An Analysis of Collegiate Factors that Influence a Recent College Graduate's Starting Salary

Senior thesis submitted in partial satisfaction of the requirements for the degree in
Bachelor of Arts
in
Mathematics with Applied Emphasis

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Abstract

Starting salary can be one of the most influential factors in a recent college graduate's decision to accept a job offer. However, not every candidate will receive the same starting salary offer due to his or her varying qualifications. The question remains: what factors have influence on a starting salary and what factors do not? Factors such as GPA, involvement in undergraduate research, the number of math courses taken, study abroad experience, and participation in an internship may all influence a new graduate's starting salary.

Although many people have researched this topic throughout time, some of the interactions that this paper will explore have not been extensively studied. For example, the interaction between starting salary and the highest level of math that the person was required to take has yet to be explored. Prior studies commonly test the correlation between starting salary and a person's mathematics SAT score. However, this may not be an accurate representation of the individual's mathematical skills if they further their studies of math in college. Furthermore, this paper will take a look at the relationship (if any) between starting salary and studying abroad, which is commonly neglected in related studies. Overall, this paper will take into consideration previous research related to the starting salaries of recent post-graduates while determining what factors to analyze.

The data was collected online by surveying recent alumni to suggest which factors most influence graduate starting salaries. This project will implement t-tests as well as multiple linear regression models to analyze the data to determine which factors have relevance and correlation. This study will highlight the differences found and compare the results. Furthermore, this study will implement QQ Plotting to test the normality of the data and Chi Square Tests for Association to test for association between two categorical variables. The study will ultimately develop a model to predict a rough estimate of a person's starting salary and thus provide an undergraduate student with an idea of their future starting salary.

Acknowledgements

We would firstly like to thank our advisors, Dr. Ani Velo, Dr. Jane Friedman, and Dr. Cameron Parker, for being such a tremendous help to us during the past few months, for providing invaluable input, and for making this senior thesis possible. We would also like to thank the Department of Mathematics and Computer Science for providing us with this opportunity to conduct research and with invaluable academic experiences throughout our time at the University of San Diego.

Furthermore, we would like to thank our parents, friends, and family for giving us so much support throughout this entire thesis process. We could not have completed this thesis without all of your encouraging words.

1 Motivation and Goals

The primary motivation behind writing this paper was to provide undergraduate students with insight as to what to expect their starting salary to be upon graduation. Prior research has primarily focused on what majors result in the highest starting salaries (Low). Alternatively, this paper digs deeper into the college academic experience by exploring what other factors will have an influence on a starting salary and thus would be worth considering. This study will help a student with a particular major decide whether applying for internships, studying abroad, or conducting research would contribute to a higher starting salary. So, the major question that was asked with undergraduates in mind was, "What can an underclassman do to earn a high starting salary while studying a subject that interests them?"

Overall, it is clear that a graduating senior does not have control of their starting salary when they are applying for jobs because their college career has already come to an end. However, graduating seniors could also use the contents of this paper to determine a rough estimate of what their starting salary should be when applying for jobs. Upon graduating, undergraduates are thrown into a world that they, for the most part, know nothing about. Graduating seniors can use this research to help him or her determine whether or not to negotiate a proposed starting salary. So, the major question that was asked with seniors in mind was, "Should a senior negotiate their salary given their undergraduate experiences?"

Furthermore, undergraduates can use the contents of this paper in order to plan their academic careers in accordance with their desired starting salary. As graduating seniors, we think that it would have been beneficial to have seen the results of this study as underclassmen when we were exploring whether or not to partake in academic extracurricular activities. Underclassmen of all majors would be able to utilize the results of this paper by designing a checklist of things to accomplish before graduating to obtain the highest starting salary possible. They may also benefit from knowing which activities will not substantially increase their starting salary.

This project could also benefit various departments on campus. Based on the results of this research, advisors could better advise their students to get on the right track to be successful after graduation. There may be content in this paper that perhaps advisors had considered beforehand

or perhaps, in the recent years, some variables have had a stronger effect than others (i.e. perhaps nowadays a business major's salary is relatively higher if they've had an internship during their undergraduate years).

2 Data Collection

The data for this project was collected through an online Google survey. This survey asked individuals to answer questions regarding their gender, college major, college minor, highest level of math course taken in college, GPA, and starting salary. The survey also asked whether or not they had an internship, undergraduate research experience, or studied abroad during their time as an undergraduate student. These were the only potential factors considered when analyzing what affects a recent graduate's starting salary.

The survey was posted online on Facebook in order to attract personal friends and family as well as their personal friends and family. Furthermore, the survey was sent to past alumni through the various alumni departments on the University of San Diego campus.

There are a few potential drawbacks regarding the sample group obtained through the survey. Although the desired number of respondents was obtained, this project could have been stronger if more people had taken the survey. A larger sample size would strengthen the validity of our conclusions and increase the chances of the data having a normal distribution. In addition, a larger sample size would have provided us with more specific conclusions regarding the influential factors of every individual major surveyed. This paper only takes a look at categories of majors, such as Accounting/Economics/Finance, Other Business, etc. Furthermore, the sample group may have biased data. First, most of the respondents are likely to be University of San Diego graduates who will have biases based on social standards, an emphasis on educational success, and private school values and educational opportunities. Also, those respondents who did not attend the University of San Diego will most likely be personal friends and friends of friends, which creates more bias as many of these individuals will share similar characteristics and have similar backgrounds.

3 Prior Research: What Affects a Starting Salary?

Starting salary can be one of the most influential factors in a college graduate's decision to accept a job offer. It is also widely known that not every candidate will receive the same starting salary offer due to his or her varying qualifications. The question remains: what factors have influence on a starting salary and what factors do not? As the job market becomes more demanding and requires higher and higher skill sets to make a person more qualified, people of all fields have tried to answer this pressing question.

Although many people have researched this topic throughout time, some of the interactions that this paper will explore have not been extensively studied (based on all references). For example, the interaction between starting salary and the highest level of math that the person was required to take has not been explored. Prior studies commonly test the correlation between starting salary and a person's mathematics SAT score, which may not be an accurate representation of the individual's mathematical skills if they further their studies of math in college (Low, Oehrlein). So, this thesis will explore the potential correlation between taking higher level math courses and starting salary instead. In addition, the highest level of math course taken may entice employers to offer a higher starting salary due to the positive connotations of having a mathematical skills, such as being an analytical, logical thinker. Most jobs also require employees to have simple math abilities, so having a strong math background may also impress employers.

Furthermore, this paper will take a look at the relationship (if any) between starting salary and studying abroad, which is commonly neglected in related studies (based on all references). Overall, this paper will take into consideration previous research related to the starting salaries of recent post-graduates while determining what factors actually influence income.

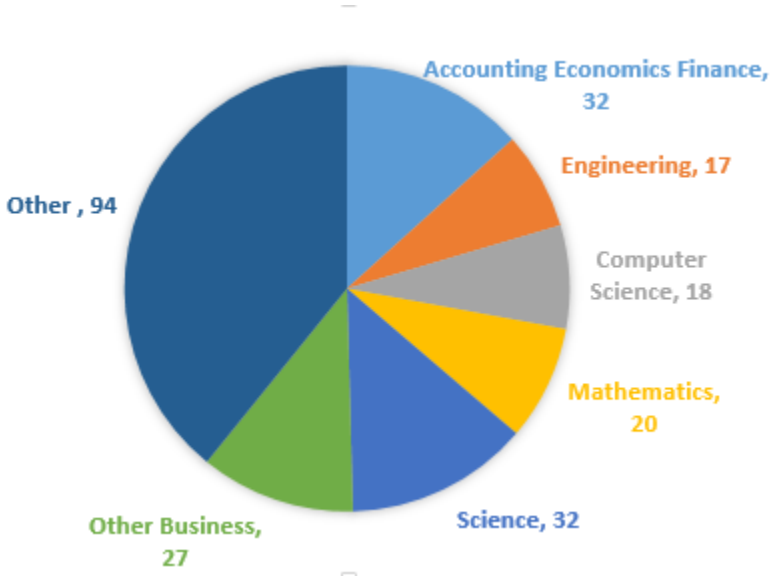
To start at the most basic level, much research has been compiled to show that attaining a college education is critical when it comes to a starting salary. Mark Schneider, for instance, is one such person who studied the correlation between higher education and starting salary (Schneider). His results showed that the return on investment is generally high enough for college graduates to compensate for the abundant expenses required for attendance. The research focused on

community college students who had graduated with an associate's degree, and based on this research, Schneider concluded that completing college and and transferring to four-year institutions will generally increase an individual's salary. So, the research conducted in this senior thesis was conducted under the assumption that the survey respondents had attained a college education due to the extensive research showing the positive correlation between starting salary and higher education (Schneider).

Past research have also concluded that GPA, major, SAT math scores, age, and work experience all have positive correlations with income (Oehrlein). On the other hand, SAT verbal scores, race, and gender prove to be insignificant determinants towards income (Oehrlein). When the factors explored in this paper were selected, we kept these results in mind and wanted to test some of their validity (in particular, GPA, major, and gender). Oehrlein reasons GPA positively affects starting salary because employers use grades as a tool to judge applicants, so students with higher GPAs are likely to get better jobs. Employers will believe that the students who study and work hard will likely perform well in a business environment as well (Oehrlein). He also reasons that a student's choice of major is highly influential in determining his or her starting salary because of the varying degrees of demand that a position may require. So, if a student would like to earn a high starting salary but has no preference of major, he or she should select one of the majors with the highest starting salary. Finally, Oehrlein's research shows that gender does not significantly affect starting salary, most likely due to the increased opportunities for women and the increased desire to work full-time among women during the past 30-40 years (Oehrlein).

4 Data Distribution and General Statistics

After sending out the survey via Facebook and various departments' alumni networks at the University of San Diego, the survey generated 241 responses. All of the responses were then sorted into categories based on the individual's major. The selected categories were: Accounting/Economics/Finance, Computer Science, Engineering, Mathematics, Science, Other Business, and Other. The data distribution is displayed in the form of a pie chart below.



Notice that the "Other" category contained the highest number of responses and thus, this data was the easiest to work with.

Displayed below are some general statistics found after conducting the survey.

Major	Avg. GPA	Avg. Level of Math	Avg. Starting Salary
Accounting, Economics, Finance	3.5-3.75	Calculus I-Calculus II	$50,000-$60,000
Computer Science	3.25-3.5	Calculus II-Calculus III	$60,000-$70,000
Engineering	3.25-3.5	Calculus III-Math Minor	$50,000-$60,000
Mathematics	3.5-3.75	Math Major	$40,000-$50,000
Science	3.5-3.75	Calculus I-Calculus II	$30,000-$40,000
Other Business	3.5	Calculus I	$40,000-$50,000
Other	3.5-3.75	College Algebra-Calculus I	$30,000-$40,000

Since GPA and salary were grouped into intervals, we can only provide an interval estimate for the averages in each major category.

5 Limitations of the Data

With every research project comes limitations. One of the limitations of this research was the potential biases that may have resulted when the survey was sent out exclusively to students from the University of San Diego, personal friends, and friends of friends. These biases were previously discussed in detail in the Data Collection section on page 4.

Furthermore, after looking back on this research, we realized that we should have grouped the majors into different, more broad categories. Grouping all of the science, technology, engineering, and mathematics (STEM) majors together would have also been a good option. However, the motivation for choosing the categories used in this paper was because as a STEM majors, we were curious about statistics specifically in the STEM fields. So, the focus was shifted towards these majors by isolating them into their own categories.

It was also a bit difficult to do some of the analysis because when creating the survey, we decided to use intervals for salaries rather than exact salaries because we anticipated that people would be less inclined to respond if they had to type in their actual salary. Although the survey was anonymous, it seems as though this would bring some discomfort to the individuals responding to the survey. So, the average value was used in all of the calculations regarding starting salary in this research paper, which may have caused some slight discrepancies and calculation errors. The same applies for GPA.

Finally, the survey did generate a limited sample size and thus, this sample size may not be reflective of the general undergraduate population as discussed in the Data Collection section on page 4.

6 Statistical Methods

In this research paper, the following methods have been used to analyze the survey data: t-testing, chi-square testing for association, QQ plotting, and multivariable regression modeling.

T-Test

The t-test is used to compare whether two groups have different average starting salaries. A t-test is conducted with a null hypothesis that assumes that the means of the starting salaries of the two groups are the same. In contrast, the alternative hypothesis states that the two means are not equal. Once the t-test is conducted, the results will be in the form of a p-value. In this project, we decided that our level of significance would be 0.1 (meaning that $\alpha=0.1$). If the t-test produces a p-value that is below 0.1, the null hypothesis can be rejected, and it can be assumed that belonging to group 1 versus group 2 will have an effect on starting salary. So, the observed factor will indeed affect a person's starting salary. However, if the p-value is greater than 0.1, the factor will not have a substantial impact on starting salary.

Overall, this project will implement the t-test by taking a look at opposing groups from our categorical variables, such as those who had an internship in college in comparison to those who did not have an internship. The t-tests will ultimately determine which differences between average starting salaries are actually significant.

This study will also impose outlier treatments for the t-tests. For each major category, those whose salaries are below $10,000 and those whose salaries are above $100,000 will be removed, and the t-test for each categorical variable will be rerun. This is done to test whether or not those extraneous observations are artificially raising or lowering the mean and thus, affecting the p-value. By removing these extraneous values, we also hoped to receive a more normal distribution of responses, which would reflect a more true undergraduate population without the biases we had in our data.

Chi-Square Test for Association

The Chi-Square Test for Association is a form of chi-square testing used to determine whether two categorical variables are independent or associated. The null hypothesis states that the variables are independent, meaning that they do not influence each other. The alternative hypothesis states that the variables are not independent and are thus associated.

This test was used to make sure that certain factors were independent and that there was no other factor associated with another that would distort the results. An example of two factors being associated would be if someone does not have a chance to apply for an internship because they studied abroad instead, or if someone had an internship and therefore was unable to study abroad.

This method was carried out via MiniTab. First, the samples were displayed in a contingency table with a frequency count in each cell. Then, the test was run via MiniTab. The conclusion of this test was assessed based on the observed p-value where a p-value less than 0.1 resulted in the rejection of the null hypothesis. This study does not require chi-square testing for all possible combinations of categorical variables, and we only ran tests on those variables where there was a significant increase in p-value (a jump of 0.05 or greater) during the process of running the multivariable linear regression models.

QQ Plots

QQ plots are a graphical method that will test to see whether the data came from a normal distribution and would thus be representative of a more general population. QQ plots display the approximate 90% confidence intervals for the percentiles. The confidents are point-wise so they are calculated separately for each point on the fitted distribution. The QQ plot also displays a table with distribution parameters: mean, standard deviation, and number of observations. The QQ plots also come with the Anderson-Darling statistic and the p-value. A p-value greater than 0.1 will indicate that the normal distribution appears to fit the sample data fairly well.

Multivariable Linear Regression Models

A multivariable linear regression attempts to model the relationship between multiple variables and a response variable by fitting a linear equation to the observed data. This analysis will take into account the relevant factors influencing a starting salary and will weigh them according to the

amount of influence they had. After running the regression, each variable will have its own coefficient and p-value. The model will be in the form of a linear equation that will give a rough estimate of a starting salary and will look like the following:

Income = a + X1(GPA) + X2(Major) + X3(Minor) + X4(Internship) + X5(Undergraduate Research) + X6(Study Abroad) + X7(Gender) +X8(Highest Level of Math Class Taken)

Variables

- Income (Dependent): In the survey, income was put in intervals of $10,000 ranging from $0 to $100,000 in order to better appeal to surveyees. For particularly high salaries, in order to avoid creating too many intervals, salaries above $100,000 were all grouped together in the "More than $100,000" category. For modeling purposes, the average will be used (i.e. $10,000-$20,000 will be $15,000), and those that made over $100,000 will be represented by $105,000.
- GPA: GPA, like income, was put in intervals of .25 ranging from 2.0 to 4.0 in order to better appeal to surveyees. Thus, for the modeling purposes, the average will be used as well.
- Gender: A 0 will denote a male and a 1 will denote a female in our data collection.
- Internship/Undergraduate Research/Study Abroad: A 1 denotes that the individual did undertake the variable in their undergraduate years while a 0 denotes that the person did not undertake the variable.
- Highest Level of Math Class Taken: The level of math course taken will be denoted in a range of 0-5 from lowest to highest level of math class taken (a 0 denotes none, a 1 denotes College Algebra, a 2 denotes Survey of Calculus/Calculus I, a 3 denotes Calculus II, a 4 denotes Calculus III, a 5 denotes above Calculus III (in which case they were a math major or minor))

The process of conducting a multivariable linear regression involves using a statistical software (in this case, we used MiniTab), which will initially take into account every potential factor that may influence starting salary. Then, the highest p-value will be eliminated, and then the regression

will be run again. This cycle will continue until all of the p-values have a 0.1 level of significance and thus, all of the remaining factors with p-values less than 0.1 have an effect on starting salary.

7 Results

Accounting, Economics, Finance

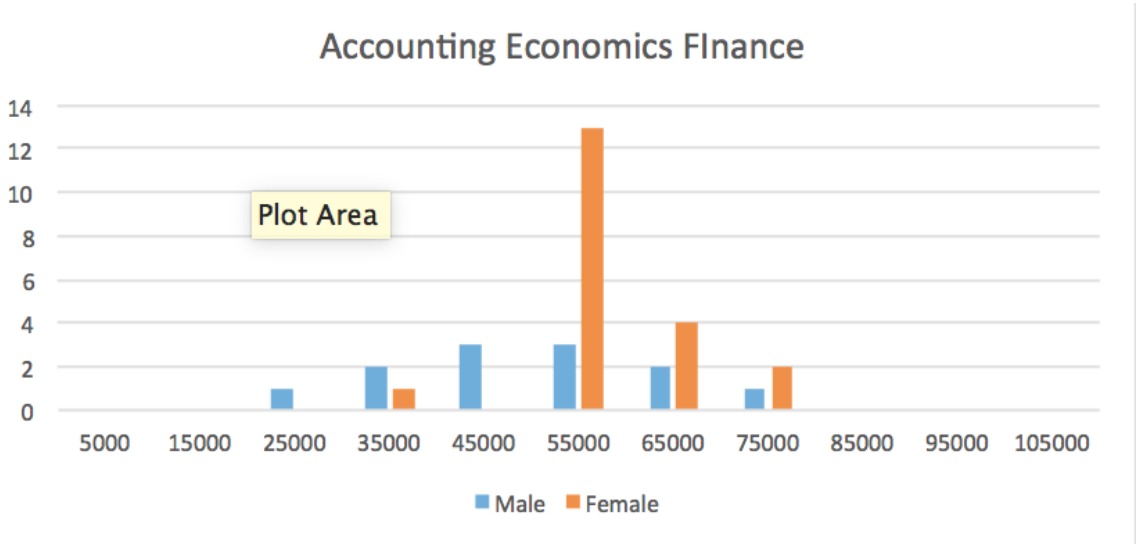
	p-value (original)	p-value (adjusted)	
Accounting, Economics, Finance			
Gender	0.102	n/a	
Internship	0.179	n/a	
Study Abroad	0.064	n/a	
Research	0.033	n/a	

Based on the t-test results, study abroad and undergraduate research are both statistically significant towards starting salary at a 0.1 level of significance. The "n/a" cells in the chart indicate that there were no outliers under the Accounting, Economics, and Finance majors category. Displayed below is the multivariable linear regression for the Accounting, Economics, and Finance group:

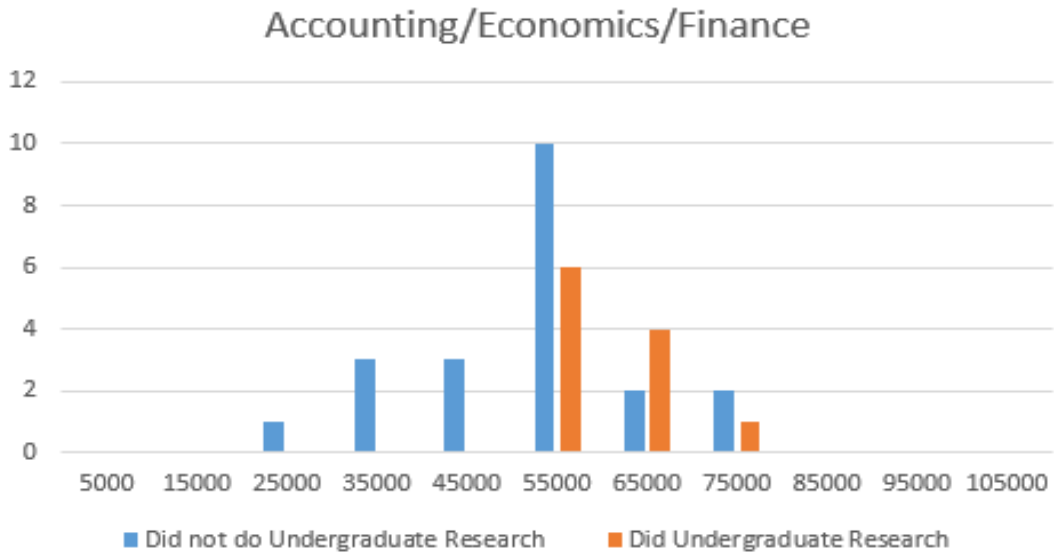
Starting salary = 104938 – 13625*GPA + 11981*Female – 11981*Internship + 11323*UndergraduateResearch

This multivariable regression equation displays the results from the regression process in Appendix B. The GPA coefficient in the above equation is negative, and we surmised that the individuals who had higher GPAs in this major category were more inclined to go to graduate school or to accept a job offer that paid less but in turn would allow them to study more for the CPA, CFA, etc exams. Therefore, these students likely chose the option that would earn them a higher salary in the future rather than immediately. In addition, the internship coefficient is negative, which could indicate that the individuals that participated in an internship sacrificed some of their time that could have been spent on school. This may have resulted in lower grades or less participation in academic extracurricular activities and ultimately a lower starting salary. In contrast, interestingly, the coefficient for females was positive. After looking at the histogram displayed below, it appears that there were more female respondents than males, and these females

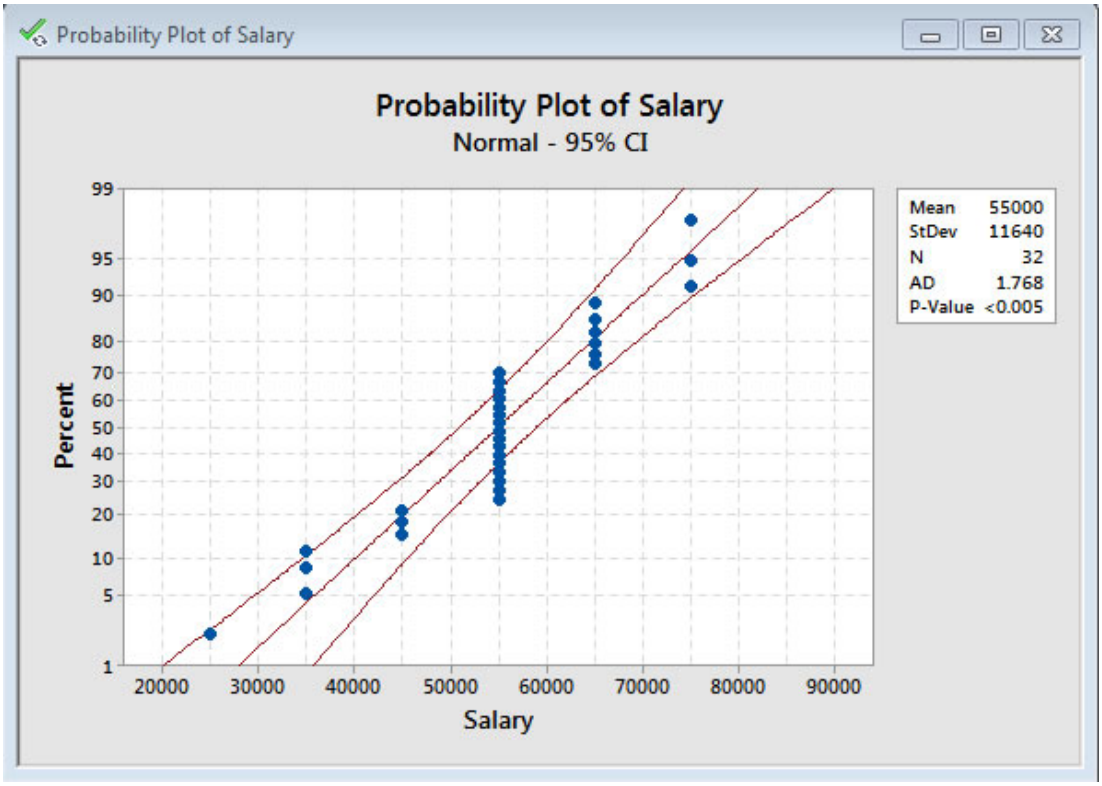
had a strong mean starting salary. The males, on the other hand, had a much more widespread range of starting salaries, and the overall mean turned out to be lower than that of the females.



Finally, the coefficient for undergraduate research was positive, which indicates that research proves to be important to employers of this field. This could be the case because undergraduate research strengthens students' understanding of a particular topic and encourages students to learn outside of the regular curriculum.



After comparing the results of the t-tests and multivariable linear regression, we can confidently conclude that undergraduate research is the most likely factor to influence a recent college graduate's starting salary. The QQ plots for the Accounting, Economics, Finance category is displayed below.



As shown in the QQ plot, the p-value of this data was less than the 0.05 level of significance, and thus, the data is not normally distributed for the Accounting, Economics, Finance category. This can be seen in the above picture since not all of the data points lie within the 95% confidence interval bands.

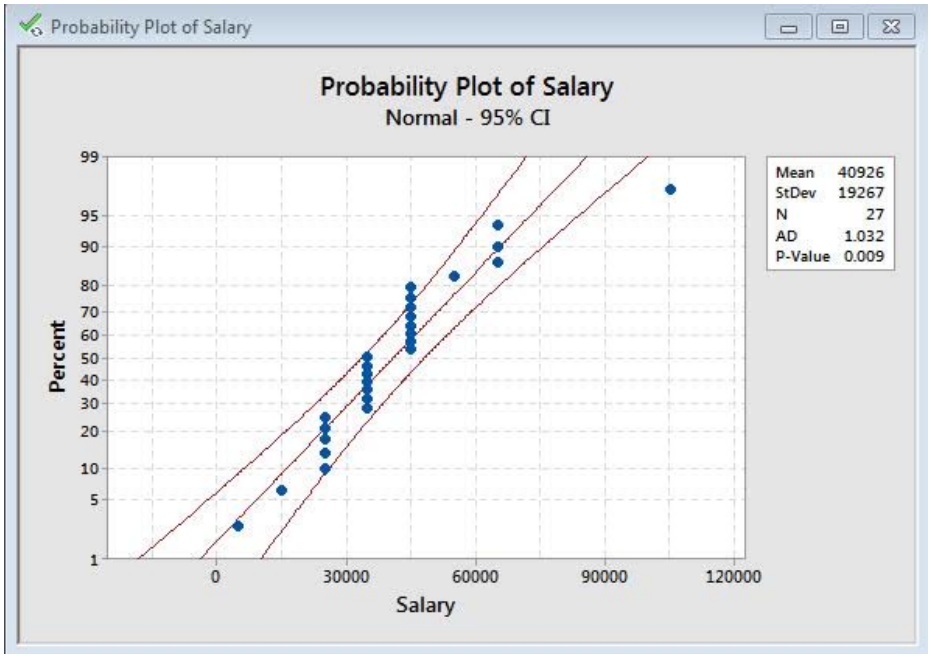
Other Business

Other Business			
Gender	0.722		No Difference
Internship	0.406	0.723	No Difference
Study Abroad	0.861	0.82	No Difference
Research	0.675	0.874	No Difference

Based on the t-test results shown above, appear to be no statistically significant factors affecting starting salary at a 0.1 level of significance, both when including outliers and when excluding them. Displayed below is the multivariable linear regression for the Other Business category:

Starting salary = 55000

This multivariable regression equation displays the results from the regression process in Appendix B. The absence of coefficients is due to the fact that the multivariable linear regression, like the t-test, showed that there were no relevant factors affecting starting salary. The QQ plot for the Other Business category is displayed below.



As shown in the QQ plot, the p-value of this data was less than the 0.05 level of significance, and thus, the data is not normally distributed for the Other Business category. Similar to the Accounting, Economics, and Finance category, this can be seen in the above picture since not all of the data points lie within the 95% confidence interval bands.

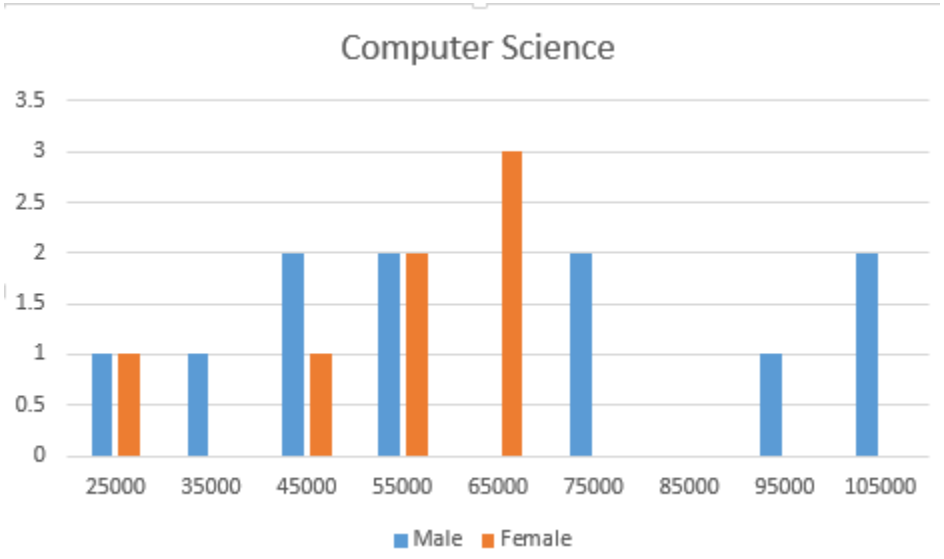
Computer Science

	p-value (original)	p-value (adjusted)	
Computer Science			
Gender	0.274	0.892	No Difference
Internship	0.01	0.429	Difference
Study Abroad	0.088	0.19	Difference
Research	0.333	0.335	No Difference

Based on the t-test results, internship and study abroad are both statistically significant towards starting salary at a 0.1 level of significance. However, when the t-test was performed again when excluding outliers, no factors seemed to affect starting salary. Displayed below is the multivariable linear regression for the Computer Science group:

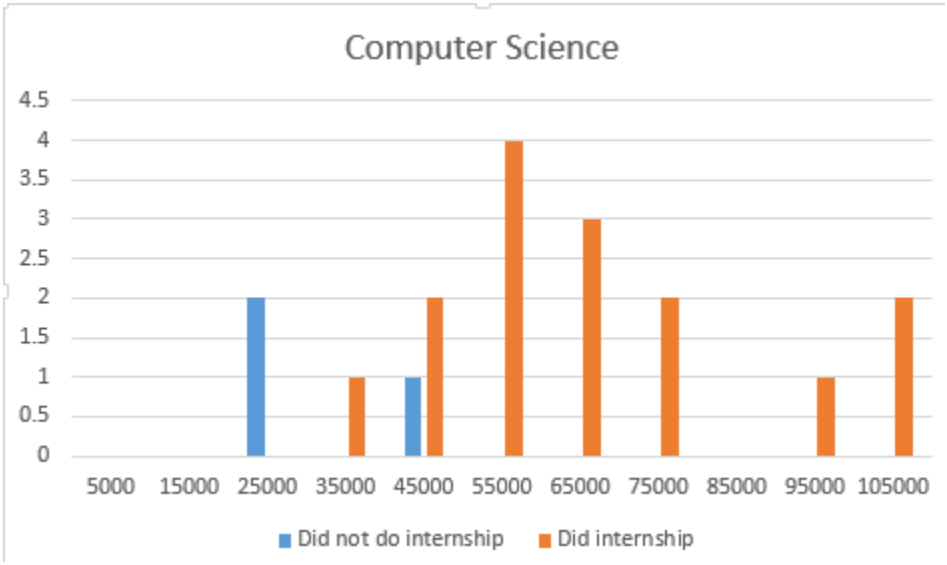
Starting salary = 37605 – 17815*Female + 28739*Internship + 21345*StudyAbroad

This multivariable regression equation displays the results from the regression process in Appendix B. The Female coefficient in the above equation is negative. After observing the histogram below, the male group contains members who made over $90,000 for their starting salaries, raising the overall average of the group. The female group does not have any of these members, keeping the overall average lower than that of the males. After removing the outliers, this difference between the means would shrink slightly.



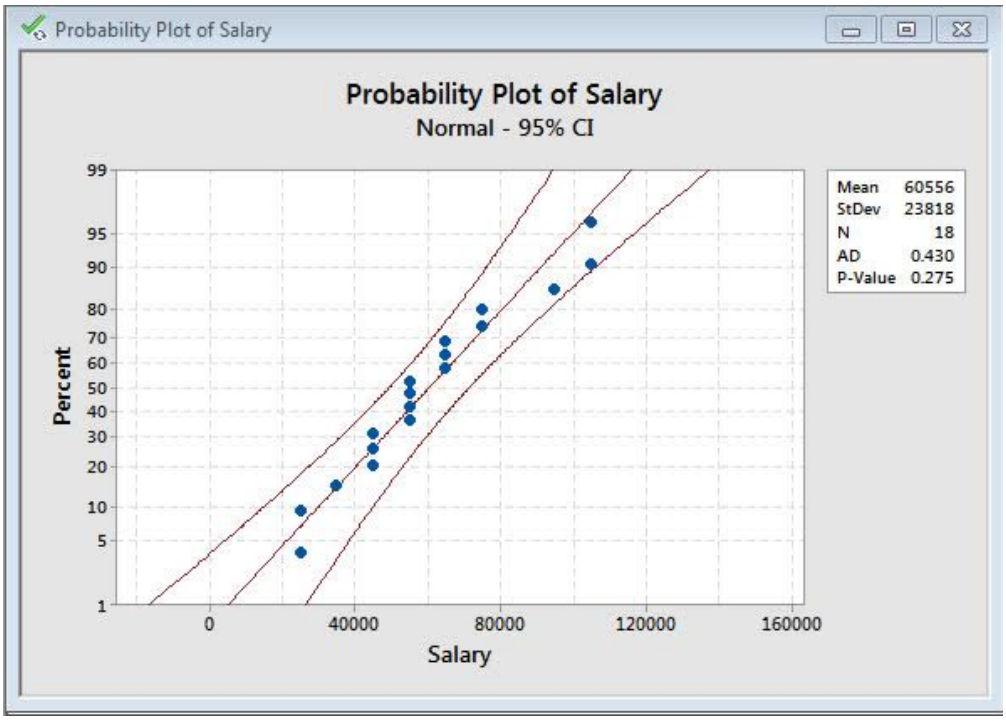
The coefficient for internship was positive. Based on the histogram below, note that a large portion of our sample partook in an internship. Those that did not partake in an internship

seemed to have lower incomes. A potential reasoning behind this could be that those who did not partake in an internship decided to go on to graduate school and are consequently not making as much money.



The study abroad coefficient for Computer Science majors is positive. This could indicate that employers of computer scientists value the culturally enriching experiences that come with studying abroad.

As shown in the QQ plot depicted below for Computer Science, the p-value of this data was greater than the 0.05 level of significance, and thus, the data is normally distributed for Computer Science majors. This normal trend can be seen in the graph below as all of the data points lie within the 95% confidence interval bands.



Engineering

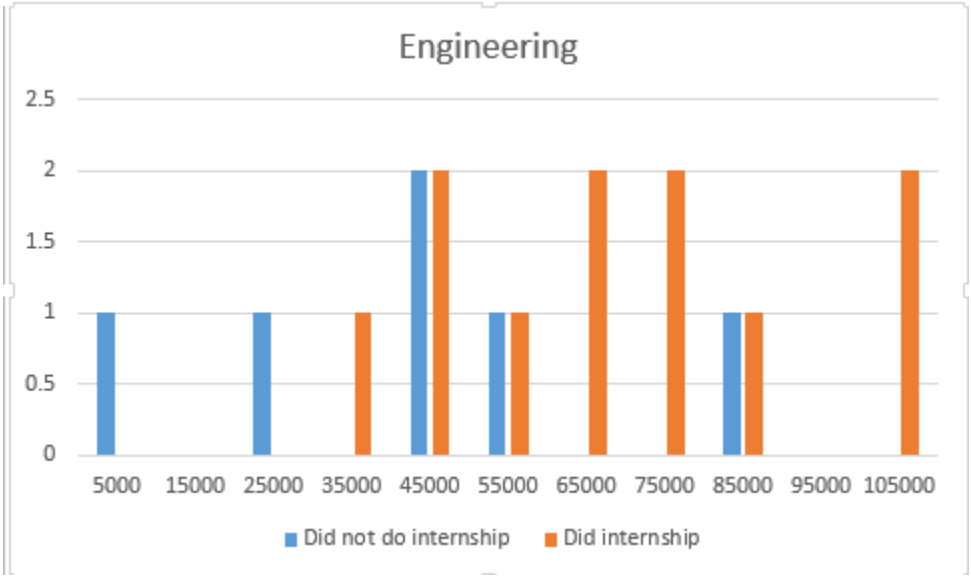
Engineering			
Gender	0.571	0.787	No Difference
Internship	0.086	0.036	No Difference
Study Abroad	0.023	0.1	No Difference
Research	0.266	0.486	No Difference

The t-test results shows that internship was significant at the 0.1 level before adjusting for outliers and also significant at the 0.05 level after adjusting for outliers. Study abroad was significant at the 0.05 level before adjusting for outliers and, after adjusting for outliers, had a p-value of 0.1.

Starting salary = 60000 + 11254*Internship – 25000*StudyAbroad

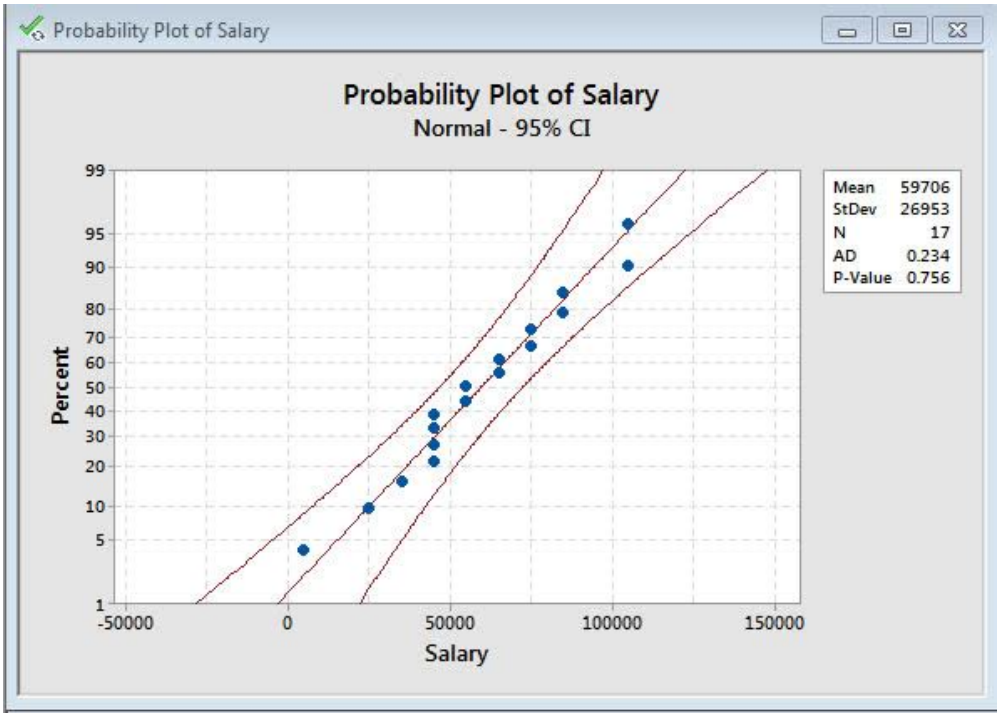
The equation above is a product of the regression results obtained from the process displayed in Appendix B.

The histogram below shows the distribution of those who partook in an internship and those who did not. It seems more likely to obtain a higher starting salary if the individual had interned for a company while an undergraduate student. We concluded that an internship appeals to employers more because internships typically help undergraduate students become more accustomed to a particular work environment. Partaking in an internship can also help undergraduates become more familiar with the main concepts behind their work and more specialized in the main tasks that they will perform while working, thus easing the training process for the job.



This research paper will focus more in detail about the negative study abroad component of the multivariable regression equation, particularly because our university (the University of San Diego) is known for having a large, thriving study abroad program. Refer to Section 8 for more analysis on the topic of Study Abroad for Engineering, Mathematics, and Science majors.

Displayed below is the QQ plot for Engineering majors.



As shown in the QQ plot, the p-value of this data was greater than the 0.05 level of significance, and thus, the data is normally distributed for the Engineering category. All of the data points lie within the 95% confidence interval bands as well, meaning that our sample group of engineers may be representative of a more general population.

Mathematics

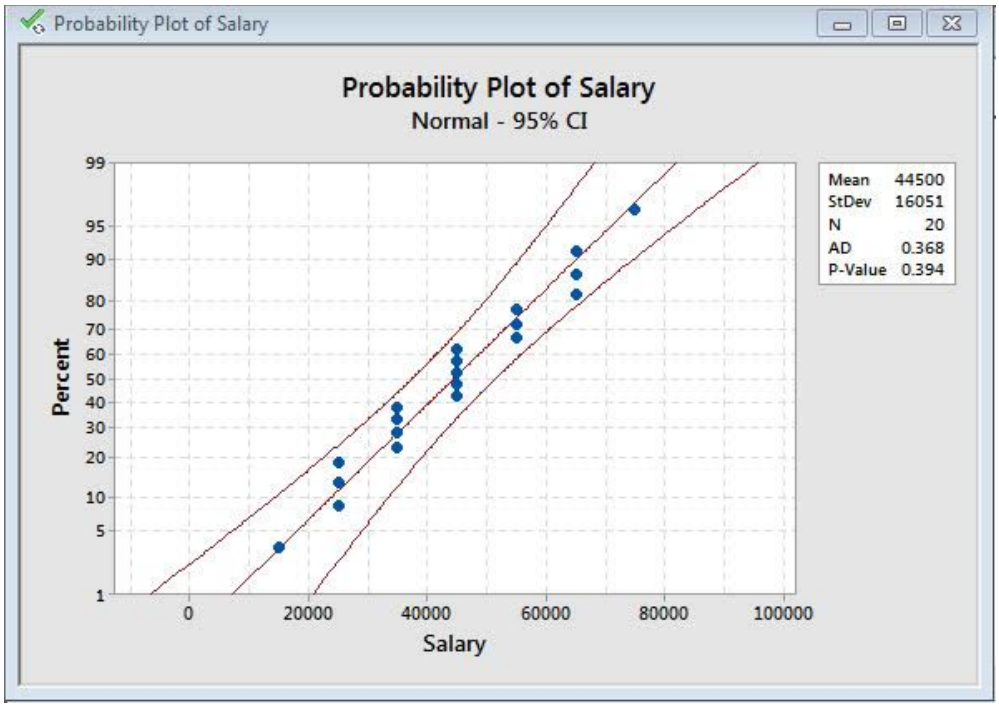
Mathematics			
Gender	0.546	n/a	n/a
Internship	0.691	n/a	n/a
Study Abroad	0.082	n/a	n/a
Research	0.688	n/a	n/a

Based on the t-test results, we can see that study abroad is significant at the 0.1 level. For the Mathematics category, there were no extraneous values in the data, which is why there are "n/a" values in the cells.

Starting salary = 51667 – 13030*StudyAbroad

Once again, this paper will go into more extensive discussion about the negative study abroad variable in this regression equation in Section 8..

Displayed below is the QQ plot for the Mathematics major category.



As shown in the QQ plot, the p-value of this data was less than the 0.05 level of significance, and thus, the data is not normally distributed for the Accounting, Economics, Finance category. This can be seen in the above picture since not all of the data points lie within the 95% confidence interval bands.

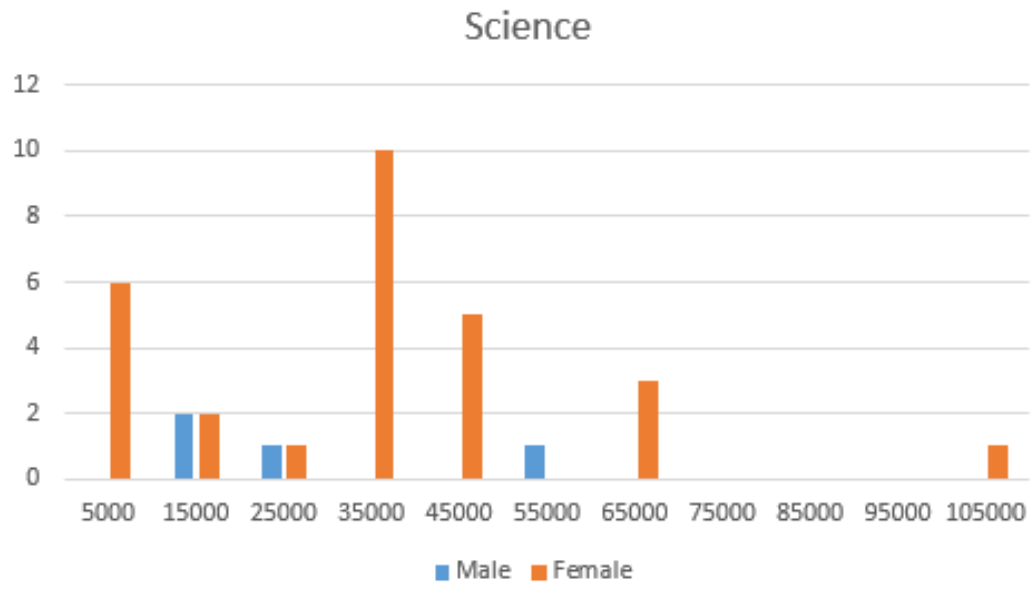
Science

	p-value (original)	p-value (adjusted)	
Science			
Gender	0.55	0.32	No Difference
Internship	0.117	0.321	No Difference
Study Abroad	0.025	0.092	No Difference
Research	0.616	0.918	No Difference

The t-test results indicate that study abroad was significant at the 0.05 level before adjusting for outliers and significant at the 0.1 level after adjusting for outliers. Below is the multiple linear regression equation for the Science major category.

Starting salary = 35571 +21036*Female – 14630*Internship – 17653*StudyAbroad

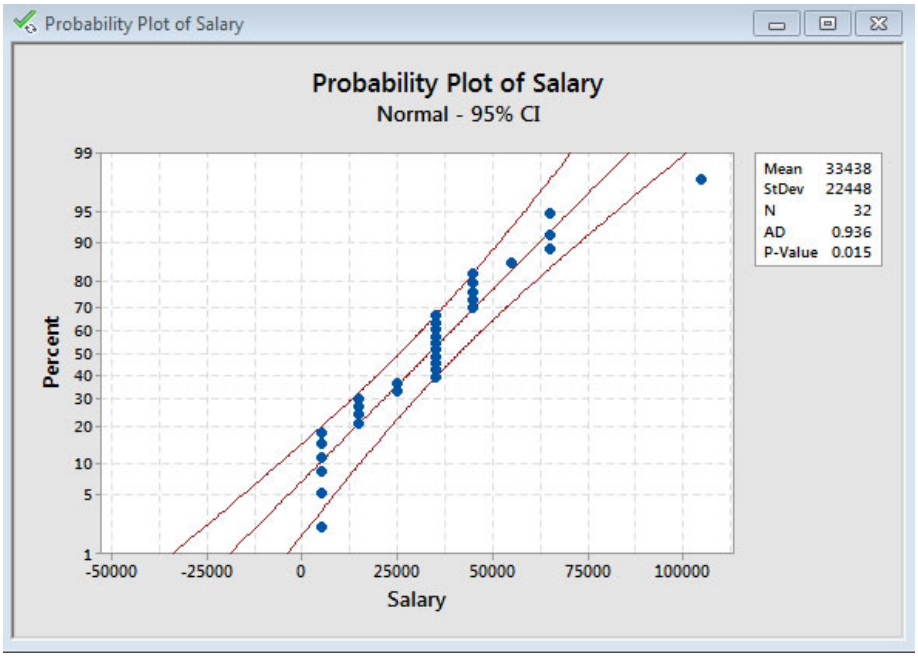
From the regression results obtained from the process illustrated in Appendix B, we obtained a positive coefficient for females. However, it is important to note that we had a much larger proportion of female respondents for this category. Our distribution for both male and female starting salaries are notably spread out. The salaries of females were particularly spread out, but this may be in large part due to the very small sample size of males.



According to the equation, internship has a negative impact on starting salary for science majors. This may be because having an internship is not as valuable to employers looking to hire science majors as undergraduate research or a strong GPA is and taking part in an internship may prevent the student from having the latter variables.

Once again, this paper will discuss the negative study abroad variable in this regression equation in Section 8.

Displayed below is the QQ plot for the Science majors.



As shown in the QQ plot above, since the p-value is less than 0.05, we can conclude that the data for Science Majors is not normally distributed as there are two data points that lie outside of the 95% confidence interval.

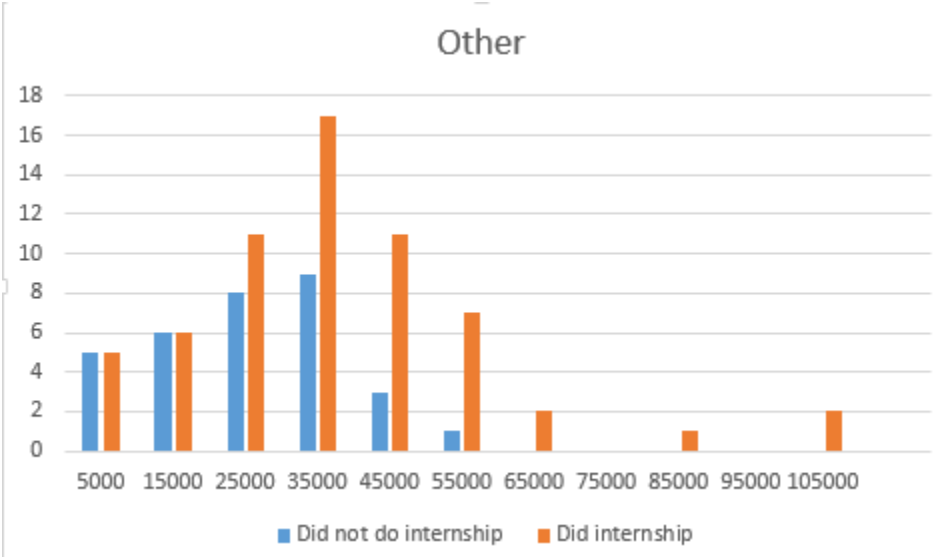
Other

Other			
Gender	0.675	0.41	No Difference
Internship	0.002	0.007	No Difference
Study Abroad	0.489	0.878	No Difference
Research	0.956	0.635	No Difference

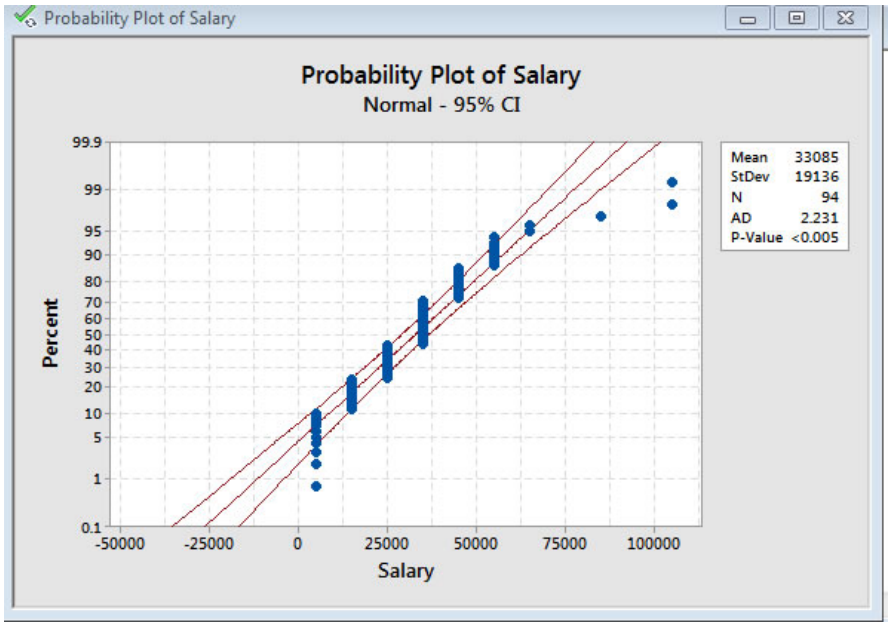
Based on the t-test results, internship is significant at the .05 level before and after adjusting for outliers indicating that internship is a very strong determinant of starting salary.

Starting salary = 25625 +11310*Internship

This positive coefficient for internship could indicate that having an internship is an imperative way for students to get an idea of what job field they should go into after graduation and to gain experience in said field. Partaking in an internship will give these "other" majors the skills that they need to succeed in the field post-graduation as well as an advantage over other candidates.



Displayed below is the QQ plot for the "Other" Major category.



As shown in the QQ plot above, since the p-value is less than 0.05, we can conclude that the data for Other Majors is not normally distributed. We can also see that there are clear outliers that lie outside of the 95% confidence interval band for starting salary.

8 A Closer Look: Study Abroad

We felt like the most interesting finding in our research was that studying abroad negatively impacted the starting salaries of Engineering, Mathematics, and Science majors, especially because the University of San Diego's study abroad program is so revered and popular. So, this finding doesn't seem logical to us. We considered other methods to verify the validity of these results and ultimately decided to try removing the outliers, conducting the t-tests again, and seeing if the results had changed. However, after completing this process for all three majors, the results did not change as was displayed in the Results section of this report.

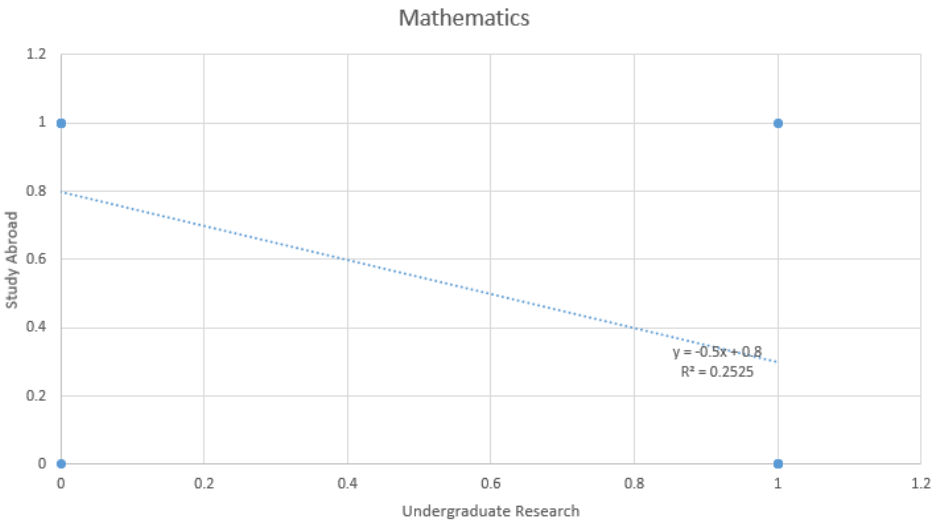
So, what does this mean for study abroad with regards to the Engineering, Math, and Science majors? Well, we will not make any stark conclusions due to the small sample size that we had in this study. We developed some possible explanations for our finding. Students who study abroad may have a stronger desire to travel the world and will sacrifice a higher starting salary to have more vacation time or opportunities to travel. Furthermore, students who study abroad may also be at a disadvantage when returning to their university because these individuals often do not take many or any classes related to their major. This may cause these students to initially have trouble in their major courses and to have difficulties transitioning back into a more academically rigorous environment. Ultimately, we would definitely be interested in exploring this potential relationship more in the future.

9 Chi-Square Test for Association

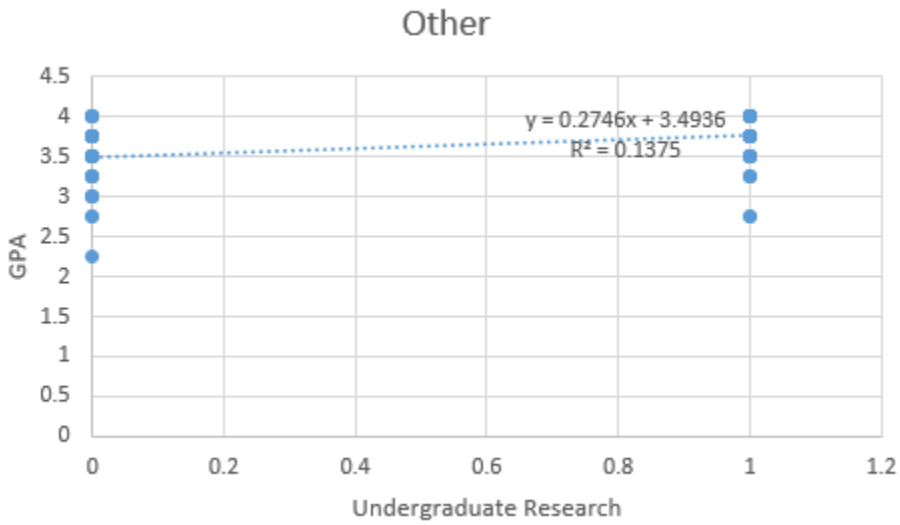
Chi-Square Test	
Accounting, Economics, Finance	
Internship and Undergraduate Research	Independent
Mathematics	
Study Abroad and Undergraduate Research	Associated
Other Business	
Math and Undergraduate Research	Independent
Other	
GPA and Undergraduate Research	Associated

The results from the chi-square test for association shows that in the accounting, economics, finance category, internship and undergraduate research are independent from one another, meaning that whether or not one partakes in an internship does not influence whether or not one partakes in undergraduate research. The same can be said about math and undergraduate research for the other business category. But, study abroad and undergraduate research are associated for the mathematics category, and GPA and undergraduate research are associated in the other category.

From this graph below, we can see that study abroad and undergraduate research are negatively correlated in the Mathematics department. Thus, someone who studies abroad is less likely to partake in undergraduate research. This may be because there are not many mathematics courses offered abroad, so those who study abroad have a bigger mathematics course load when they come back. Thus, they may not have the time to undertake an undergraduate research or their participation in a study abroad program prevented them from having a full year to conduct undergraduate research.



From the graph below, we can see that undergraduate research and GPA are positively correlated in the other category. Thus, we can conclude that someone with a higher GPA is more likely to undertake in undergraduate research. This may be because those with higher GPA are more ambitious and willing to do an undergraduate research.



10 Conclusion

After conducting extensive research, it appears as though there are few clear factors that influence a recent college graduate's starting salary. However, there are many potentially influential factors that were displayed in the multivariable linear regression models but not verified in the accompanying t-tests. These variables' influence on starting salary should be further explored. In addition, the topic of study abroad should be further explored in the future to determine if it really does have a negative impact on starting salaries of Engineering, Mathematics, and Science majors.

Displayed below is a general chart summarizing the results found in this research paper.

	Influential Factor 1	Influential Factor 2
Accounting, Economics, Finance	Undergraduate Research (+)	
Computer Science	Internship (+)	Study Abroad (+)
Engineering	Internship (+)	Study Abroad (-)
Mathematics	Study Abroad (-)	
Science	Study Abroad (-)	
Other Business		
Other	Internship (+)	

In hindsight, there are a few things that we wish we could have done differently. For example, if we were to conduct this research from the beginning once more, we would like to use smaller intervals for salaries below $25,000. The reasoning behind this change would be to get a better feel of how little money these individuals were actually making. We also would have liked to have observed other potential factors, such as involvement in Greek life, involvement in the Honors Program, or prior work experience on campus. Knowing these individuals' occupations would have been useful to make sure that no graduate students were accidentally taking the survey too. Finally, it would have been beneficial to have grouped the majors differently since some of the sample sizes for some of the categories were relatively small.

Overall, we are very thankful to have had the opportunity to conduct our research for the University of San Diego's Mathematics and Computer Science Department. This was a highly enriching experience, and we hope to conduct further research in the future on this topic.

11 Appendix

Appendix A: R Program

T-Test

Yes <- read.table ("yes.csv", fill = TRUE, header = TRUE)

No <- read.table("no.csv", fill = TRUE, header = TRUE)

****The yes and no are files with the salaries of those who partook in the variable and those who did not partake in the variable respectively. They were done on excel and then saved as a "csv" file.*

t.test(Yes, No, paired = TRUE)

Appendix B: Regression Process

Accounting, Economics, Finance									
		Constant	GPA	Math	Female	Internship	Undergraduate Research	Study Abroad	R squared
Regression 1:	Coefficient	100034	-12888	611	10176	-12066	9829	4792	49%
	P-value	0	0.034	0.589	0.014	0.035	0.022	0.201	
Regression 2:	Coefficient	104561	-13570		10542	-12794	10097	4576	48.39%
	P-value	0	0.021		0.009	0.021	0.017	0.221	
Regression 3:	Coefficient	104938	-13625		11981	-12049	11323		45.14%
	P-value	0	0.022		0.003	0.029	0.007		

Other Business									
		Constant	GPA	Math	Female	Internship	Undergraduate Research	Study Abroad	R squared
Regression 1:	Coefficient	16068	7486	6112	-1255	-16369	8201	-1513	21.37%
	P-Value	0.757	0.598	0.234	0.946	0.147	0.437	0.873	
Regression 2:	Coefficient	15263	7486	5936		-16228	8102	-1663	21.35%
	P-Value	0.757	0.588	0.169		0.134	0.427	0.853	
Regression 3:	Coefficient	14338	7611	5693		-16470	8649		21.22%
	P-Value	0.765	0.573	0.156		0.117	0.365		
Regression 4:	Coefficient	40388		5989		-16897	10540		20.05%
	P-Value	0.004		0.127		0.102	0.234		
Regression 5:	Coefficient	46355		4323		-16710			14.86%
	P-Value	0.001		0.237		0.109			
Regression 6:	Coefficient	55000		20		-16522			9.64%
	P-Value	0				0.115			

Engineering		Constant	GPA	Math	Female	Internship	Undergraduate Research	Study Abroad	R squared
Regression 1:	Coefficient	35139	5897	1231	-5243	21788	2525	-27960	44.35%
	P-value	0.749	0.761	0.944	0.749	0.289	0.885	0.093	
Regression 2:	Coefficient	41688	5615		-5133	21918	2710	-27711	44.32%
	P-value	0.451	0.756		0.741	0.261	0.868	0.073	
Regression 3:	Coefficient	41168	6347		-3972	19991		-27492	44.17%
	P-value	0.436	0.705		0.764	0.178		0.062	
Regression 4:	Coefficient	43689	5337			18397		-27221	43.74%
	P-value	0.386	0.735			0.165		0.054	
Regression 5:	Coefficient	60000				11254		-25000	43.22%
	P-value	0				0.097		0.036	
Computer Science		Constant	GPA	Math	Female	Internship	Undergraduate Research	Study Abroad	R squared
Regression 1:	Coefficient	20429	3297	-276	-15101	31879	16411	19266	61.97%
	P-value	0.7	0.78	0.964	0.141	0.027	0.15	0.12	
Regression 2:	Coefficient	19065	3393		-15050	31892	16380	19243	61.96%
	P-value	0.648	0.76		0.122	0.02	0.132	0.104	
Regression 3:	Coefficient	31313			-15578	31033	16639	20673	61.65%
	P-value	0.012			0.092	0.016	0.112	0.05	
Regression 4:	Coefficient	37605			-17815	28739		21345	53.05%
	P-value	0.004			0.069	0.029		0.055	
Math									
		Constant	GPA		Female	Internship	Undergraduate Research	Study Abroad	R squared
Regression 1:	Coefficient	88931	-8475		8624	5240	-16327	-21130	36.73%
	P-Value	0.069	0.503		0.268	0.509	0.072	0.023	
Regression 2:	Coefficient	84112	-6685		7603		-14308	-21246	34.66%
	P-Value	0.074	0.58		0.307		0.083	0.019	
Regression 3:	Coefficient	59815			6296		-14074	-19630	33.27%
	P-Value	0			0.359		0.08	0.018	
Regression 4:	Coefficient	61568					-12730	-19459	29.54%
	P-Value	0				25	0.102	0.018	
Regression 5:	Coefficient	51667						-13030	17.17%
	P-Value	0						0.069	

Science									
		Constant	GPA	Math	Female	Internship	Undergraduate Research	Study Abroad	R squared
Regression 1:	Coefficient	104266	-23723	1577	25681	-13203	9838	-14526	38.92%
	P-Value	0.043	0.118	0.514	0.042	0.135	0.459	0.087	
Regression 2:	Coefficient	109095	-24117		25157	-13836	10977	-13863	37.85%
	P-Value	0.031	0.108		0.043	0.112	0.4	0.095	
Regression 3:	Coefficient	102977	-19832		26333	-14155		-15064	36.11%
	P-Value	0.037	0.154		0.033	0.102		0.065	
Regression 4:	Coefficient	35571			21036	-14630		-17653	31.01%
	P-Value	0.001			0.074	0.097		0.031	
Other									
		Constant	GPA	Math	Female	Internship	Undergraduate Research	Study Abroad	R squared
Regression 1:	Coefficient	8024	5182	-750	485	10707	-1871	1443	9.27%
	P-Value	0.714	0.41	0.669	0.939	0.013	0.664	0.732	
Regression 2:	Coefficient	8450	5153	-728		10744	-1852	1447	9.27%
	P-Value	0.688	0.408	0.668		0.011	0.665	0.73	
Regression 3:	Coefficient	6476	5902	-668		10678	-1929		9.14%
	P-Value	0.748	0.31	0.69		0.011	0.65		
Regression 4:	Coefficient	6163	5800			10577	-2133		8.98%
	P-Value	0.759	0.315			0.012	0.612		
Regression 5:	Coefficient	8833	4714			10655			8.72%
	P-Value	0.647	0.377			0.011			
Regression 6:	Coefficient	25625				10310			7.93%
	P-Value	0				0.006			

Appendix C: Survey Responses

What is your gender?	What was your college major?	What was your college minor?	What is the highest level of math course that you took in college?	Did you have an internship during your undergraduate career?	Did you do any undergraduate research?	Did you study abroad ?	What was your cumulative college GPA?	What was your starting salary in your first post-graduation job?
Female	Arts (Architecture, Art History, Visual Arts, etc.)	Art (Architecture, Art History, Visual Arts, etc.)	College Algebra	Yes	Yes	No	3.75-4.0	Less than $10,000
Female	Other Business	Social Sciences	Survey of Calculus/Calculus I	Yes	Yes	No	3.25-3.5	$30,000-$40,000
Female	Arts (Architecture, Art History, Visual Arts, etc.)	Other Business	College Algebra	Yes	No	No	3.5-3.75	$40,000-$50,000
Female	Other	Other	College Algebra	No	Yes	No	3.5-3.75	Less than $10,000
Female	Psychology	Other Business	None	No	No	No	3.25-3.5	$10,000-$20,000
Female	Psychology	Art (Architecture, Art History, Visual Arts, etc.)	College Algebra	No	No	No	3.5-3.75	Less than $10,000
Female	Social Sciences	Art (Architecture, Art History, Visual Arts, etc.)	College Algebra	No	No	No	3.0-3.25	$20,000-$30,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	Yes	Yes	Yes	3.25-3.5	$30,000-$40,000
Female	Psychology	Psychology	College Algebra	Yes	Yes	No	3.5-3.75	$30,000-$40,000
Male	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Other	Calculus III	No	Yes	No	3.25-3.5	$20,000-$30,000
Female	Accounting, Economics, Finance	Language (English, Spanish, French, Italian, German)	None	Yes	No	Yes	3.75-4.0	$50,000-$60,000
Female	Social Sciences	Other Business	Calculus II	No	No	Yes	3.5-3.75	$30,000-$40,000
Male	Arts (Architecture, Art	Social Sciences	None	No	No	Yes	3.5-3.75	$30,000-$40,000

	History, Visual Arts, etc.)							
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Language (English, Spanish, French, Italian, German)	Calculus III	Yes	No	Yes	3.5-3.75	$10,000-$20,000
Female	Mathematics	Accounting, Economics, Finance	Above Calculus III (math major or minor)	No	Yes	No	3.25-3.5	$60,000-$70,000
Male	Social Sciences	Other	None	Yes	No	No	3.25-3.5	$50,000-$60,000
Female	Other Business	Other	Calculus III	Yes	No	No	3.25-3.5	$40,000-$50,000
Female	Other	Other	None	No	No	No	2.75-3.0	$10,000-$20,000
Female	Computer Science	Language (English, Spanish, French, Italian, German)	Calculus II	Yes	No	Yes	3.25-3.5	$60,000-$70,000
Female	Accounting, Economics, Finance	Other	Above Calculus III (math major or minor)	Yes	Yes	Yes	3.75-4.0	$60,000-$70,000
Female	Communications	Other Business	None	Yes	No	Yes	3.25-3.5	$40,000-$50,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Other	Calculus II	Yes	Yes	No	3.25-3.5	$40,000-$50,000
Female	Communications	Language (English, Spanish, French, Italian, German)	College Algebra	No	No	Yes	3.25-3.5	$30,000-$40,000
Female	Accounting, Economics, Finance	Other	Calculus II	Yes	No	No	3.0-3.25	$50,000-$60,000
Male	Other Business	Other Business	None	Yes	No	No	3.0-3.25	$50,000-$60,000
Female	Accounting, Economics, Finance	Mathematics	Above Calculus III (math major or minor)	Yes	No	Yes	3.5-3.75	$50,000-$60,000
Female	Social Sciences	Other	None	Yes	Yes	No	3.5-3.75	$50,000-$60,000
Female	Engineering	Mathematics	Above Calculus III (math major or minor)	Yes	No	Yes	3.25-3.5	$60,000-$70,000
Female	Other	Other	College Algebra	Yes	Yes	No	3.5-3.75	$50,000-$60,000

Female	Other	Other	College Algebra	Yes	Yes	No	3.5-3.75	$20,000-$30,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	No	Yes	No	3.5-3.75	$60,000-$70,000
Male	Engineering	Mathematics	Above Calculus III (math major or minor)	Yes	No	No	2.75-3.0	$50,000-$60,000
Female	Other	Other	College Algebra	Yes	No	No	3.5-3.75	$30,000-$40,000
Male	Other	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	Yes	No	No	3.5-3.75	$30,000-$40,000
Female	Psychology	Other	College Algebra	No	Yes	No	3.0-3.25	$20,000-$30,000
Female	Other	None	None	No	No	Yes	3.5-3.75	$30,000-$40,000
Female	Computer Science	Language (English, Spanish, French, Italian, German)	Calculus II	Yes	No	Yes	3.75-4.0	$50,000-$60,000
Female	Engineering	None	Above Calculus III (math major or minor)	Yes	No	No	2.75-3.0	$40,000-$50,000
Male	Engineering	None	Above Calculus III (math major or minor)	Yes	No	Yes	2.75-3.0	$60,000-$70,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Language (English, Spanish, French, Italian, German)	Calculus II	Yes	Yes	Yes	3.5-3.75	$30,000-$40,000
Female	Psychology	Other	Calculus II	Yes	No	Yes	3.25-3.5	$20,000-$30,000
Male	Engineering	None	Above Calculus III (math major or minor)	No	Yes	Yes	3.25-3.5	$20,000-$30,000
Female	Accounting, Economics, Finance	Accounting, Economics, Finance	Survey of Calculus/Calculus I	Yes	No	Yes	3.5-3.75	$30,000-$40,000
Female	Social Sciences	Other Business	College Algebra	Yes	No	No	3.5-3.75	$20,000-$30,000
Female	Engineering	None	Above Calculus III	Yes	Yes	No	3.75-4.0	More than $100,000

			(math major or minor)					
Male	Accounting, Economics, Finance	None	Calculus II	Yes	No	No	3.0-3.25	$40,000-$50,000
Female	Other Business	Language (English, Spanish, French, Italian, German)	Calculus II	Yes	No	Yes	3.0-3.25	$20,000-$30,000
Female	Other Business	None	College Algebra	Yes	No	No	3.25-3.5	$10,000-$20,000
Female	Social Sciences	Psychology	College Algebra	Yes	Yes	No	3.5-3.75	$20,000-$30,000
Female	Accounting, Economics, Finance	None	Calculus II	Yes	No	No	3.75-4.0	$50,000-$60,000
Female	Psychology	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus II	Yes	Yes	Yes	3.75-4.0	$30,000-$40,000
Female	Other	None	College Algebra	No	No	No	3.5-3.75	$40,000-$50,000
Female	Communications	None	None	Yes	No	No	3.75-4.0	$30,000-$40,000
Female	Other	None	Calculus III	Yes	No	No	2.75-3.0	$30,000-$40,000
Female	Engineering	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus III	Yes	Yes	No	3.0-3.25	$70,000-$80,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Other	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.5-3.75	$30,000-$40,000
Female	Other	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	Yes	No	Yes	3.25-3.5	$30,000-$40,000
Female	Accounting, Economics, Finance	None	Calculus II	Yes	Yes	No	3.75-4.0	$50,000-$60,000
Female	Other Business	None	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.0-3.25	$30,000-$40,000
Female	Psychology	None	None	No	Yes	No	3.25-3.5	$10,000-$20,000
Female	Other	Other	Calculus II	Yes	Yes	No	3.75-4.0	$60,000-$70,000
Male	Computer Science	None	Calculus III	Yes	No	Yes	3.25-3.5	$90,000-$100,000

Female	Arts (Architecture, Art History, Visual Arts, etc.)	Art (Architecture, Art History, Visual Arts, etc.)	Survey of Calculus/Calculus I	Yes	No	Yes	3.25-3.5	$10,000-$20,000
Female	Other	None	Survey of Calculus/Calculus I	No	Yes	No	3.25-3.5	$30,000-$40,000
Female	Communications	Other Business	Calculus III	Yes	Yes	No	3.75-4.0	$40,000-$50,000
Female	Other Business	Social Sciences	Survey of Calculus/Calculus I	Yes	No	Yes	2.75-3.0	$20,000-$30,000
Female	Psychology	None	None	No	No	No	2.5-2.75	$50,000-$60,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus II	Yes	Yes	No	3.25-3.5	$40,000-$50,000
Female	Accounting, Economics, Finance	Accounting, Economics, Finance	Survey of Calculus/Calculus I	Yes	No	No	3.0-3.25	$50,000-$60,000
Female	Social Sciences	Language (English, Spanish, French, Italian, German)	None	Yes	No	No	2.5-2.75	$30,000-$40,000
Female	Accounting, Economics, Finance	None	Above Calculus III (math major or minor)	Yes	No	No	3.75-4.0	$50,000-$60,000
Female	Other Business	Psychology	Calculus II	Yes	No	Yes	3.5-3.75	$40,000-$50,000
Female	Other	Art (Architecture, Art History, Visual Arts, etc.)	College Algebra	Yes	No	Yes	3.25-3.5	Less than $10,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.5-3.75	$60,000-$70,000
Male	Engineering	None	Above Calculus III (math major or minor)	Yes	No	No	3.5-3.75	More than $100,000
Female	Other Business	Psychology	Survey of Calculus/Calculus I	No	No	Yes	2.75-3.0	$30,000-$40,000
Female	Other Business	Other	Survey of Calculus/Calculus I	Yes	No	Yes	3.5-3.75	$30,000-$40,000
Female	Engineering	None	Above Calculus III	Yes	No	No	3.25-3.5	$80,000-$90,000

			(math major or minor)					
Male	Accounting, Economics, Finance	Other Business	Survey of Calculus/Calculus I	Yes	No	Yes	3.25-3.5	$50,000-$60,000
Female	Accounting, Economics, Finance	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus III	Yes	No	No	3.25-3.5	$50,000-$60,000
Female	Social Sciences	None	None	No	No	Yes	3.0-3.25	$20,000-$30,000
Female	Psychology	Other	Survey of Calculus/Calculus I	Yes	Yes	No	3.75-4.0	$10,000-$20,000
Female	Mathematics	Language (English, Spanish, French, Italian, German)	Above Calculus III (math major or minor)	No	No	Yes	3.25-3.5	$40,000-$50,000
Female	Arts (Architecture, Art History, Visual Arts, etc.)	Psychology	College Algebra	No	No	No	3.0-3.25	$20,000-$30,000
Male	Accounting, Economics, Finance	None	Calculus II	No	No	No	3.0-3.25	$70,000-$80,000
Female	Arts (Architecture, Art History, Visual Arts, etc.)	None	Survey of Calculus/Calculus I	Yes	No	No	3.0-3.25	$50,000-$60,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Language (English, Spanish, French, Italian, German)	Calculus II	No	Yes	No	3.25-3.5	$60,000-$70,000
Female	Social Sciences	Social Sciences	College Algebra	No	Yes	No	2.5-2.75	$10,000-$20,000
Male	Engineering	None	Above Calculus III (math major or minor)	No	Yes	Yes	3.25-3.5	$40,000-$50,000
Female	Communications	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Survey of Calculus/Calculus I	Yes	No	Yes	3.0-3.25	$40,000-$50,000
Female	Arts (Architecture, Art History, Visual Arts, etc.)	Other Business	Survey of Calculus/Calculus I	Yes	Yes	No	3.25-3.5	$50,000-$60,000
Female	Other Business	None	Survey of Calculus/Calculus I	Yes	Yes	No	3.25-3.5	$60,000-$70,000

Female	Social Sciences	Other Business	Calculus II	No	No	Yes	3.5-3.75	$30,000-$40,000
Male	Engineering	Mathematics	Calculus III	Yes	No	Yes	3.75-4.0	$70,000-$80,000
Female	Other Business	Communications	Survey of Calculus/Calculus I	Yes	No	Yes	2.75-3.0	$30,000-$40,000
Female	Communications	None	College Algebra	Yes	Yes	No	3.25-3.5	$20,000-$30,000
Female	Other Business	Other Business	Survey of Calculus/Calculus I	Yes	No	Yes	3.25-3.5	$40,000-$50,000
Male	Computer Science	Art (Architecture, Art History, Visual Arts, etc.)	Calculus II	Yes	Yes	No	3.5-3.75	More than $100,000
Female	Other Business	Accounting, Economics, Finance	Survey of Calculus/Calculus I	Yes	No	Yes	3.0-3.25	$40,000-$50,000
Female	Arts (Architecture, Art History, Visual Arts, etc.)	Art (Architecture, Art History, Visual Arts, etc.)	None	Yes	Yes	Yes	3.0-3.25	$20,000-$30,000
Male	Computer Science	None	Calculus II	Yes	No	No	3.0-3.25	$50,000-$60,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Other	Calculus II	Yes	Yes	No	3.25-3.5	$40,000-$50,000
Male	Engineering	None	Calculus III	No	No	No	3.0-3.25	$40,000-$50,000
Female	Arts (Architecture, Art History, Visual Arts, etc.)	Art (Architecture, Art History, Visual Arts, etc.)	College Algebra	Yes	No	No	2.75-3.0	$20,000-$30,000
Female	Psychology	None	None	Yes	Yes	No	3.5-3.75	$30,000-$40,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Language (English, Spanish, French, Italian, German)	Calculus II	Yes	Yes	Yes	3.5-3.75	$30,000-$40,000
Female	Communications	Other Business	College Algebra	Yes	No	No	2.75-3.0	$50,000-$60,000
Female	Other Business	Psychology	Calculus III	Yes	No	Yes	3.25-3.5	$60,000-$70,000
Female	Other	None	College Algebra	Yes	No	No	3.5-3.75	$40,000-$50,000
Male	Mathematics	Accounting, Economics, Finance	Above Calculus III (math major or minor)	No	Yes	No	3.0-3.25	$40,000-$50,000

Female	Social Sciences	Language (English, Spanish, French, Italian, German)	None	Yes	No	Yes	3.75-4.0	$40,000-$50,000
Female	Accounting, Economics, Finance	Mathematics	Above Calculus III (math major or minor)	Yes	No	Yes	3.0-3.25	$60,000-$70,000
Female	Communications	Other Business	Survey of Calculus/Calculus I	Yes	No	Yes	3.5-3.75	$40,000-$50,000
Female	Accounting, Economics, Finance	Computer Science	Survey of Calculus/Calculus I	Yes	No	Yes	2.75-3.0	$70,000-$80,000
Male	Engineering	None	Above Calculus III (math major or minor)	No	Yes	No	2.25-2.5	$80,000-$90,000
Male	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	Survey of Calculus/Calculus I	No	Yes	Yes	3.5-3.75	$10,000-$20,000
Female	Communications	None	College Algebra	Yes	Yes	No	2.5-2.75	Less than $10,000
Male	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	Survey of Calculus/Calculus I	No	No	No	2.25-2.5	$50,000-$60,000
Female	Other Business	Other	Survey of Calculus/Calculus I	Yes	No	Yes	3.25-3.5	$40,000-$50,000
Male	Accounting, Economics, Finance	Social Sciences	Survey of Calculus/Calculus I	Yes	No	No	3.5-3.75	$20,000-$30,000
Male	Social Sciences	Computer Science	Calculus II	Yes	No	No	3.25-3.5	$30,000-$40,000
Female	Computer Science	Mathematics	Above Calculus III (math major or minor)	Yes	No	No	3.0-3.25	$50,000-$60,000
Male	Mathematics	Other Business	Above Calculus III (math major or minor)	Yes	No	Yes	3.75-4.0	$50,000-$60,000
Female	Computer Science	Mathematics	Calculus III	Yes	Yes	Yes	3.25-3.5	$60,000-$70,000
Male	Computer Science	None	Above Calculus III (math major or minor)	No	Yes	No	3.5-3.75	$40,000-$50,000
Male	Computer Science	None	Calculus II	No	No	No	3.25-3.5	$20,000-$30,000

Male	Computer Science	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus II	Yes	No	No	3.0-3.25	$40,000-$50,000
Male	Mathematics	Mathematics	Above Calculus III (math major or minor)	No	No	No	3.25-3.5	$50,000-$60,000
Female	Other Business	Communications	Survey of Calculus/Calculus I	Yes	No	Yes	3.25-3.5	$40,000-$50,000
Male	Mathematics	Computer Science	Above Calculus III (math major or minor)	Yes	Yes	No	3.75-4.0	$20,000-$30,000
Male	Mathematics	Accounting, Economics, Finance	Above Calculus III (math major or minor)	No	No	Yes	3.0-3.25	$50,000-$60,000
Male	Mathematics	Other	Above Calculus III (math major or minor)	No	Yes	Yes	3.0-3.25	$30,000-$40,000
Male	Mathematics	Language (English, Spanish, French, Italian, German)	Above Calculus III (math major or minor)	No	No	Yes	3.0-3.25	$40,000-$50,000
Female	Computer Science	Language (English, Spanish, French, Italian, German)	Calculus III	Yes	No	No	2.0-2.25	$40,000-$50,000
Male	Computer Science	Other Business	Calculus III	Yes	No	No	2.75-3.0	$70,000-$80,000
Male	Mathematics	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Above Calculus III (math major or minor)	Yes	Yes	No	3.5-3.75	$60,000-$70,000
Female	Mathematics	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Above Calculus III (math major or minor)	No	No	No	3.75-4.0	$70,000-$80,000
Female	Other	Other	Calculus II	No	Yes	No	3.25-3.5	$40,000-$50,000
Female	Mathematics	Other	Above Calculus III (math major or minor)	Yes	Yes	No	3.5-3.75	$30,000-$40,000
Female	Mathematics	None	Above Calculus III	Yes	Yes	No	3.75-4.0	$60,000-$70,000

			(math major or minor)					
Male	Mathematics	Other	Above Calculus III (math major or minor)	Yes	Yes	No	3.25-3.5	$30,000-$40,000
Female	Mathematics	Computer Science	Above Calculus III (math major or minor)	Yes	Yes	Yes	3.25-3.5	$40,000-$50,000
Male	Other	None	College Algebra	No	No	No	2.0-2.25	Less than $10,000
Female	Computer Science	Other Business	Calculus II	Yes	No	No	3.75-4.0	$60,000-$70,000
Male	Computer Science	Mathematics	Above Calculus III (math major or minor)	Yes	No	No	3.0-3.25	$50,000-$60,000
Female	Mathematics	Accounting, Economics, Finance	Above Calculus III (math major or minor)	No	Yes	Yes	3.5-3.75	$10,000-$20,000
Female	Computer Science	Other Business	Calculus II	No	No	No	3.25-3.5	$20,000-$30,000
Male	Mathematics	None	Above Calculus III (math major or minor)	No	No	Yes	3.25-3.5	$20,000-$30,000
Male	Mathematics	Social Sciences	Above Calculus III (math major or minor)	Yes	No	Yes	2.5-2.75	$40,000-$50,000
Male	Computer Science	None	Calculus III	Yes	No	Yes	3.75-4.0	More than $100,000
Female	Mathematics	Art (Architecture, Art History, Visual Arts, etc.)	Above Calculus III (math major or minor)	No	No	Yes	3.25-3.5	$30,000-$40,000
Male	Computer Science	Other Business	Calculus III	Yes	No	No	3.75-4.0	$30,000-$40,000
Female	Other	None	None	Yes	Yes	Yes	3.5-3.75	$30,000-$40,000
Male	Accounting, Economics, Finance	Mathematics	Above Calculus III (math major or minor)	No	Yes	No	3.75-4.0	$50,000-$60,000
Female	Psychology	Language (English, Spanish, French, Italian, German)	Calculus II	Yes	Yes	Yes	3.5-3.75	$30,000-$40,000

Female	Social Sciences	Communications	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.75-4.0	$50,000-$60,000
Female	Social Sciences	Religious Studies	None	Yes	No	Yes	3.5-3.75	$30,000-$40,000
Female	Social Sciences	Language (English, Spanish, French, Italian, German)	Above Calculus III (math major or minor)	Yes	Yes	Yes	3.5-3.75	$10,000-$20,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus II	Yes	Yes	Yes	3.5-3.75	$40,000-$50,000
Female	Psychology	Other	College Algebra	Yes	Yes	Yes	3.5-3.75	$30,000-$40,000
Male	Mathematics	Art (Architecture, Art History, Visual Arts, etc.)	Above Calculus III (math major or minor)	No	No	Yes	3.5-3.75	$20,000-$30,000
Female	Other	Other	None	No	Yes	Yes	3.75-4.0	$20,000-$30,000
Female	Language (English, Spanish, French, Italian, etc.)	None	Survey of Calculus/Calculus I	No	Yes	Yes	3.75-4.0	$30,000-$40,000
Female	Other Business	Other	Survey of Calculus/Calculus I	No	Yes	No	3.75-4.0	More than $100,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Mathematics	Above Calculus III (math major or minor)	Yes	Yes	Yes	3.75-4.0	$30,000-$40,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Psychology	Calculus II	Yes	Yes	Yes	3.25-3.5	$10,000-$20,000
Female	Communications	Other Business	None	Yes	Yes	Yes	3.75-4.0	$60,000-$70,000
Female	Social Sciences	None	College Algebra	Yes	Yes	Yes	3.75-4.0	$20,000-$30,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	Yes	No	Yes	3.75-4.0	Less than $10,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	None	Yes	Yes	No	3.5-3.75	Less than $10,000
Female	Accounting, Economics, Finance	Accounting, Economics, Finance	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.75-4.0	$50,000-$60,000

Male	Language (English, Spanish, French, Italian, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Survey of Calculus/Calculus I	No	Yes	Yes	3.75-4.0	$20,000-$30,000
Female	Social Sciences	None	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.5-3.75	Less than $10,000
Female	Other	None	Calculus III	No	Yes	Yes	3.5-3.75	$20,000-$30,000
Female	Other	Language (English, Spanish, French, Italian, German)	Calculus II	Yes	Yes	Yes	3.75-4.0	$40,000-$50,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Mathematics	Above Calculus III (math major or minor)	Yes	Yes	Yes	3.5-3.75	Less than $10,000
Male	Engineering	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Above Calculus III (math major or minor)	No	Yes	Yes	3.5-3.75	Less than $10,000
Female	Accounting, Economics, Finance	None	Survey of Calculus/Calculus I	Yes	No	Yes	3.75-4.0	$50,000-$60,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	Calculus II	No	Yes	Yes	3.5-3.75	Less than $10,000
Female	Other Business	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	Yes	No	Yes	3.5-3.75	$30,000-$40,000
Male	Language (English, Spanish, French, Italian, etc.)	None	Survey of Calculus/Calculus I	No	Yes	No	3.75-4.0	$30,000-$40,000
Female	Social Sciences	Other Business	None	Yes	Yes	Yes	3.75-4.0	More than $100,000
Female	Other Business	Communications	None	Yes	Yes	No	3.75-4.0	$20,000-$30,000
Male	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus II	Yes	Yes	No	3.75-4.0	$10,000-$20,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	Yes	Yes	No	3.75-4.0	$30,000-$40,000

Female	Other	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.25-3.5	Less than $10,000
Female	Other	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus II	Yes	Yes	Yes	3.5-3.75	More than $100,000
Female	Other	Other	College Algebra	Yes	Yes	Yes	3.75-4.0	$20,000-$30,000
Male	Social Sciences	Other Business	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.25-3.5	$40,000-$50,000
Female	Social Sciences	None	College Algebra	Yes	Yes	No	3.75-4.0	$30,000-$40,000
Female	Communications	Language (English, Spanish, French, Italian, German)	College Algebra	Yes	No	Yes	3.75-4.0	$30,000-$40,000
Female	Social Sciences	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	No	Yes	Yes	3.75-4.0	$10,000-$20,000
Male	Arts (Architecture, Art History, Visual Arts, etc.)	None	None	No	Yes	Yes	3.75-4.0	Less than $10,000
Female	Engineering	Mathematics	Above Calculus III (math major or minor)	Yes	Yes	Yes	3.75-4.0	$30,000-$40,000
Female	Social Sciences	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	College Algebra	Yes	No	Yes	3.75-4.0	$10,000-$20,000
Male	Accounting, Economics, Finance	None	Calculus III	No	Yes	Yes	3.5-3.75	$50,000-$60,000
Male	Social Sciences	Language (English, Spanish, French, Italian, German)	None	Yes	Yes	Yes	3.75-4.0	$30,000-$40,000
Female	Social Sciences	Language (English, Spanish, French,	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.75-4.0	$10,000-$20,000

		Italian, German)						
Female	Psychology	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus II	No	Yes	Yes	3.5-3.75	Less than $10,000
Male	Accounting, Economics, Finance	None	None	Yes	Yes	Yes	3.75-4.0	$60,000-$70,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Calculus II	No	Yes	Yes	3.75-4.0	$30,000-$40,000
Female	Other Business	Communications	Survey of Calculus/Calculus I	Yes	No	Yes	3.5-3.75	$60,000-$70,000
Female	Accounting, Economics, Finance	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	Yes	No	Yes	3.75-4.0	$50,000-$60,000
Female	Engineering	Mathematics	Above Calculus III (math major or minor)	Yes	Yes	Yes	3.75-4.0	$40,000-$50,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	No	Yes	No	3.5-3.75	$40,000-$50,000
Female	Accounting, Economics, Finance	Other Business	None	Yes	Yes	Yes	3.75-4.0	$50,000-$60,000
Female	Communications	Social Sciences	None	Yes	Yes	No	3.75-4.0	$20,000-$30,000
Female	Social Sciences	Social Sciences	None	Yes	Yes	Yes	3.5-3.75	$80,000-$90,000
Female	Social Sciences	None	College Algebra	Yes	Yes	Yes	3.75-4.0	$40,000-$50,000
Female	Other	Social Sciences	None	Yes	No	Yes	3.75-4.0	$40,000-$50,000
Male	Computer Science	None	Calculus II	Yes	Yes	No	3.0-3.25	$70,000-$80,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Language (English, Spanish, French, Italian, German)	Calculus II	No	Yes	No	3.5-3.75	More than $100,000
Male	Accounting, Economics, Finance	None	None	Yes	No	No	3.75-4.0	$30,000-$40,000

Male	Accounting, Economics, Finance	Social Sciences	Survey of Calculus/Calculus I	Yes	No	No	2.75-3.0	$40,000-$50,000
Female	Other Business	Other	Survey of Calculus/Calculus I	No	No	No	3.25-3.5	$40,000-$50,000
Female	Other Business	None	Survey of Calculus/Calculus I	No	No	Yes	3.5-3.75	$30,000-$40,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	Yes	Yes	Yes	3.75-4.0	Less than $10,000
Female	Social Sciences	Other	College Algebra	No	Yes	Yes	3.75-4.0	$10,000-$20,000
Male	Accounting, Economics, Finance	Mathematics	Above Calculus III (math major or minor)	Yes	Yes	No	3.5-3.75	$60,000-$70,000
Female	Social Sciences	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	No	Yes	Yes	3.75-4.0	$40,000-$50,000
Female	Accounting, Economics, Finance	Social Sciences	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.5-3.75	$70,000-$80,000
Female	Language (English, Spanish, French, Italian, etc.)	Art (Architecture, Art History, Visual Arts, etc.)	None	No	Yes	Yes	3.0-3.25	$30,000-$40,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	None	Calculus III	Yes	Yes	Yes	3.75-4.0	$30,000-$40,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Above Calculus III (math major or minor)	No	Yes	No	3.75-4.0	$30,000-$40,000
Female	Accounting, Economics, Finance	None	None	Yes	Yes	No	3.75-4.0	$50,000-$60,000
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Language (English, Spanish, French, Italian, German)	College Algebra	Yes	Yes	Yes	3.75-4.0	$20,000-$30,000
Female	Other Business	None	Calculus III	Yes	No	Yes	3.75-4.0	$20,000-$30,000
Female	Science (Biology, Chemistry,	Science (Biology,	Calculus II	Yes	Yes	Yes	3.5-3.75	$30,000-$40,000

	Biochemistry, Physics, etc.)	Chemistry, Biochemistry, Physics, etc.)						
Female	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Science (Biology, Chemistry, Biochemistry, Physics, etc.)	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.5-3.75	Less than $10,000
Female	Social Sciences	Language (English, Spanish, French, Italian, German)	College Algebra	Yes	Yes	No	3.5-3.75	$10,000-$20,000
Female	Other Business	Language (English, Spanish, French, Italian, German)	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.5-3.75	$40,000-$50,000
Female	Other	None	None	No	Yes	No	3.5-3.75	$20,000-$30,000
Male	Accounting, Economics, Finance	None	Survey of Calculus/Calculus I	Yes	No	No	3.25-3.5	$30,000-$40,000
Male	Other Business	None	None	Yes	Yes	No	3.5-3.75	Less than $10,000
Female	Accounting, Economics, Finance	None	Survey of Calculus/Calculus I	No	No	No	3.75-4.0	$60,000-$70,000
Male	Accounting, Economics, Finance	None	Survey of Calculus/Calculus I	Yes	No	No	3.75-4.0	$40,000-$50,000
Female	Accounting, Economics, Finance	Accounting, Economics, Finance	Calculus II	Yes	Yes	Yes	3.75-4.0	$60,000-$70,000
Female	Social Sciences	Language (English, Spanish, French, Italian, German)	Calculus II	Yes	Yes	Yes	3.75-4.0	$20,000-$30,000
Female	Other Business	Communications	Survey of Calculus/Calculus I	Yes	No	No	3.0-3.25	$20,000-$30,000
Female	Engineering	Mathematics	Above Calculus III (math major or minor)	No	Yes	Yes	3.25-3.5	$50,000-$60,000
Female	Language (English, Spanish, French, Italian, etc.)	Religious Studies	Calculus II	Yes	Yes	Yes	3.75-4.0	$10,000-$20,000
Female	Communications	None	College Algebra	Yes	Yes	No	3.25-3.5	Less than $10,000

Female	Social Sciences	Communications	Survey of Calculus/Calculus I	Yes	Yes	Yes	3.75-4.0	$40,000-$50,000
Male	Accounting, Economics, Finance	Mathematics	Above Calculus III (math major or minor)	Yes	Yes	Yes	3.25-3.5	$40,000-$50,000

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