Solutio~ Asian (United States of America)                 5   26.3
## 7 Circulation     White (United States of America)                 8   22.8
## 8 Circulation     Black or African American (United States of~    35   22.4
```

```
current_commercial_median_department_race_gender_salaried <- commercial_salaried %>% group_by(departmen
current_commercial_median_department_race_gender_salaried <- current_commercial_median_department_race_g
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_gender_salaried)
```

```
## # A tibble: 4 x 5
## # Groups:   department, race_ethnicity [3]
##   department      race_ethnicity                            gender count median
##   <chr>           <chr>                                     <chr>  <int>  <dbl>
## 1 Client Soluti~ White (United States of America)          Male      22 98894.
## 2 Client Soluti~ Black or African American (United Sta~ Female     6 92158
## 3 Client Soluti~ White (United States of America)          Female    57 86613
## 4 Client Soluti~ Asian (United States of America)          Female     5 80000
```

```
current_commercial_median_department_race_gender_hourly <- commercial_hourly %>% group_by(department, ra
current_commercial_median_department_race_gender_hourly <- current_commercial_median_department_race_gen
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_gender_hourly)
```

```
## # A tibble: 9 x 5
## # Groups:   department, race_ethnicity [6]
##   department      race_ethnicity                            gender count median
##   <chr>           <chr>                                     <chr>  <int>  <dbl>
## 1 Client Soluti~ White (United States of America)          Female    13   31.7
## 2 Client Soluti~ White (United States of America)          Male      11   30.8
## 3 Finance         Black or African American (United Sta~ Female    12   29.1
## 4 Client Soluti~ Hispanic or Latino (United States of ~ Female     6   28.5
## 5 Client Soluti~ Black or African American (United Sta~ Male       9   28.2
## 6 Client Soluti~ Black or African American (United Sta~ Female    16   26.0
## 7 Circulation     Black or African American (United Sta~ Female     9   23.2
## 8 Circulation     White (United States of America)          Male       8   22.8
## 9 Circulation     Black or African American (United Sta~ Male      26   22.4
```

```
current_commercial_median_department_race_group_gender_salaried <- commercial_salaried %>% group_by(depa
current_commercial_median_department_race_group_gender_salaried <- current_commercial_median_department_
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_group_gender_salaried)
```

```
## # A tibble: 4 x 5
## # Groups:   department, race_grouping [2]
##   department       race_grouping   gender count median
##   <chr>            <chr>           <chr>  <int>  <dbl>
## 1 Client Solutions white           Male      22 98894.
## 2 Client Solutions white           Female    57 86613
## 3 Client Solutions person of color Female    13 80000
## 4 Client Solutions person of color Male       9 76139.
```

```
current_commercial_median_department_race_group_gender_hourly <- commercial_hourly %>% group_by(departme
current_commercial_median_department_race_group_gender_hourly <- current_commercial_median_department_ra
```

```
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_group_gender_hourly)
```

```
## # A tibble: 8 x 5
## # Groups:   department, race_grouping [5]
##   department       race_grouping   gender count median
##   <chr>            <chr>           <chr>  <int>  <dbl>
## 1 Client Solutions white           Female    13   31.7
## 2 Client Solutions white           Male      11   30.8
## 3 Finance          person of color Female    13   28.9
## 4 Client Solutions person of color Male      13   27.0
## 5 Client Solutions person of color Female    25   26.3
## 6 Circulation      person of color Female     9   23.2
## 7 Circulation      white           Male       8   22.8
## 8 Circulation      person of color Male      30   22.4
```

```
current_commercial_median_department_race_gender_age5_salaried <- commercial_salaried %>% group_by(depa
current_commercial_median_department_race_gender_age5_salaried <- current_commercial_median_department_
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_gender_age5_salaried)
```

```
## # A tibble: 6 x 6
## # Groups:   department, race_ethnicity, gender [2]
##   department     race_ethnicity             gender age_group_5 count median
##   <chr>          <chr>                      <chr>  <fct>       <int>  <dbl>
## 1 Client Soluti~ White (United States of A~ Female 35-39           9 1.49e5
## 2 Client Soluti~ White (United States of A~ Female 40-44           6 1.27e5
## 3 Client Soluti~ White (United States of A~ Female 50-54           5 1.06e5
## 4 Client Soluti~ White (United States of A~ Male   30-34           5 1.00e5
## 5 Client Soluti~ White (United States of A~ Female 25-29          23 7.50e4
## 6 Client Soluti~ White (United States of A~ Female <25             6 6.10e4
```

```
current_commercial_median_department_race_gender_age5_hourly <- commercial_hourly %>% group_by(departme
current_commercial_median_department_race_gender_age5_hourly <- current_commercial_median_department_ra
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_gender_age5_hourly)
```

```
## # A tibble: 3 x 6
## # Groups:   department, race_ethnicity, gender [2]
##   department    race_ethnicity              gender age_group_5 count median
##   <chr>         <chr>                       <chr>  <fct>       <int>  <dbl>
## 1 Client Solut~ White (United States of Am~ Female 25-29           5   31.8
## 2 Circulation   Black or African American ~ Male   60-64           6   23.8
## 3 Circulation   Black or African American ~ Male   45-49           7   21.5
```

```
current_commercial_median_department_race_group_gender_age5_salaried <- commercial_salaried %>% group_b
current_commercial_median_department_race_group_gender_age5_salaried <- current_commercial_median_depar
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
```

```
)
suppress_median(current_commercial_median_department_race_group_gender_age5_salaried)
```

```
## # A tibble: 6 x 6
## # Groups:   department, race_grouping, gender [2]
##   department       race_grouping gender age_group_5 count  median
##   <chr>            <chr>         <chr>  <fct>       <int>   <dbl>
## 1 Client Solutions white         Female 35-39           9 149101
## 2 Client Solutions white         Female 40-44           6 126865.
## 3 Client Solutions white         Female 50-54           5 105893
## 4 Client Solutions white         Male   30-34           5 100000
## 5 Client Solutions white         Female 25-29          23  75000
## 6 Client Solutions white         Female <25             6  61000
```

```
current_commercial_median_department_race_group_gender_age5_hourly <- commercial_hourly %>% group_by(dep
current_commercial_median_department_race_group_gender_age5_hourly <- current_commercial_median_departme
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_department_race_group_gender_age5_hourly)
```

```
## # A tibble: 5 x 6
## # Groups:   department, race_grouping, gender [3]
##   department       race_grouping   gender age_group_5 count median
##   <chr>            <chr>           <chr>  <fct>       <int>  <dbl>
## 1 Client Solutions white           Female 25-29           5   31.8
## 2 Client Solutions person of color Female 40-44           5   25.0
## 3 Circulation      person of color Male   60-64           6   23.8
## 4 Circulation      person of color Male   45-49           7   21.5
## 5 Circulation      person of color Male   50-54           5   20.8
```

Job profiles

```
current_commercial_median_job_salaried <- commercial_salaried %>% group_by(job_profile_current)
current_commercial_median_job_salaried <- current_commercial_median_job_salaried %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_salaried)
```

```
## # A tibble: 10 x 3
##    job_profile_current                  count  median
##    <chr>                                <int>   <dbl>
##  1 450220 - Sales Representative           25 153987.
##  2 350227 - Custom Content Writer           7 100000
##  3 551104 - Senior Financial Accountant     5  90566
##  4 450120 - Account Manager                26  88645.
##  5 390110 - Multiplatform Editor            9  86105.
##  6 280228 - Designer                        7  85000
##  7 340227 - Artist                          5  75035.
##  8 481205 - Digital Analyst                 5  75000
##  9 660127 - Make-Up Person                  5  71665.
## 10 231303 - Client Service Manager         15  67096.
```

```r
current_commercial_median_job_hourly <- commercial_hourly %>% group_by(job_profile_current)
current_commercial_median_job_hourly <- current_commercial_median_job_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_hourly)
```

```
## # A tibble: 5 x 3
##   job_profile_current                   count median
##   <chr>                                 <int>  <dbl>
## 1 341027 - Desktop Publisher                6   30.8
## 2 574504 - Senior Accounting Specialist    11   30.4
## 3 565005 - Accounting Specialist           12   26.6
## 4 470121 - Account Executive               16   25.2
## 5 600318 - Circulation Driver (Class A)    35   22.4
```

```r
current_commercial_median_job_gender_salaried <- commercial_salaried %>% group_by(job_profile_current, g
current_commercial_median_job_gender_salaried <- current_commercial_median_job_gender_salaried %>% summa
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_gender_salaried)
```

```
## # A tibble: 6 x 4
## # Groups:   job_profile_current [4]
##   job_profile_current             gender count  median
##   <chr>                           <chr>  <int>   <dbl>
## 1 450220 - Sales Representative   Male       6 162339.
## 2 450220 - Sales Representative   Female    19 150780
## 3 450120 - Account Manager        Female    17  90110
## 4 390110 - Multiplatform Editor   Male       5  85900.
## 5 450120 - Account Manager        Male       9  85418.
## 6 231303 - Client Service Manager Female    13  68000
```

```r
current_commercial_median_job_gender_hourly <- commercial_hourly %>% group_by(job_profile_current, gende
current_commercial_median_job_gender_hourly <- current_commercial_median_job_gender_hourly %>% summarise
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_gender_hourly)
```

```
## # A tibble: 5 x 4
## # Groups:   job_profile_current [4]
##   job_profile_current                   gender count median
##   <chr>                                 <chr>  <int>  <dbl>
## 1 574504 - Senior Accounting Specialist Female    10   30.1
## 2 565005 - Accounting Specialist        Male       5   27.2
## 3 565005 - Accounting Specialist        Female     7   26.0
## 4 470121 - Account Executive            Female    15   25.0
## 5 600318 - Circulation Driver (Class A) Male      34   22.5
```

```r
current_commercial_median_job_race_salaried <- commercial_salaried %>% group_by(job_profile_current, rac
current_commercial_median_job_race_salaried <- current_commercial_median_job_race_salaried %>% summarise
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
```

```r
)
suppress_median(current_commercial_median_job_race_salaried)
```

```
## # A tibble: 6 x 4
## # Groups:   job_profile_current [5]
##   job_profile_current       race_ethnicity                     count median
##   <chr>                     <chr>                              <int>  <dbl>
## 1 450220 - Sales Represent~ White (United States of America)      23 1.51e5
## 2 350227 - Custom Content ~ White (United States of America)       6 1.00e5
## 3 450120 - Account Manager  White (United States of America)      15 9.07e4
## 4 390110 - Multiplatform E~ White (United States of America)       8 8.83e4
## 5 450120 - Account Manager  Black or African American (United~     7 8.54e4
## 6 231303 - Client Service ~ White (United States of America)      14 6.55e4
```

```r
current_commercial_median_job_race_hourly <- commercial_hourly %>% group_by(job_profile_current, race_e
current_commercial_median_job_race_hourly <- current_commercial_median_job_race_hourly %>% summarise(
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_hourly)
```

```
## # A tibble: 6 x 4
## # Groups:   job_profile_current [4]
##   job_profile_current         race_ethnicity                   count median
##   <chr>                       <chr>                            <int>  <dbl>
## 1 574504 - Senior Accounting~ Black or African American (Unit~     8   30.1
## 2 565005 - Accounting Specia~ Black or African American (Unit~     7   26.0
## 3 470121 - Account Executive  White (United States of America)     5   25.4
## 4 470121 - Account Executive  Black or African American (Unit~     9   24.7
## 5 600318 - Circulation Drive~ White (United States of America)     7   23.0
## 6 600318 - Circulation Drive~ Black or African American (Unit~    23   22.4
```

```r
current_commercial_median_job_race_gender_salaried <- commercial_salaried %>% group_by(job_profile_curr
current_commercial_median_job_race_gender_salaried <- current_commercial_median_job_race_gender_salarie
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_gender_salaried)
```

```
## # A tibble: 4 x 5
## # Groups:   job_profile_current, race_ethnicity [3]
##   job_profile_current        race_ethnicity              gender count median
##   <chr>                      <chr>                       <chr>  <int>  <dbl>
## 1 450220 - Sales Representa~ White (United States of A~ Male       5 1.55e5
## 2 450220 - Sales Representa~ White (United States of A~ Female    18 1.50e5
## 3 450120 - Account Manager   White (United States of A~ Female    11 9.01e4
## 4 231303 - Client Service M~ White (United States of A~ Female    12 6.60e4
```

```r
current_commercial_median_job_race_gender_hourly <- commercial_hourly %>% group_by(job_profile_current,
current_commercial_median_job_race_gender_hourly <- current_commercial_median_job_race_gender_hourly %>
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_gender_hourly)
```

```
## # A tibble: 5 x 5
```

```
## # Groups:   job_profile_current, race_ethnicity [5]
##   job_profile_current      race_ethnicity              gender count median
##   <chr>                    <chr>                       <chr>  <int>  <dbl>
## 1 574504 - Senior Account~ Black or African American (~ Female     7   29.7
## 2 565005 - Accounting Spe~ Black or African American (~ Female     5   26.0
## 3 470121 - Account Execut~ Black or African American (~ Female     9   24.7
## 4 600318 - Circulation Dr~ White (United States of Ame~ Male       7   23.0
## 5 600318 - Circulation Dr~ Black or African American (~ Male      22   22.4
```

```
current_commercial_median_job_race_group_gender_salaried <- commercial_salaried %>% group_by(job_profil
current_commercial_median_job_race_group_gender_salaried <- current_commercial_median_job_race_group_ge
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_group_gender_salaried)
```

```
## # A tibble: 6 x 5
## # Groups:   job_profile_current, race_grouping [4]
##   job_profile_current             race_grouping   gender count  median
##   <chr>                           <chr>           <chr>  <int>   <dbl>
## 1 450220 - Sales Representative   white           Male       5 155300
## 2 450220 - Sales Representative   white           Female    18 149940.
## 3 450120 - Account Manager        person of color Female     5  99316
## 4 450120 - Account Manager        white           Female    11  90110
## 5 450120 - Account Manager        person of color Male       5  82609.
## 6 231303 - Client Service Manager white           Female    12  66001.
```

```
current_commercial_median_job_race_group_gender_hourly <- commercial_hourly %>% group_by(job_profile_cu
current_commercial_median_job_race_group_gender_hourly <- current_commercial_median_job_race_group_gend
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_group_gender_hourly)
```

```
## # A tibble: 5 x 5
## # Groups:   job_profile_current, race_grouping [5]
##   job_profile_current                   race_grouping   gender count median
##   <chr>                                 <chr>           <chr>  <int>  <dbl>
## 1 574504 - Senior Accounting Specialist person of color Female     7   29.7
## 2 565005 - Accounting Specialist        person of color Female     6   25.8
## 3 470121 - Account Executive            person of color Female    11   24.7
## 4 600318 - Circulation Driver (Class A) white           Male       7   23.0
## 5 600318 - Circulation Driver (Class A) person of color Male      26   22.4
```

```
current_commercial_median_job_race_gender_age5_salaried <- commercial_salaried %>% group_by(job_profile_
current_commercial_median_job_race_gender_age5_salaried <- current_commercial_median_job_race_gender_ag
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_gender_age5_salaried)
```

```
## # A tibble: 2 x 6
## # Groups:   job_profile_current, race_ethnicity, gender [2]
##   job_profile_current   race_ethnicity      gender age_group_5 count median
##   <chr>                 <chr>               <chr>  <fct>       <int>  <dbl>
## 1 450220 - Sales Repre~ White (United Stat~ Female 35-39           8 1.50e5
```

```
## 2 231303 - Client Serv~ White (United Stat~ Female 25-29          8 6.62e4
```

```
current_commercial_median_job_race_gender_age5_hourly <- commercial_hourly %>% group_by(job_profile_cur
current_commercial_median_job_race_gender_age5_hourly <- current_commercial_median_job_race_gender_age5
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_gender_age5_hourly)
```

```
## # A tibble: 2 x 6
## # Groups:   job_profile_current, race_ethnicity, gender [1]
##   job_profile_current  race_ethnicity       gender age_group_5 count median
##   <chr>                <chr>                <chr>  <fct>       <int>  <dbl>
## 1 600318 - Circulatio~ Black or African Am~ Male   60-64           6   23.8
## 2 600318 - Circulatio~ Black or African Am~ Male   45-49           7   21.5
```

```
current_commercial_median_job_race_group_gender_age5_salaried <- commercial_salaried %>% group_by(job_p
current_commercial_median_job_race_group_gender_age5_salaried <- current_commercial_median_job_race_grou
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_group_gender_age5_salaried)
```

```
## # A tibble: 2 x 6
## # Groups:   job_profile_current, race_grouping, gender [2]
##   job_profile_current         race_grouping gender age_group_5 count median
##   <chr>                       <chr>         <chr>  <fct>       <int>  <dbl>
## 1 450220 - Sales Representat~ white         Female 35-39           8 1.50e5
## 2 231303 - Client Service Ma~ white         Female 25-29           8 6.62e4
```

```
current_commercial_median_job_race_group_gender_age5_hourly <- commercial_hourly %>% group_by(job_profil
current_commercial_median_job_race_group_gender_age5_hourly <- current_commercial_median_job_race_group
  count = length(current_base_pay),
  median = median(current_base_pay, na.rm = FALSE)
)
suppress_median(current_commercial_median_job_race_group_gender_age5_hourly)
```

```
## # A tibble: 2 x 6
## # Groups:   job_profile_current, race_grouping, gender [1]
##   job_profile_current         race_grouping gender age_group_5 count median
##   <chr>                       <chr>         <chr>  <fct>       <int>  <dbl>
## 1 600318 - Circulation Drive~ person of co~ Male   60-64           6   23.8
## 2 600318 - Circulation Drive~ person of co~ Male   45-49           7   21.5
```

Performance evaluations

```
commercial_ratings <- filter(ratings_combined, dept == 'Commercial')

commercial_ratings_gender <- commercial_ratings %>% group_by(gender)
commercial_ratings_gender <- commercial_ratings_gender %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress_median(commercial_ratings_gender)
```

```
## # A tibble: 2 x 3
```

```
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female  1308    3.3
## 2 Male     984    3.2
```

```
commercial_ratings_race <- commercial_ratings %>% group_by(race_ethnicity)
commercial_ratings_race <- commercial_ratings_race %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress_median(commercial_ratings_race)
```

```
## # A tibble: 6 x 3
##   race_ethnicity                                          count median
##   <chr>                                                   <int>  <dbl>
## 1 Asian (United States of America)                          168   3.3
## 2 Two or More Races (United States of America)               36   3.3
## 3 White (United States of America)                         1096   3.3
## 4 Black or African American (United States of America)      860   3.2
## 5 Hispanic or Latino (United States of America)              96   3.15
## 6 Prefer Not to Disclose (United States of America)          28   3
```

```
commercial_ratings_race_gender <- commercial_ratings %>% group_by(race_ethnicity, gender)
commercial_ratings_race_gender <- commercial_ratings_race_gender %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(commercial_ratings_race_gender)
```

```
## # A tibble: 12 x 4
## # Groups:   race_ethnicity [6]
##    race_ethnicity                                         gender count median
##    <chr>                                                  <chr>  <int>  <dbl>
##  1 Asian (United States of America)                       Female   116   3.3
##  2 Asian (United States of America)                       Male      52   3.1
##  3 Black or African American (United States of America)  Female   408   3.2
##  4 Black or African American (United States of America)  Male     452   3.05
##  5 Hispanic or Latino (United States of America)          Female    56   3.15
##  6 Hispanic or Latino (United States of America)          Male      40   3.1
##  7 Prefer Not to Disclose (United States of America)      Female    16   3
##  8 Prefer Not to Disclose (United States of America)      Male      12  NA
##  9 Two or More Races (United States of America)           Female    20   3.3
## 10 Two or More Races (United States of America)           Male      16   3.35
## 11 White (United States of America)                       Female   684   3.3
## 12 White (United States of America)                       Male     412   3.3
```

```
commercial_ratings_race_gender_under3 <- filter(commercial_ratings, performance_rating < 3.1) %>% group_
commercial_ratings_race_gender_under3 <- commercial_ratings_race_gender_under3 %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(commercial_ratings_race_gender_under3)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
```

```
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female    81    3
## 2 person of color Male     115    3
## 3 white           Female    80    3
## 4 white           Male      56    2.9
```

```r
commercial_ratings_race_gender_over4 <- filter(commercial_ratings, performance_rating > 3.9) %>% group_
commercial_ratings_race_gender_over4 <- commercial_ratings_race_gender_over4 %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(commercial_ratings_race_gender_over4)
```

```
## # A tibble: 3 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female     6   4.15
## 2 white           Female    17   4.2
## 3 white           Male      12   4
```

Pay changes

```r
commercial_change <- filter(reason_for_change_combined, dept == 'Commercial')

commercial_change_gender <- commercial_change %>% group_by(business_process_reason, gender)
commercial_change_gender %>% summarise(
  count = length(business_process_reason)
)
```

```
## # A tibble: 34 x 3
## # Groups:   business_process_reason [18]
##    business_process_reason                        gender count
##    <chr>                                          <chr>  <int>
##  1 Data Change > Data Change > Change Job Details Female    85
##  2 Data Change > Data Change > Change Job Details Male      61
##  3 Hire Employee > New Hire > Conversion          Female     6
##  4 Hire Employee > New Hire > Conversion          Male       3
##  5 Hire Employee > New Hire > Convert Contingent  Female     4
##  6 Hire Employee > New Hire > Convert Contingent  Male       3
##  7 Hire Employee > New Hire > Fill Vacancy        Female    70
##  8 Hire Employee > New Hire > Fill Vacancy        Male      58
##  9 Hire Employee > New Hire > New Position        Female    31
## 10 Hire Employee > New Hire > New Position        Male      22
## # ... with 24 more rows
```

```r
commercial_change_race <- commercial_change %>% group_by(business_process_reason, race_ethnicity)
commercial_change_race <- commercial_change_race %>% summarise(
  count = length(business_process_reason)
)
suppress_count(commercial_change_race)
```

```
## # A tibble: 51 x 3
## # Groups:   business_process_reason [17]
##    business_process_reason              race_ethnicity                 count
##    <chr>                                <chr>                          <int>
```

```
##  1 <NA>                                White (United States of Amer~  2995
##  2 <NA>                                Black or African American (U~  2340
##  3 <NA>                                Asian (United States of Amer~   448
##  4 Request Compensation Change > Adjus~ White (United States of Amer~   392
##  5 Request Compensation Change > Adjus~ Black or African American (U~   339
##  6 <NA>                                Hispanic or Latino (United S~   272
##  7 Merit > Performance > Annual Perfor~ Black or African American (U~   239
##  8 Merit > Performance > Annual Perfor~ White (United States of Amer~   220
##  9 Request Compensation Change > Adjus~ White (United States of Amer~   179
## 10 Transfer > Transfer > Move to anoth~ Black or African American (U~   116
## # ... with 41 more rows
```

```
commercial_change_race_gender <- commercial_change %>% group_by(business_process_reason, race_ethnicity
commercial_change_race_gender <- commercial_change_race_gender %>% summarise(
  count = length(business_process_reason)
)
suppress_count(commercial_change_race_gender)
```

```
## # A tibble: 77 x 4
## # Groups:   business_process_reason, race_ethnicity [45]
##    business_process_reason          race_ethnicity             gender count
##    <chr>                            <chr>                      <chr>  <int>
##  1 <NA>                             White (United States of A~ Female  1839
##  2 <NA>                             Black or African American~ Male    1272
##  3 <NA>                             White (United States of A~ Male    1156
##  4 <NA>                             Black or African American~ Female  1068
##  5 <NA>                             Asian (United States of A~ Female   320
##  6 Request Compensation Change > A~ White (United States of A~ Female   236
##  7 Request Compensation Change > A~ Black or African American~ Female   179
##  8 <NA>                             Hispanic or Latino (Unite~ Female   164
##  9 Request Compensation Change > A~ Black or African American~ Male     160
## 10 Request Compensation Change > A~ White (United States of A~ Male     156
## # ... with 67 more rows
```

Performance evaluations x merit raises

```
reason_for_change_combined <- reason_for_change_combined %>% mutate(merit_raises = grepl('*Merit*', busi
twenty14 = as.Date('2016-04-01')
twenty15 = as.Date('2017-04-01')
twenty16 = as.Date('2018-04-01')
twenty17 = as.Date('2019-04-01')
twenty18 = as.Date('2020-04-01')

reason_for_change_combined <- reason_for_change_combined %>%
    mutate(raise_after=case_when(
    effective_date < twenty14 ~ 'before 2015',
    effective_date < twenty15 ~ '2015',
    effective_date < twenty16 ~ '2016',
    effective_date < twenty17 ~ '2017',
    effective_date < twenty18 ~ '2018',
    TRUE ~ 'Other'))

merit_raises_commercial_gender_salaried <- filter(reason_for_change_combined, merit_raises == TRUE, dep
merit_raises_commercial_gender_salaried <- merit_raises_commercial_gender_salaried %>% summarise(
```

```
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress(merit_raises_commercial_gender_salaried)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female    97  1317.
## 2 Male      74  1205.
```

```
merit_raises_commercial_gender_hourly <- filter(reason_for_change_combined, merit_raises == TRUE, dept =
merit_raises_commercial_gender_hourly <- merit_raises_commercial_gender_hourly %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress(merit_raises_commercial_gender_hourly)
```

```
## # A tibble: 2 x 3
##   gender count median
##   <chr>  <int>  <dbl>
## 1 Female   170  0.425
## 2 Male     138  0.33
```

```
merit_raises_commercial_race_salaried <- filter(reason_for_change_combined, merit_raises == TRUE, dept =
merit_raises_commercial_race_salaried <- merit_raises_commercial_race_salaried %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_commercial_race_salaried)
```

```
## # A tibble: 4 x 3
##   race_ethnicity                                       count median
##   <chr>                                                <int>  <dbl>
## 1 Asian (United States of America)                        23  1375
## 2 Hispanic or Latino (United States of America)            6  1322.
## 3 White (United States of America)                       110  1287.
## 4 Black or African American (United States of America)    30  1117.
```

```
merit_raises_commercial_race_hourly <- filter(reason_for_change_combined, merit_raises == TRUE, dept ==
merit_raises_commercial_race_hourly <- merit_raises_commercial_race_hourly %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_commercial_race_hourly)
```

```
## # A tibble: 4 x 3
##   race_ethnicity                                       count median
##   <chr>                                                <int>  <dbl>
## 1 Asian (United States of America)                        11   0.45
## 2 White (United States of America)                        85   0.42
## 3 Hispanic or Latino (United States of America)           11   0.37
## 4 Black or African American (United States of America)   197   0.35
```

```
merit_raises_commercial_race_group_salaried <- filter(reason_for_change_combined, merit_raises == TRUE,
merit_raises_commercial_race_group_salaried <- merit_raises_commercial_race_group_salaried %>% summaris
```

```r
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_commercial_race_group_salaried)
```

```
## # A tibble: 2 x 3
##   race_grouping   count median
##   <chr>           <int>  <dbl>
## 1 white             110  1287.
## 2 person of color    60  1225
```

```r
merit_raises_commercial_race_group_hourly <- filter(reason_for_change_combined, merit_raises == TRUE, de
merit_raises_commercial_race_group_hourly <- merit_raises_commercial_race_group_hourly %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_commercial_race_group_hourly)
```

```
## # A tibble: 2 x 3
##   race_grouping   count median
##   <chr>           <int>  <dbl>
## 1 white              85   0.42
## 2 person of color   223   0.35
```

```r
merit_raises_commercial_gender_race_group_salaried <- filter(reason_for_change_combined, merit_raises =
merit_raises_commercial_gender_race_group_salaried <- merit_raises_commercial_gender_race_group_salarie
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_commercial_gender_race_group_salaried)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 white           Female    69  1317.
## 2 person of color Female    27  1305
## 3 white           Male      41  1282.
## 4 person of color Male      33  1134.
```

```r
merit_raises_commercial_gender_race_group_hourly <- filter(reason_for_change_combined, merit_raises == T
merit_raises_commercial_gender_race_group_hourly <- merit_raises_commercial_gender_race_group_hourly %>%
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress_median(merit_raises_commercial_gender_race_group_hourly)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 white           Female    44  0.515
## 2 person of color Female   126  0.375
## 3 white           Male      41  0.35
## 4 person of color Male      97  0.32
```

```
fifteen_raises_amount <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Commercial',
fifteen_raises_amount <- fifteen_raises_amount %>% summarise(
  count = length(base_pay_change),
  median_raise = median(base_pay_change, na.rm = TRUE)
)
suppress(fifteen_raises_amount)
```

```
## # A tibble: 2 x 4
## # Groups:   race_grouping [1]
##   race_grouping gender count median_raise
##   <chr>         <chr>  <int>        <dbl>
## 1 white         Female     7         937.
## 2 white         Male       5         851.
```

```
fifteen_raises_score <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Commercial', p
fifteen_raises_score <- fifteen_raises_score %>% summarise(
  count = length('2015_annual_performance_rating'),
  median = median('2015_annual_performance_rating', na.rm = TRUE)
)
suppress(fifteen_raises_score)
```

```
## # A tibble: 0 x 4
## # Groups:   race_grouping [0]
## # ... with 4 variables: race_grouping <chr>, gender <chr>, count <int>,
## #   median <chr>
```

```
sixteen_raises_amount <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Commercial',
sixteen_raises_amount <- sixteen_raises_amount %>% summarise(
  count = length(base_pay_change),
  median_raise = median(base_pay_change, na.rm = TRUE)
)
suppress(sixteen_raises_amount)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median_raise
##   <chr>           <chr>  <int>        <dbl>
## 1 person of color Female     5        1729.
## 2 person of color Male       6        1507.
## 3 white           Female     9        1683
## 4 white           Male       7        1291.
```

```
sixteen_raises_score <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Commercial', p
sixteen_raises_score <- sixteen_raises_score %>% summarise(
  count = length('2016_annual_performance_rating'),
  median = median('2016_annual_performance_rating', na.rm = TRUE)
)
suppress(sixteen_raises_score)
```

```
## # A tibble: 0 x 4
## # Groups:   race_grouping [0]
## # ... with 4 variables: race_grouping <chr>, gender <chr>, count <int>,
## #   median <chr>
```

```
seventeen_raises_amount <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Commercial
seventeen_raises_amount <- seventeen_raises_amount %>% summarise(
```

```
  count = length(base_pay_change),
  median_raise = median(base_pay_change, na.rm = TRUE)
)
suppress(seventeen_raises_amount)
```

```
## # A tibble: 3 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median_raise
##   <chr>           <chr>  <int>        <dbl>
## 1 person of color Male       8        1000
## 2 white           Female    13        1398.
## 3 white           Male       5        1415.
```

```
seventeen_raises_score <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Commercial'
seventeen_raises_score <- seventeen_raises_score %>% summarise(
  count = length('2017_annual_performance_rating'),
  median = median('2017_annual_performance_rating', na.rm = TRUE)
)
suppress(seventeen_raises_score)
```

```
## # A tibble: 0 x 4
## # Groups:   race_grouping [0]
## # ... with 4 variables: race_grouping <chr>, gender <chr>, count <int>,
## #   median <chr>
```

```
eighteen_raises_amount <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Commercial'
eighteen_raises_amount <- eighteen_raises_amount %>% summarise(
  count = length(base_pay_change),
  median_raise = median(base_pay_change, na.rm = TRUE)
)
suppress(eighteen_raises_amount)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median_raise
##   <chr>           <chr>  <int>        <dbl>
## 1 person of color Female     7        1416.
## 2 person of color Male       7        1050
## 3 white           Female    21        1669.
## 4 white           Male       8        1417.
```

```
eighteen_raises_score <- filter(reason_for_change_combined, merit_raises == TRUE, dept == 'Commercial',
eighteen_raises_score <- eighteen_raises_score %>% summarise(
  count = length('2018_annual_performance_rating'),
  median = median('2018_annual_performance_rating', na.rm = TRUE)
)
suppress(eighteen_raises_score)
```

```
## # A tibble: 0 x 4
## # Groups:   race_grouping [0]
## # ... with 4 variables: race_grouping <chr>, gender <chr>, count <int>,
## #   median <chr>
```

```
merit_raises_15 <- filter(reason_for_change_combined, raise_after == '2015', merit_raises == TRUE)
merit_raises_16 <- filter(reason_for_change_combined, raise_after == '2016', merit_raises == TRUE)
merit_raises_17 <- filter(reason_for_change_combined, raise_after == '2017', merit_raises == TRUE)
```

```r
merit_raises_18 <- filter(reason_for_change_combined, raise_after == '2018', merit_raises == TRUE)

merit_raises_15 <- merit_raises_15[,c('base_pay_change','pay_rate_type','gender','race_ethnicity','race
merit_raises_16 <- merit_raises_16[,c('base_pay_change','pay_rate_type','gender','race_ethnicity','race
merit_raises_17 <- merit_raises_17[,c('base_pay_change','pay_rate_type','gender','race_ethnicity','race
merit_raises_18 <- merit_raises_18[,c('base_pay_change','pay_rate_type','gender','race_ethnicity','race

names(merit_raises_15) <- c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping'
names(merit_raises_16) <- c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping'
names(merit_raises_17) <- c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping'
names(merit_raises_18) <- c('base_pay_change','pay_rate_type','gender','race_ethnicity','race_grouping'

merit_raises_combined <- rbind(merit_raises_15, merit_raises_16, merit_raises_17, merit_raises_18)

commercial_salaried_raises <- filter(merit_raises_combined, pay_rate_type == 'Salaried', dept == 'Comme
commercial_salaried_raises <- commercial_salaried_raises %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress(commercial_salaried_raises)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female    20  1360.
## 2 person of color Male      24  1096.
## 3 white           Female    50  1344.
## 4 white           Male      25  1291.
```

```r
commercial_salaried_raises_scores <- filter(merit_raises_combined, pay_rate_type == 'Salaried', dept ==
commercial_salaried_raises_scores <- commercial_salaried_raises_scores %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(commercial_salaried_raises_scores)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female    20    3.5
## 2 person of color Male      24    3.3
## 3 white           Female    50    3.4
## 4 white           Male      25    3.4
```

```r
commercial_hourly_raises <- filter(merit_raises_combined, pay_rate_type == 'Hourly', dept == 'Commercia
commercial_hourly_raises <- commercial_hourly_raises %>% summarise(
  count = length(base_pay_change),
  median = median(base_pay_change, na.rm = TRUE)
)
suppress(commercial_hourly_raises)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
```

```
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female   102  0.37
## 2 person of color Male      89  0.28
## 3 white           Female    34  0.515
## 4 white           Male      37  0.35
```

```
commercial_hourly_raises_scores <- filter(merit_raises_combined, pay_rate_type == 'Hourly', dept == 'Co
commercial_hourly_raises_scores <- commercial_hourly_raises_scores %>% summarise(
  count = length(performance_rating),
  median = median(performance_rating, na.rm = TRUE)
)
suppress(commercial_hourly_raises_scores)
```

```
## # A tibble: 4 x 4
## # Groups:   race_grouping [2]
##   race_grouping   gender count median
##   <chr>           <chr>  <int>  <dbl>
## 1 person of color Female   102    3.3
## 2 person of color Male      89    3.2
## 3 white           Female    34    3.4
## 4 white           Male      37    3.2
```

Regression

```
commercial_salaried_regression <- commercial_salaried[,c('department','gender','race_ethnicity','curren
commercial_salaried_regression <- fastDummies::dummy_cols(commercial_salaried_regression, select_column
names(commercial_salaried_regression) <- gsub(' ', '_', names(commercial_salaried_regression))
names(commercial_salaried_regression) <- gsub('-', 'to', names(commercial_salaried_regression))
names(commercial_salaried_regression) <- gsub('\\+', '_over', names(commercial_salaried_regression))
names(commercial_salaried_regression) <- gsub('<', 'under_', names(commercial_salaried_regression))

linearMod41 <- lm(formula = current_base_pay ~ gender_Female + gender_Male, data=commercial_salaried_re
summary(linearMod41)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male,
##     data = commercial_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -42573 -22322  -9445   9259 115917
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)      94863       5051  18.780   <2e-16 ***
## gender_Female     1739       6282   0.277    0.782
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 34630 on 131 degrees of freedom
## Multiple R-squared:  0.0005845,  Adjusted R-squared:  -0.007045
## F-statistic: 0.07662 on 1 and 131 DF,  p-value: 0.7824
```

```r
linearMod42 <- lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color, data
summary(linearMod42)
```

```
##
## Call:
## lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color,
##     data = commercial_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -44088 -23088  -8978   9692 111692
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      78404      24283   3.229  0.00157 **
## race_grouping_white              20684      24527   0.843  0.40059
## race_grouping_person_of_color     9090      25030   0.363  0.71709
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 34340 on 130 degrees of freedom
## Multiple R-squared:  0.02468,    Adjusted R-squared:  0.009673
## F-statistic: 1.645 on 2 and 130 DF,  p-value: 0.1971
```

```r
linearMod43 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod43)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = commercial_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -44357 -23357  -8858   9423 112255
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    77571.2    25184.5   3.080  0.00253 **
## gender_Female                    832.3     6333.3   0.131  0.89565
## gender_Male                         NA         NA      NA       NA
## race_grouping_white            20953.5    24705.1   0.848  0.39793
## race_grouping_person_of_color   9479.6    25300.1   0.375  0.70851
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 34470 on 129 degrees of freedom
## Multiple R-squared:  0.02481,    Adjusted R-squared:  0.00213
## F-statistic: 1.094 on 3 and 129 DF,  p-value: 0.3542
```

```r
linearMod44 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + age_group_5_under_25 + age_
summary(linearMod44)
```

```
##
## Call:
```

```
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = commercial_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -69838 -19792  -4420  13357 101706
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)          111172.9    21450.2   5.183 8.77e-07 ***
## gender_Female          9550.2     5934.5   1.609   0.1101
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25 -54303.5    23972.3  -2.265   0.0253 *
## age_group_5_25to29   -41249.7    22596.0  -1.826   0.0704 .
## age_group_5_30to34    -2099.2    22994.9  -0.091   0.9274
## age_group_5_35to39     -814.7    22804.3  -0.036   0.9716
## age_group_5_40to44     5922.0    24293.7   0.244   0.8078
## age_group_5_45to49   -13931.3    23261.7  -0.599   0.5504
## age_group_5_50to54   -24879.8    23861.9  -1.043   0.2992
## age_group_5_55to59   -21494.8    23684.1  -0.908   0.3659
## age_group_5_60to64   -21443.9    23617.1  -0.908   0.3657
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 30340 on 122 degrees of freedom
## Multiple R-squared:  0.2858, Adjusted R-squared:  0.2272
## F-statistic: 4.882 on 10 and 122 DF,  p-value: 6.47e-06
```

```r
linearMod45 <- lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color + age
summary(linearMod45)
```

```
##
## Call:
## lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = commercial_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -62296 -18193  -3480  12866  90105
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    70232.3    30123.3   2.331   0.0214 *
## race_grouping_white            49331.5    21787.6   2.264   0.0253 *
## race_grouping_person_of_color  32549.8    22264.8   1.462   0.1464
## age_group_5_under_25          -53376.0    22895.2  -2.331   0.0214 *
## age_group_5_25to29            -38371.2    21443.9  -1.789   0.0761 .
## age_group_5_30to34              1111.7    22157.4   0.050   0.9601
```

```
## age_group_5_35to39              231.2    21945.2   0.011   0.9916
## age_group_5_40to44            15230.7    23150.7   0.658   0.5119
## age_group_5_45to49            -9434.3    22320.8  -0.423   0.6733
## age_group_5_50to54           -24907.3    22895.2  -1.088   0.2788
## age_group_5_55to59           -21754.2    22836.8  -0.953   0.3427
## age_group_5_60to64           -19302.0    22769.9  -0.848   0.3983
## age_group_5_65_over                NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 29380 on 121 degrees of freedom
## Multiple R-squared:  0.3353, Adjusted R-squared:  0.2749
## F-statistic: 5.549 on 11 and 121 DF,  p-value: 3.833e-07
```

```
linearMod46 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod46)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = commercial_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -63447 -17726  -2978  12784  95358
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      67196      29978   2.242   0.0268 *
## gender_Female                     9360       5747   1.629   0.1060
## gender_Male                         NA         NA      NA       NA
## race_grouping_white              51960      21700   2.394   0.0182 *
## race_grouping_person_of_color    35994      22215   1.620   0.1078
## age_group_5_under_25            -60538      23162  -2.614   0.0101 *
## age_group_5_25to29              -45882      21792  -2.105   0.0373 *
## age_group_5_30to34               -3734      22208  -0.168   0.8667
## age_group_5_35to39               -4268      21971  -0.194   0.8463
## age_group_5_40to44                7429      23488   0.316   0.7523
## age_group_5_45to49              -14443      22382  -0.645   0.5200
## age_group_5_50to54              -31133      23059  -1.350   0.1795
## age_group_5_55to59              -26190      22845  -1.146   0.2539
## age_group_5_60to64              -22964      22728  -1.010   0.3143
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 29190 on 120 degrees of freedom
## Multiple R-squared:  0.3497, Adjusted R-squared:  0.2847
## F-statistic: 5.377 on 12 and 120 DF,  p-value: 3.101e-07
```

```r
linearMod47 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod47)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over +
##     years_of_service_grouped_0 + years_of_service_grouped_1to2 +
##     years_of_service_grouped_3to5 + years_of_service_grouped_6to10 +
##     years_of_service_grouped_11to15 + years_of_service_grouped_16to20 +
##     years_of_service_grouped_21to25 + years_of_service_grouped_25_over,
##     data = commercial_salaried_regression)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -60538 -17883  -3429  16197  91640
##
## Coefficients: (3 not defined because of singularities)
##                                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       66064.9    31507.6   2.097   0.0382 *
## gender_Female                      9634.6     6095.5   1.581   0.1168
## gender_Male                            NA         NA      NA       NA
## race_grouping_white               53503.0    21924.2   2.440   0.0162 *
## race_grouping_person_of_color     39591.6    22445.3   1.764   0.0804 .
## age_group_5_under_25             -68107.0    26381.2  -2.582   0.0111 *
## age_group_5_25to29               -54633.3    25065.3  -2.180   0.0314 *
## age_group_5_30to34                -9711.9    25048.3  -0.388   0.6989
## age_group_5_35to39                -7693.3    24057.3  -0.320   0.7497
## age_group_5_40to44                 -228.9    26494.5  -0.009   0.9931
## age_group_5_45to49               -17846.6    25040.8  -0.713   0.4775
## age_group_5_50to54               -29093.0    25702.4  -1.132   0.2601
## age_group_5_55to59               -30069.1    23273.9  -1.292   0.1990
## age_group_5_60to64               -25234.2    26257.9  -0.961   0.3386
## age_group_5_65_over                    NA         NA      NA       NA
## years_of_service_grouped_0         5031.0    19054.1   0.264   0.7922
## years_of_service_grouped_1to2      9283.9    18949.1   0.490   0.6251
## years_of_service_grouped_3to5     10317.9    18590.9   0.555   0.5800
## years_of_service_grouped_6to10    -2878.6    18293.6  -0.157   0.8752
## years_of_service_grouped_11to15  -20650.9    21676.3  -0.953   0.3428
## years_of_service_grouped_16to20   -2368.4    22591.2  -0.105   0.9167
## years_of_service_grouped_21to25   -3082.4    22725.9  -0.136   0.8924
## years_of_service_grouped_25_over       NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 29230 on 113 degrees of freedom
## Multiple R-squared:  0.3858, Adjusted R-squared:  0.2825
## F-statistic: 3.735 on 19 and 113 DF,  p-value: 5.587e-06
```

```r
merit_raises_combined_salaried_regression <- filter(merit_raises_combined, dept == 'Commercial', pay_ra
```

```r
merit_raises_combined_salaried_regression <- fastDummies::dummy_cols(merit_raises_combined_salaried_reg
names(merit_raises_combined_salaried_regression) <- gsub(' ', '_', names(merit_raises_combined_salaried
names(merit_raises_combined_salaried_regression) <- gsub('-', 'to', names(merit_raises_combined_salarie
names(merit_raises_combined_salaried_regression) <- gsub('\\+', '_over', names(merit_raises_combined_sa
names(merit_raises_combined_salaried_regression) <- gsub('<', 'under_', names(merit_raises_combined_sal

linearMod48 <- lm(formula = base_pay_change ~ gender_Female + gender_Male, data=merit_raises_combined_s
summary(linearMod48)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male, data = merit_raises_combined_salaried_reg
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1442.2  -631.0  -253.3   258.0  4270.5
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)     1349.6      144.8   9.319 8.22e-16 ***
## gender_Female    307.3      188.3   1.632    0.105
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1014 on 118 degrees of freedom
## Multiple R-squared:  0.02208,    Adjusted R-squared:  0.01379
## F-statistic: 2.664 on 1 and 118 DF,  p-value: 0.1053
```

```r
linearMod49 <- lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color, data=
summary(linearMod49)
```

```
##
## Call:
## lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1374.7  -642.8  -256.7   329.2  4338.1
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    1400.00    1026.78   1.363    0.175
## race_grouping_white             189.38    1033.60   0.183    0.855
## race_grouping_person_of_color    35.73    1038.38   0.034    0.973
##
## Residual standard error: 1027 on 117 degrees of freedom
## Multiple R-squared:  0.005419,   Adjusted R-squared:  -0.01158
## F-statistic: 0.3188 on 2 and 117 DF,  p-value: 0.7277
```

```r
linearMod50 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod50)
```

```
##
```

```
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = merit_raises_combined_salaried_regres
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1472.1  -575.6  -252.3   303.5  4240.7
##
## Coefficients: (1 not defined because of singularities)
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      1107.7     1039.7   1.065    0.289
## gender_Female                     292.3      194.5   1.503    0.136
## gender_Male                          NA         NA      NA       NA
## race_grouping_white               286.8     1030.1   0.278    0.781
## race_grouping_person_of_color     195.2     1038.3   0.188    0.851
##
## Residual standard error: 1021 on 116 degrees of freedom
## Multiple R-squared:  0.02442,    Adjusted R-squared:  -0.0008146
## F-statistic: 0.9677 on 3 and 116 DF,  p-value: 0.4105
```

```
linearMod51 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + age_group_5_under_25 + age_g
summary(linearMod51)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1656.3  -536.9  -176.1   316.8  3731.3
##
## Coefficients: (3 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)           1094.63     292.17   3.746 0.000287 ***
## gender_Female          317.63     228.83   1.388 0.167912
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25   220.97    1045.13   0.211 0.832943
## age_group_5_25to29     425.73     384.14   1.108 0.270164
## age_group_5_30to34     -33.56     403.89  -0.083 0.933927
## age_group_5_35to39     649.61     378.35   1.717 0.088800 .
## age_group_5_40to44     883.45     496.12   1.781 0.077722 .
## age_group_5_45to49      63.78     362.88   0.176 0.860804
## age_group_5_50to54     -13.25     424.71  -0.031 0.975176
## age_group_5_55to59     306.92     536.75   0.572 0.568612
## age_group_5_60to64         NA         NA      NA       NA
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1003 on 110 degrees of freedom
## Multiple R-squared:  0.1069, Adjusted R-squared:  0.03384
```

```
## F-statistic: 1.463 on 9 and 110 DF,  p-value: 0.1706
```

```r
linearMod52 <- lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color + age_
summary(linearMod52)
```

```
##
## Call:
## lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1745.2  -580.7  -163.9   286.8  3988.9
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                      755.3     1075.9   0.702   0.4841
## race_grouping_white              412.0     1036.1   0.398   0.6917
## race_grouping_person_of_color    174.9     1048.7   0.167   0.8678
## age_group_5_under_25             148.3     1051.7   0.141   0.8881
## age_group_5_25to29               644.7      369.7   1.744   0.0840 .
## age_group_5_30to34               237.5      380.1   0.625   0.5335
## age_group_5_35to39               786.4      398.8   1.972   0.0511 .
## age_group_5_40to44              1217.3      465.2   2.617   0.0101 *
## age_group_5_45to49               288.2      372.2   0.774   0.4404
## age_group_5_50to54               213.1      405.6   0.525   0.6004
## age_group_5_55to59               630.9      507.9   1.242   0.2168
## age_group_5_60to64                  NA         NA      NA       NA
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1010 on 109 degrees of freedom
## Multiple R-squared:  0.1029, Adjusted R-squared:  0.02056
## F-statistic:  1.25 on 10 and 109 DF,  p-value: 0.2681
```

```r
linearMod53 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod53)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1726.0  -516.9  -190.1   298.9  3825.7
##
```

```
## Coefficients: (3 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    628.95    1078.72   0.583   0.5611
## gender_Female                  283.57     235.15   1.206   0.2305
## gender_Male                        NA         NA      NA       NA
## race_grouping_white            486.84    1035.84   0.470   0.6393
## race_grouping_person_of_color  300.96    1051.74   0.286   0.7753
## age_group_5_under_25           199.80    1050.42   0.190   0.8495
## age_group_5_25to29             487.48     391.31   1.246   0.2155
## age_group_5_30to34              35.62     414.64   0.086   0.9317
## age_group_5_35to39             754.73     398.79   1.893   0.0611 .
## age_group_5_40to44             966.05     508.81   1.899   0.0603 .
## age_group_5_45to49             168.08     384.54   0.437   0.6629
## age_group_5_50to54              34.69     430.98   0.080   0.9360
## age_group_5_55to59             381.78     547.29   0.698   0.4869
## age_group_5_60to64                 NA         NA      NA       NA
## age_group_5_65_over                NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1008 on 108 degrees of freedom
## Multiple R-squared:  0.1148, Adjusted R-squared:  0.02463
## F-statistic: 1.273 on 11 and 108 DF,  p-value: 0.2497
```

```r
linearMod54 <- lm(formula = performance_rating ~ gender_Female + gender_Male, data=merit_raises_combined
summary(linearMod54)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.64714 -0.19583 -0.04714  0.20417  0.90417
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.39583    0.04602  73.786   <2e-16 ***
## gender_Female  0.05131    0.05975   0.859    0.392
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3189 on 116 degrees of freedom
##   (2 observations deleted due to missingness)
## Multiple R-squared:  0.006316,   Adjusted R-squared:  -0.00225
## F-statistic: 0.7373 on 1 and 116 DF,  p-value: 0.3923
```

```r
linearMod55 <- lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color, da
summary(linearMod55)
```

```
##
## Call:
## lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color,
```

```
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.63514 -0.23514 -0.03514  0.18837  0.88837
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.40000    0.32104  10.591   <2e-16 ***
## race_grouping_white            0.03514    0.32320   0.109    0.914
## race_grouping_person_of_color  0.01163    0.32475   0.036    0.971
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.321 on 115 degrees of freedom
##   (2 observations deleted due to missingness)
## Multiple R-squared:  0.001325,   Adjusted R-squared:  -0.01604
## F-statistic: 0.07628 on 2 and 115 DF,  p-value: 0.9266
```

```r
linearMod56 <- lm(formula = performance_rating ~ gender_Female + gender_Male + race_grouping_white + ra
summary(linearMod56)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = merit_raises_combined_salaried_regre
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.65112 -0.20182 -0.04513  0.20716  0.91016
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.35070    0.32750  10.231   <2e-16 ***
## gender_Female                  0.04930    0.06209   0.794    0.429
## gender_Male                         NA         NA      NA       NA
## race_grouping_white            0.05112    0.32435   0.158    0.875
## race_grouping_person_of_color  0.03915    0.32712   0.120    0.905
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3216 on 114 degrees of freedom
##   (2 observations deleted due to missingness)
## Multiple R-squared:  0.006818,   Adjusted R-squared:  -0.01932
## F-statistic: 0.2609 on 3 and 114 DF,  p-value: 0.8535
```

```r
linearMod57 <- lm(formula = performance_rating ~ gender_Female + gender_Male + age_group_5_under_25 + a
summary(linearMod57)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
```

```
##     age_group_5_65_over, data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.64015 -0.17720 -0.04015  0.15956  0.87133
##
## Coefficients: (3 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)           3.340445   0.090604  36.869   <2e-16 ***
## gender_Female         0.007333   0.072497   0.101   0.9196
## gender_Male                 NA         NA      NA       NA
## age_group_5_under_25 -0.040445   0.323985  -0.125   0.9009
## age_group_5_25to29    0.029423   0.119983   0.245   0.8067
## age_group_5_30to34    0.035438   0.128245   0.276   0.7828
## age_group_5_35to39    0.128850   0.117283   1.099   0.2744
## age_group_5_40to44    0.127223   0.154297   0.825   0.4115
## age_group_5_45to49   -0.019111   0.112599  -0.170   0.8655
## age_group_5_50to54    0.292376   0.131963   2.216   0.0288 *
## age_group_5_55to59    0.318889   0.166851   1.911   0.0586 .
## age_group_5_60to64          NA         NA      NA       NA
## age_group_5_65_over         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3111 on 108 degrees of freedom
##   (2 observations deleted due to missingness)
## Multiple R-squared:  0.1195, Adjusted R-squared:  0.04617
## F-statistic: 1.629 on 9 and 108 DF,  p-value: 0.1158
```

```r
linearMod58 <- lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color + a
summary(linearMod58)
```

```
##
## Call:
## lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.62288 -0.18117 -0.03998  0.15664  0.86318
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.366472   0.332970  10.110   <2e-16 ***
## race_grouping_white           -0.023117   0.320658  -0.072   0.9427
## race_grouping_person_of_color -0.043378   0.325240  -0.133   0.8942
## age_group_5_under_25          -0.043355   0.325176  -0.133   0.8942
## age_group_5_25to29             0.033528   0.115288   0.291   0.7718
## age_group_5_30to34             0.046149   0.119104   0.387   0.6992
## age_group_5_35to39             0.140343   0.123475   1.137   0.2582
## age_group_5_40to44             0.139243   0.143864   0.968   0.3353
## age_group_5_45to49            -0.006536   0.115233  -0.057   0.9549
```

```
## age_group_5_50to54            0.299782   0.125425   2.390   0.0186 *
## age_group_5_55to59            0.330065   0.157051   2.102   0.0379 *
## age_group_5_60to64                  NA         NA      NA       NA
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3124 on 107 degrees of freedom
##   (2 observations deleted due to missingness)
## Multiple R-squared:  0.1203, Adjusted R-squared:  0.03808
## F-statistic: 1.463 on 10 and 107 DF,  p-value: 0.1633
```

```
linearMod59 <- lm(formula = performance_rating ~ gender_Female + gender_Male + race_grouping_white + ra
summary(linearMod59)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = merit_raises_combined_salaried_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.62357 -0.18119 -0.04026  0.15697  0.86251
##
## Coefficients: (3 not defined because of singularities)
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.365646   0.336384  10.005   <2e-16 ***
## gender_Female                  0.001768   0.075435   0.023   0.9813
## gender_Male                          NA         NA      NA       NA
## race_grouping_white           -0.022617   0.322870  -0.070   0.9443
## race_grouping_person_of_color -0.042505   0.328885  -0.129   0.8974
## age_group_5_under_25          -0.043029   0.327001  -0.132   0.8956
## age_group_5_25to29             0.032585   0.122617   0.266   0.7909
## age_group_5_30to34             0.044783   0.133103   0.336   0.7372
## age_group_5_35to39             0.140115   0.124436   1.126   0.2627
## age_group_5_40to44             0.137660   0.159528   0.863   0.3901
## age_group_5_45to49            -0.007312   0.120416  -0.061   0.9517
## age_group_5_50to54             0.298661   0.134777   2.216   0.0288 *
## age_group_5_55to59             0.328498   0.171364   1.917   0.0579 .
## age_group_5_60to64                   NA         NA      NA       NA
## age_group_5_65_over                  NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3138 on 106 degrees of freedom
##   (2 observations deleted due to missingness)
## Multiple R-squared:  0.1203, Adjusted R-squared:  0.02901
## F-statistic: 1.318 on 11 and 106 DF,  p-value: 0.2247
```

```
commercial_hourly_regression <- commercial_hourly[,c('department','gender','race_ethnicity','current_ba
commercial_hourly_regression <- fastDummies::dummy_cols(commercial_hourly_regression, select_columns = 
```

```r
names(commercial_hourly_regression) <- gsub(' ', '_', names(commercial_hourly_regression))
names(commercial_hourly_regression) <- gsub('-', 'to', names(commercial_hourly_regression))
names(commercial_hourly_regression) <- gsub('\\+', '_over', names(commercial_hourly_regression))
names(commercial_hourly_regression) <- gsub('<', 'under_', names(commercial_hourly_regression))

linearMod60 <- lm(formula = current_base_pay ~ gender_Female + gender_Male, data=commercial_hourly_regre
summary(linearMod60)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male,
##     data = commercial_hourly_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -10.731  -4.314  -1.518   3.761  29.419
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    25.7881     0.7581  34.019  < 2e-16 ***
## gender_Female   3.9126     1.0684   3.662  0.00035 ***
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.477 on 145 degrees of freedom
## Multiple R-squared:  0.08466,    Adjusted R-squared:  0.07834
## F-statistic: 13.41 on 1 and 145 DF,  p-value: 0.0003499
```

```r
linearMod61 <- lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color, data
summary(linearMod61)
```

```
##
## Call:
## lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color,
##     data = commercial_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -11.2002  -4.4456  -0.9006   3.5548  28.1098
##
## Coefficients:
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     22.113      3.710   5.961 1.85e-08 ***
## race_grouping_white              8.897      3.837   2.319   0.0218 *
## race_grouping_person_of_color    4.427      3.764   1.176   0.2415
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.425 on 144 degrees of freedom
## Multiple R-squared:  0.1054, Adjusted R-squared:  0.09293
## F-statistic: 8.479 on 2 and 144 DF,  p-value: 0.0003303
```

```r
linearMod62 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod62)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = commercial_hourly_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -12.330  -3.851  -1.531   2.554  26.270
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     22.113      3.559   6.213 5.36e-09 ***
## gender_Female                    3.767      1.028   3.665 0.000348 ***
## gender_Male                         NA         NA      NA       NA
## race_grouping_white              6.969      3.719   1.874 0.062943 .
## race_grouping_person_of_color    2.488      3.650   0.682 0.496647
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.165 on 143 degrees of freedom
## Multiple R-squared:  0.1822, Adjusted R-squared:  0.165
## F-statistic: 10.62 on 3 and 143 DF,  p-value: 2.4e-06
```

```
linearMod63 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + age_group_5_under_25 + age_
summary(linearMod63)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = commercial_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -11.3940  -3.8376  -0.9446   3.1079  28.4860
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)          24.30914    1.97881  12.285  < 2e-16 ***
## gender_Female         3.75388    1.08589   3.457 0.000729 ***
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25 -0.03328    2.71181  -0.012 0.990225
## age_group_5_25to29    3.14429    2.35523   1.335 0.184098
## age_group_5_30to34    3.14160    2.86587   1.096 0.274924
## age_group_5_35to39    6.17705    2.60480   2.371 0.019123 *
## age_group_5_40to44    0.95164    2.47439   0.385 0.701137
## age_group_5_45to49    2.57102    2.45973   1.045 0.297765
## age_group_5_50to54   -0.40099    2.43587  -0.165 0.869487
## age_group_5_55to59    0.60055    2.49206   0.241 0.809931
## age_group_5_60to64   -0.80863    2.60371  -0.311 0.756604
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 6.356 on 136 degrees of freedom
## Multiple R-squared:  0.1733, Adjusted R-squared:  0.1125
## F-statistic: 2.851 on 10 and 136 DF,  p-value: 0.00298
```

```
linearMod64 <- lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color + age
summary(linearMod64)
```

```
##
## Call:
## lm(formula = current_base_pay ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = commercial_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -10.4844  -3.8899  -0.9866   3.0028  27.2032
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    17.8158     4.1801   4.262 3.78e-05 ***
## race_grouping_white            10.8972     3.8021   2.866  0.00482 **
## race_grouping_person_of_color   6.6583     3.7576   1.772  0.07866 .
## age_group_5_under_25           -0.3745     2.6699  -0.140  0.88864
## age_group_5_25to29              3.5514     2.3257   1.527  0.12909
## age_group_5_30to34              5.0083     2.8306   1.769  0.07909 .
## age_group_5_35to39              6.0117     2.5857   2.325  0.02156 *
## age_group_5_40to44              3.3295     2.4475   1.360  0.17598
## age_group_5_45to49              3.2038     2.4333   1.317  0.19018
## age_group_5_50to54             -0.4921     2.3985  -0.205  0.83776
## age_group_5_55to59              1.2226     2.4532   0.498  0.61905
## age_group_5_60to64              0.1069     2.5775   0.041  0.96698
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.261 on 135 degrees of freedom
## Multiple R-squared:  0.2035, Adjusted R-squared:  0.1386
## F-statistic: 3.136 on 11 and 135 DF,  p-value: 0.0008472
```

```
linearMod65 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod65)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = commercial_hourly_regression)
##
## Residuals:
```

```
##      Min       1Q   Median       3Q      Max
## -11.4252  -3.9045  -0.7517   2.7593  25.1857
##
## Coefficients: (2 not defined because of singularities)
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                  18.35904    4.04063   4.544 1.22e-05 ***
## gender_Female                 3.43733    1.04958   3.275  0.00135 **
## gender_Male                        NA         NA      NA       NA
## race_grouping_white           8.78809    3.72820   2.357  0.01986 *
## race_grouping_person_of_color  4.55451    3.68554   1.236  0.21870
## age_group_5_under_25         -0.06206    2.58039  -0.024  0.98085
## age_group_5_25to29            2.83157    2.25695   1.255  0.21181
## age_group_5_30to34            4.27783    2.74288   1.560  0.12121
## age_group_5_35to39            6.09079    2.49738   2.439  0.01604 *
## age_group_5_40to44            2.34053    2.38306   0.982  0.32779
## age_group_5_45to49            3.34986    2.35050   1.425  0.15643
## age_group_5_50to54           -0.07588    2.32001  -0.033  0.97396
## age_group_5_55to59            0.85121    2.37207   0.359  0.72027
## age_group_5_60to64            0.08175    2.48936   0.033  0.97385
## age_group_5_65_over                NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.047 on 134 degrees of freedom
## Multiple R-squared:  0.2625, Adjusted R-squared:  0.1965
## F-statistic: 3.975 on 12 and 134 DF,  p-value: 2.988e-05
```

```r
linearMod66 <- lm(formula = current_base_pay ~ gender_Female + gender_Male + race_grouping_white + race_
summary(linearMod66)
```

```
##
## Call:
## lm(formula = current_base_pay ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over +
##     years_of_service_grouped_0 + years_of_service_grouped_1to2 +
##     years_of_service_grouped_3to5 + years_of_service_grouped_6to10 +
##     years_of_service_grouped_11to15 + years_of_service_grouped_16to20 +
##     years_of_service_grouped_21to25 + years_of_service_grouped_25_over,
##     data = commercial_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -11.3880  -3.2873  -0.7906   2.6392  24.8288
##
## Coefficients: (3 not defined because of singularities)
##                                 Estimate Std. Error t value Pr(>|t|)
## (Intercept)                     18.71412    4.45884   4.197 5.04e-05 ***
## gender_Female                    3.04122    1.25333   2.427   0.0166 *
## gender_Male                           NA         NA      NA       NA
## race_grouping_white              8.52247    4.05027   2.104   0.0373 *
## race_grouping_person_of_color    4.04668    3.96852   1.020   0.3098
## age_group_5_under_25            -0.43984    3.05384  -0.144   0.8857
```

```
## age_group_5_25to29               2.31526    2.80073   0.827   0.4100
## age_group_5_30to34               4.90639    3.20985   1.529   0.1289
## age_group_5_35to39               5.89797    2.79979   2.107   0.0371 *
## age_group_5_40to44               2.40918    2.73489   0.881   0.3800
## age_group_5_45to49               2.82012    2.60479   1.083   0.2810
## age_group_5_50to54              -0.30475    2.48080  -0.123   0.9024
## age_group_5_55to59               0.92733    2.44641   0.379   0.7053
## age_group_5_60to64              -0.40829    2.66712  -0.153   0.8786
## age_group_5_65_over                   NA         NA      NA       NA
## years_of_service_grouped_0      -0.14159    2.73822  -0.052   0.9588
## years_of_service_grouped_1to2    1.19324    2.56055   0.466   0.6420
## years_of_service_grouped_3to5   -0.97287    2.76173  -0.352   0.7252
## years_of_service_grouped_6to10   0.04366    2.54249   0.017   0.9863
## years_of_service_grouped_11to15  0.46224    2.81566   0.164   0.8699
## years_of_service_grouped_16to20  0.98286    2.41854   0.406   0.6851
## years_of_service_grouped_21to25  2.57982    2.83996   0.908   0.3654
## years_of_service_grouped_25_over      NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.156 on 127 degrees of freedom
## Multiple R-squared:  0.2757, Adjusted R-squared:  0.1673
## F-statistic: 2.544 on 19 and 127 DF,  p-value: 0.001075
```

```r
merit_raises_combined_hourly_regression <- filter(merit_raises_combined, dept == 'Commercial', pay_rate_

merit_raises_combined_hourly_regression <- fastDummies::dummy_cols(merit_raises_combined_hourly_regressi
names(merit_raises_combined_hourly_regression) <- gsub(' ', '_', names(merit_raises_combined_hourly_reg
names(merit_raises_combined_hourly_regression) <- gsub('-', 'to', names(merit_raises_combined_hourly_re
names(merit_raises_combined_hourly_regression) <- gsub('\\+', '_over', names(merit_raises_combined_hour
names(merit_raises_combined_hourly_regression) <- gsub('<', 'under_', names(merit_raises_combined_hourly

linearMod67 <- lm(formula = base_pay_change ~ gender_Female + gender_Male, data=merit_raises_combined_ho
summary(linearMod67)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male, data = merit_raises_combined_hourly_regre
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.35809 -0.12809 -0.03789  0.07230  1.08191
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.34770    0.01886  18.434  < 2e-16 ***
## gender_Female  0.11039    0.02618   4.217 3.43e-05 ***
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2117 on 260 degrees of freedom
## Multiple R-squared:  0.06401,    Adjusted R-squared:  0.06041
## F-statistic: 17.78 on 1 and 260 DF,  p-value: 3.427e-05
```

```r
linearMod68 <- lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color, data=
summary(linearMod68)
```

```
##
## Call:
## lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.36944 -0.13105 -0.04944  0.07895  1.07056
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    0.38105    0.01558  24.464  < 2e-16 ***
## race_grouping_white            0.08839    0.02992   2.954  0.00342 **
## race_grouping_person_of_color       NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2153 on 260 degrees of freedom
## Multiple R-squared:  0.03247,    Adjusted R-squared:  0.02875
## F-statistic: 8.727 on 1 and 260 DF,  p-value: 0.003423
```

```r
linearMod69 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod69)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = merit_raises_combined_hourly_regressi
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.42912 -0.11989 -0.05686  0.08011  1.01088
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    0.31989    0.02037  15.700  < 2e-16 ***
## gender_Female                  0.11452    0.02573   4.450 1.28e-05 ***
## gender_Male                         NA         NA      NA       NA
## race_grouping_white            0.09471    0.02893   3.274  0.00121 **
## race_grouping_person_of_color       NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2079 on 259 degrees of freedom
## Multiple R-squared:  0.1012, Adjusted R-squared:  0.09426
## F-statistic: 14.58 on 2 and 259 DF,  p-value: 9.987e-07
```

```r
linearMod70 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + age_group_5_under_25 + age_g
summary(linearMod70)
```

```
##
## Call:
```

```
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.36671 -0.12659 -0.03807  0.09317  1.10473
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)           0.28807    0.04187   6.880 4.76e-11 ***
## gender_Female         0.10705    0.02859   3.744 0.000224 ***
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25  0.23052    0.10196   2.261 0.024625 *
## age_group_5_25to29    0.04015    0.06040   0.665 0.506887
## age_group_5_30to34    0.09536    0.06767   1.409 0.160013
## age_group_5_35to39    0.18773    0.06092   3.082 0.002289 **
## age_group_5_40to44    0.08816    0.05992   1.471 0.142450
## age_group_5_45to49    0.08158    0.05712   1.428 0.154453
## age_group_5_50to54    0.01802    0.05554   0.324 0.745869
## age_group_5_55to59    0.04244    0.05497   0.772 0.440778
## age_group_5_60to64    0.02171    0.05503   0.394 0.693592
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2081 on 251 degrees of freedom
## Multiple R-squared:  0.127,  Adjusted R-squared:  0.09219
## F-statistic: 3.651 on 10 and 251 DF,  p-value: 0.000145
```

```r
linearMod71 <- lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color + age_
summary(linearMod71)
```

```
##
## Call:
## lm(formula = base_pay_change ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.34399 -0.12826 -0.03793  0.08002  1.09654
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    0.28793    0.04257   6.763 9.42e-11 ***
## race_grouping_white            0.08634    0.03092   2.792  0.00564 **
## race_grouping_person_of_color       NA         NA      NA       NA
## age_group_5_under_25           0.23480    0.10317   2.276  0.02370 *
## age_group_5_25to29             0.06919    0.05994   1.154  0.24953
## age_group_5_30to34             0.16213    0.06621   2.449  0.01502 *
```

```
## age_group_5_35to39            0.17782    0.06207   2.865  0.00452 **
## age_group_5_40to44            0.15605    0.05749   2.714  0.00710 **
## age_group_5_45to49            0.13514    0.05623   2.403  0.01697 *
## age_group_5_50to54            0.04568    0.05552   0.823  0.41139
## age_group_5_55to59            0.08178    0.05453   1.500  0.13492
## age_group_5_60to64            0.04124    0.05549   0.743  0.45802
## age_group_5_65_over                NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2106 on 251 degrees of freedom
## Multiple R-squared:  0.106,  Adjusted R-squared:  0.07036
## F-statistic: 2.975 on 10 and 251 DF,  p-value: 0.001468
```

```
linearMod72 <- lm(formula = base_pay_change ~ gender_Female + gender_Male + race_grouping_white + race_g
summary(linearMod72)
```

```
##
## Call:
## lm(formula = base_pay_change ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.37347 -0.12809 -0.03730  0.07365  1.06653
##
## Coefficients: (3 not defined because of singularities)
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    0.267098   0.041599   6.421 6.78e-10 ***
## gender_Female                  0.115674   0.028184   4.104 5.50e-05 ***
## gender_Male                          NA         NA      NA       NA
## race_grouping_white            0.097972   0.030125   3.252  0.00130 **
## race_grouping_person_of_color        NA         NA      NA       NA
## age_group_5_under_25           0.230173   0.100069   2.300  0.02226 *
## age_group_5_25to29            -0.007271   0.061049  -0.119  0.90529
## age_group_5_30to34             0.092451   0.066419   1.392  0.16518
## age_group_5_35to39             0.161822   0.060321   2.683  0.00779 **
## age_group_5_40to44             0.078351   0.058884   1.331  0.18453
## age_group_5_45to49             0.081860   0.056060   1.460  0.14548
## age_group_5_50to54             0.009004   0.054584   0.165  0.86911
## age_group_5_55to59             0.037571   0.053968   0.696  0.48697
## age_group_5_60to64             0.022601   0.054009   0.418  0.67596
## age_group_5_65_over                  NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2043 on 250 degrees of freedom
## Multiple R-squared:  0.1624, Adjusted R-squared:  0.1256
## F-statistic: 4.407 on 11 and 250 DF,  p-value: 4.681e-06
```

```r
linearMod73 <- lm(formula = performance_rating ~ gender_Female + gender_Male, data=merit_raises_combined
summary(linearMod73)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.6541 -0.2254 -0.0254  0.1459  0.8459
##
## Coefficients: (1 not defined because of singularities)
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    3.22540    0.02192 147.173  < 2e-16 ***
## gender_Female  0.12868    0.03047   4.223 3.34e-05 ***
## gender_Male         NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.246 on 259 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.06441,    Adjusted R-squared:  0.0608
## F-statistic: 17.83 on 1 and 259 DF,  p-value: 3.344e-05
```

```r
linearMod74 <- lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color, da
summary(linearMod74)
```

```
##
## Call:
## lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color,
##     data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.57737 -0.23099 -0.03099  0.16901  0.92263
##
## Coefficients: (1 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.27737    0.01837 178.418   <2e-16 ***
## race_grouping_white            0.05362    0.03522   1.522    0.129
## race_grouping_person_of_color       NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2532 on 259 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.008869,   Adjusted R-squared:  0.005043
## F-statistic: 2.318 on 1 and 259 DF,  p-value: 0.1291
```

```r
linearMod75 <- lm(formula = performance_rating ~ gender_Female + gender_Male + race_grouping_white + rac
summary(linearMod75)
```

```
##
## Call:
```

```
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color, data = merit_raises_combined_hourly_regress
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.63883 -0.20762 -0.03883  0.16117  0.86117
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.20762    0.02401 133.570  < 2e-16 ***
## gender_Female                  0.13121    0.03038   4.319 2.24e-05 ***
## gender_Male                         NA         NA      NA       NA
## race_grouping_white            0.06053    0.03411   1.774   0.0772 .
## race_grouping_person_of_color       NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.245 on 258 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.07569,    Adjusted R-squared:  0.06853
## F-statistic: 10.56 on 2 and 258 DF,  p-value: 3.893e-05
```

```
linearMod76 <- lm(formula = performance_rating ~ gender_Female + gender_Male + age_group_5_under_25 + ag
summary(linearMod76)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.59991 -0.19415 -0.01871  0.15558  0.85594
##
## Coefficients: (2 not defined because of singularities)
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)           3.10402    0.04884  63.560  < 2e-16 ***
## gender_Female         0.09989    0.03341   2.990  0.00307 **
## gender_Male                NA         NA      NA       NA
## age_group_5_under_25  0.09600    0.11891   0.807  0.42023
## age_group_5_25to29    0.14051    0.07046   1.994  0.04720 *
## age_group_5_30to34    0.11372    0.07893   1.441  0.15091
## age_group_5_35to39    0.20510    0.07105   2.887  0.00423 **
## age_group_5_40to44    0.22366    0.06989   3.200  0.00155 **
## age_group_5_45to49    0.11480    0.06662   1.723  0.08610 .
## age_group_5_50to54    0.14015    0.06478   2.163  0.03145 *
## age_group_5_55to59    0.19049    0.06437   2.959  0.00338 **
## age_group_5_60to64    0.09014    0.06418   1.404  0.16142
## age_group_5_65_over        NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 0.2427 on 250 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.1209, Adjusted R-squared:  0.08575
## F-statistic: 3.439 on 10 and 250 DF,  p-value: 0.0003027
```

```
linearMod77 <- lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color + a
summary(linearMod77)
```

```
##
## Call:
## lm(formula = performance_rating ~ race_grouping_white + race_grouping_person_of_color +
##     age_group_5_under_25 + age_group_5_25to29 + age_group_5_30to34 +
##     age_group_5_35to39 + age_group_5_40to44 + age_group_5_45to49 +
##     age_group_5_50to54 + age_group_5_55to59 + age_group_5_60to64 +
##     age_group_5_65_over, data = merit_raises_combined_hourly_regression)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.53801 -0.17477 -0.01916  0.16199  0.91980
##
## Coefficients: (2 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)
## (Intercept)                    3.11171    0.04980  62.481  < 2e-16 ***
## race_grouping_white            0.04145    0.03619   1.145 0.253240
## race_grouping_person_of_color       NA         NA      NA       NA
## age_group_5_under_25           0.10000    0.12070   0.829 0.408159
## age_group_5_25to29             0.18441    0.07013   2.630 0.009075 **
## age_group_5_30to34             0.17509    0.07745   2.261 0.024643 *
## age_group_5_35to39             0.20581    0.07261   2.835 0.004963 **
## age_group_5_40to44             0.28863    0.06725   4.292 2.54e-05 ***
## age_group_5_45to49             0.16306    0.06578   2.479 0.013840 *
## age_group_5_50to54             0.16849    0.06495   2.594 0.010041 *
## age_group_5_55to59             0.22630    0.06414   3.528 0.000498 ***
## age_group_5_60to64             0.10745    0.06491   1.655 0.099138 .
## age_group_5_65_over                 NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.2464 on 250 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.09424,    Adjusted R-squared:  0.05801
## F-statistic: 2.601 on 10 and 250 DF,  p-value: 0.005093
```

```
linearMod78 <- lm(formula = performance_rating ~ gender_Female + gender_Male + race_grouping_white + rac
summary(linearMod78)
```

```
##
## Call:
## lm(formula = performance_rating ~ gender_Female + gender_Male +
##     race_grouping_white + race_grouping_person_of_color + age_group_5_under_25 +
##     age_group_5_25to29 + age_group_5_30to34 + age_group_5_35to39 +
##     age_group_5_40to44 + age_group_5_45to49 + age_group_5_50to54 +
##     age_group_5_55to59 + age_group_5_60to64 + age_group_5_65_over,
##     data = merit_raises_combined_hourly_regression)
##
```

```
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -0.59314 -0.18358 -0.01585  0.13979  0.86727 
## 
## Coefficients: (3 not defined because of singularities)
##                               Estimate Std. Error t value Pr(>|t|)    
## (Intercept)                    3.09296    0.04932  62.706  < 2e-16 ***
## gender_Female                  0.10436    0.03348   3.117  0.00204 ** 
## gender_Male                         NA         NA      NA       NA    
## race_grouping_white            0.05172    0.03573   1.447  0.14903    
## race_grouping_person_of_color       NA         NA      NA       NA    
## age_group_5_under_25           0.09583    0.11865   0.808  0.42008    
## age_group_5_25to29             0.11553    0.07239   1.596  0.11177    
## age_group_5_30to34             0.11223    0.07876   1.425  0.15544    
## age_group_5_35to39             0.19143    0.07152   2.677  0.00793 ** 
## age_group_5_40to44             0.21854    0.06983   3.129  0.00196 ** 
## age_group_5_45to49             0.11499    0.06648   1.730  0.08492 .  
## age_group_5_50to54             0.13542    0.06472   2.092  0.03743 *  
## age_group_5_55to59             0.18769    0.06426   2.921  0.00381 ** 
## age_group_5_60to64             0.09062    0.06404   1.415  0.15829    
## age_group_5_65_over                 NA         NA      NA       NA    
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 0.2422 on 249 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.1283, Adjusted R-squared:  0.08974 
## F-statistic:  3.33 on 11 and 249 DF,  p-value: 0.0002689
```