

# Team 02 Project

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## Introduction to Analysis

Our team conducted an analysis to determine how recent LSU Bachelor's degree graduate's past internships affect their starting salary after graduation, if at all.

To do this, we created a discrete variable, **salaryBracket**, that divided graduates into three categories: low salary, medium salary, and high salary. The limits for each bracket were calculated using boxplot statistics—anything within the “box” (between the first and third quartile) is considered a “medium” salary, while anything outside of the “box” is labeled “high” or “low”. The brackets were calculated using data on all LSU Bachelor's Degree graduates as an aggregate, not by major. Data with salary values of less than \$15,000 were removed because the national minimum wage in the United States is \$7.25 an hour—a full-time position paying minimum wage for the year pays more than \$15,000, so all values below this were considered to be typos. Records with a salary under The minimum and maximum for the “medium” salary bracket are \$32,000 and \$62,000, respectively.

Our original hypothesis inferred that students who had participated in an internship prior to graduation would be amongst those who have a higher starting salary.

## Steps for Process

We first compared the starting salaries for those accepted full time against 3 different indicators:

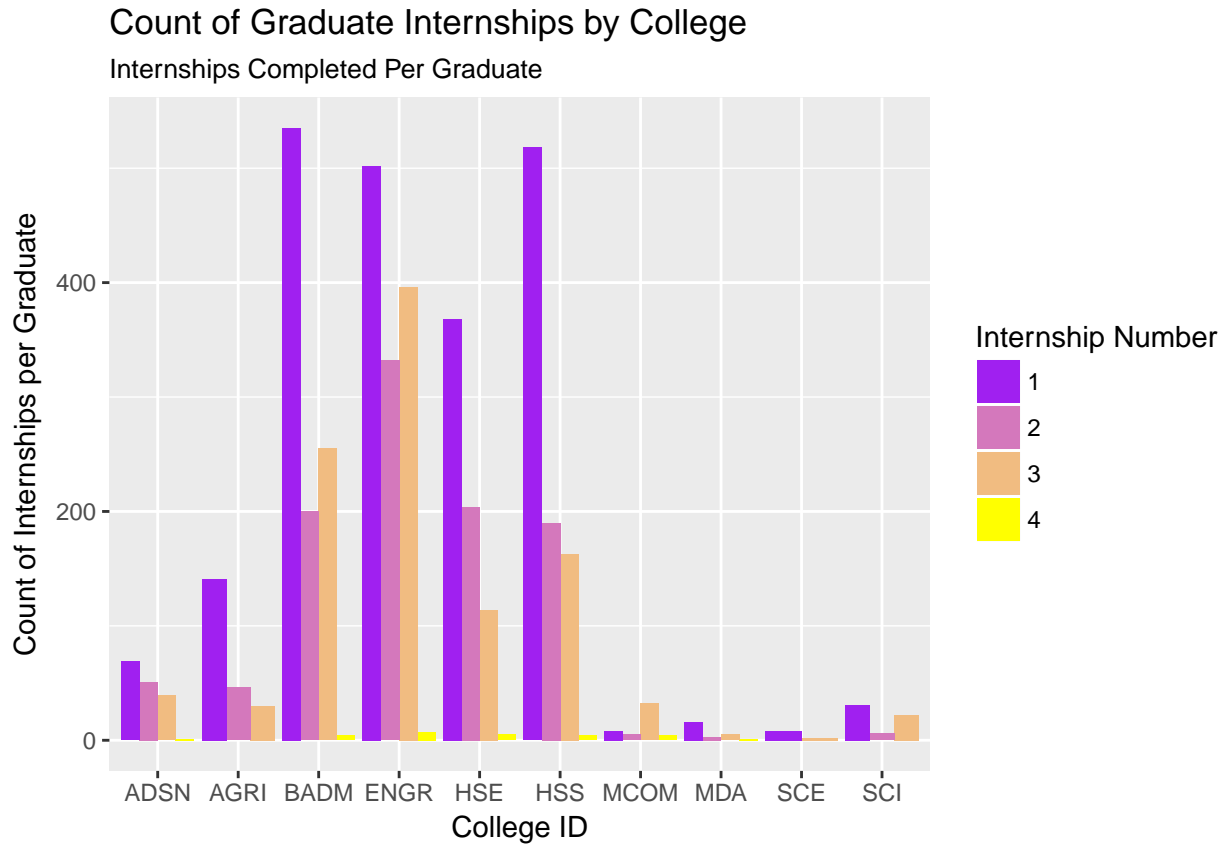
- if the graduate had a previous internship
- the compensation (paid or unpaid) of the internship they had
- if the graduate stayed with that company

Then, we broke down the salary performance statistics we found by LSU Majors against that of the national average from a national study conducted by the Wall Street Journal, “Increase Salary by Major”.

## Number of Internships

Of the recent LSU undergrad graduates from dec2014 to aug2017, there was a total of 7548 completed internships, with some students completing as many as 4.

The following graph displays the count of the total number of internships individual graduates completed per college.



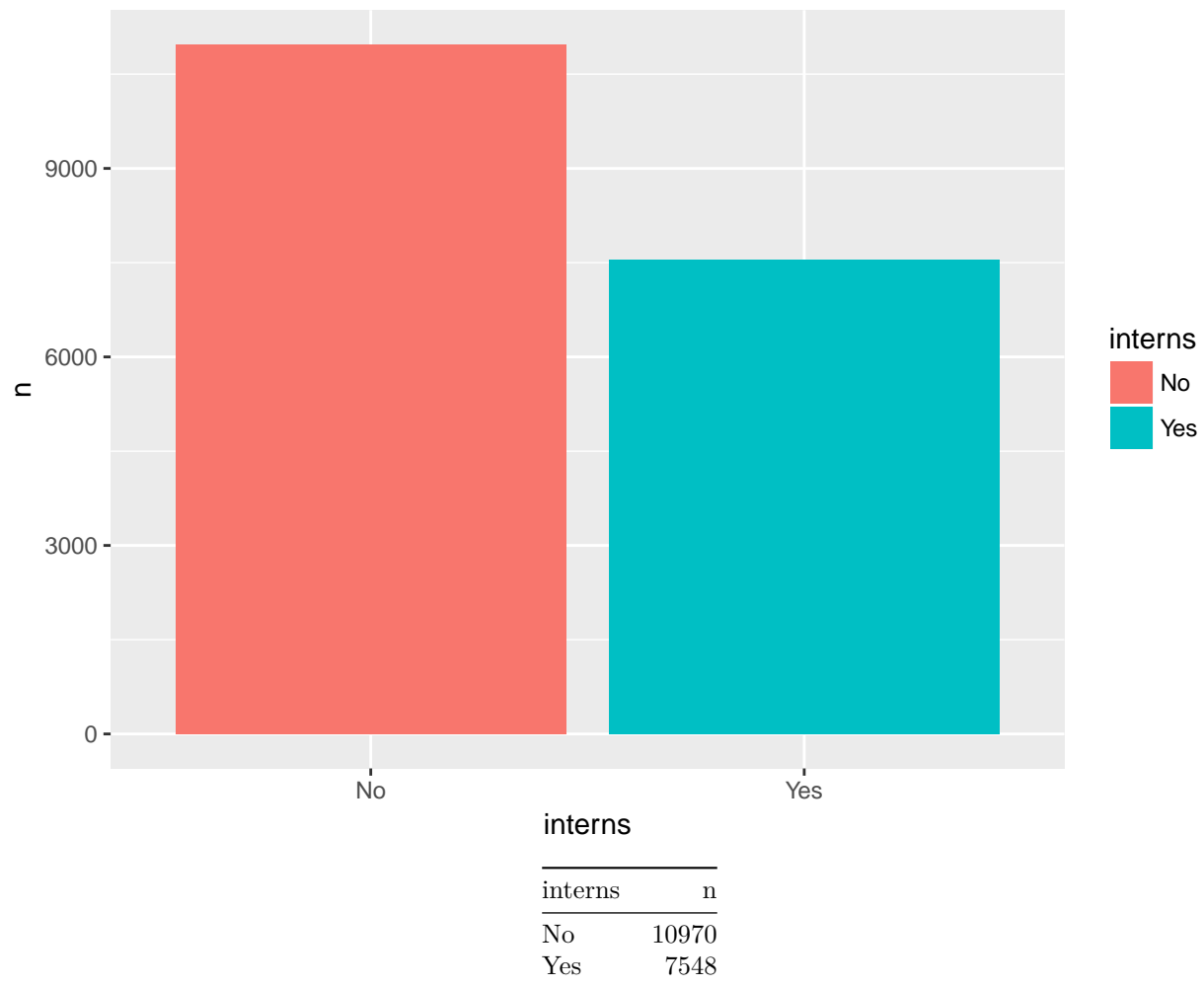
The College of Engineering has the most internships with a total of 1237 internships completed, and the College of Coast and Environment has the least internships completed at 10 total.

Engineering's internships make up 28.7% of the total internships completed.

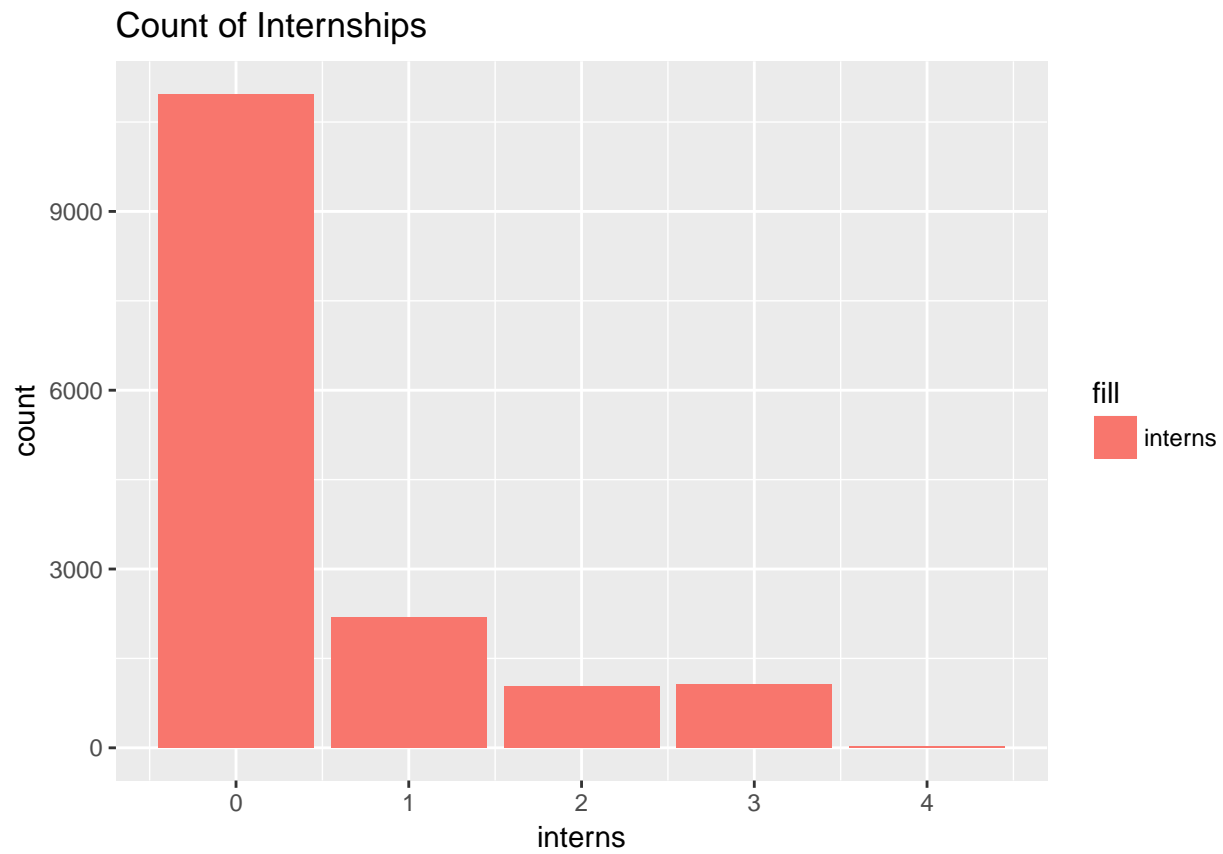
## Highest Number of Internships

Internship Number	College	Total Internships
1	Business	535
2	Engineering	332
3	Engineering	396
4	Engineering	7

The total number of students who completed internships were 28.2% of the graduating class.



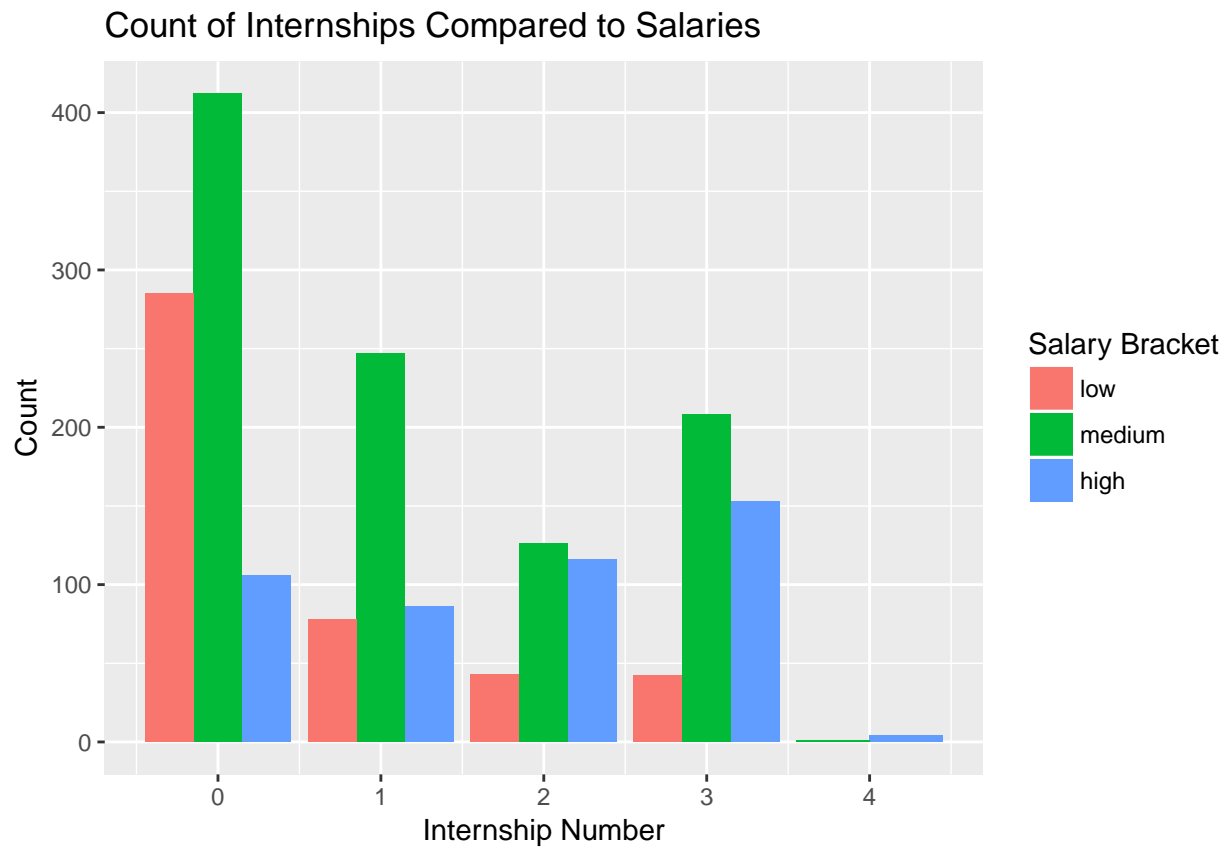
According to the graph and table above, there are 7548 students who have done internships, and there are 10970 students who did not have internships.



interns	n	percentages
0	10970	71.8%
1	2196	14.4%
2	1037	6.8%
3	1058	6.9%
4	26	0.2%

The graph and table above represents following informations :

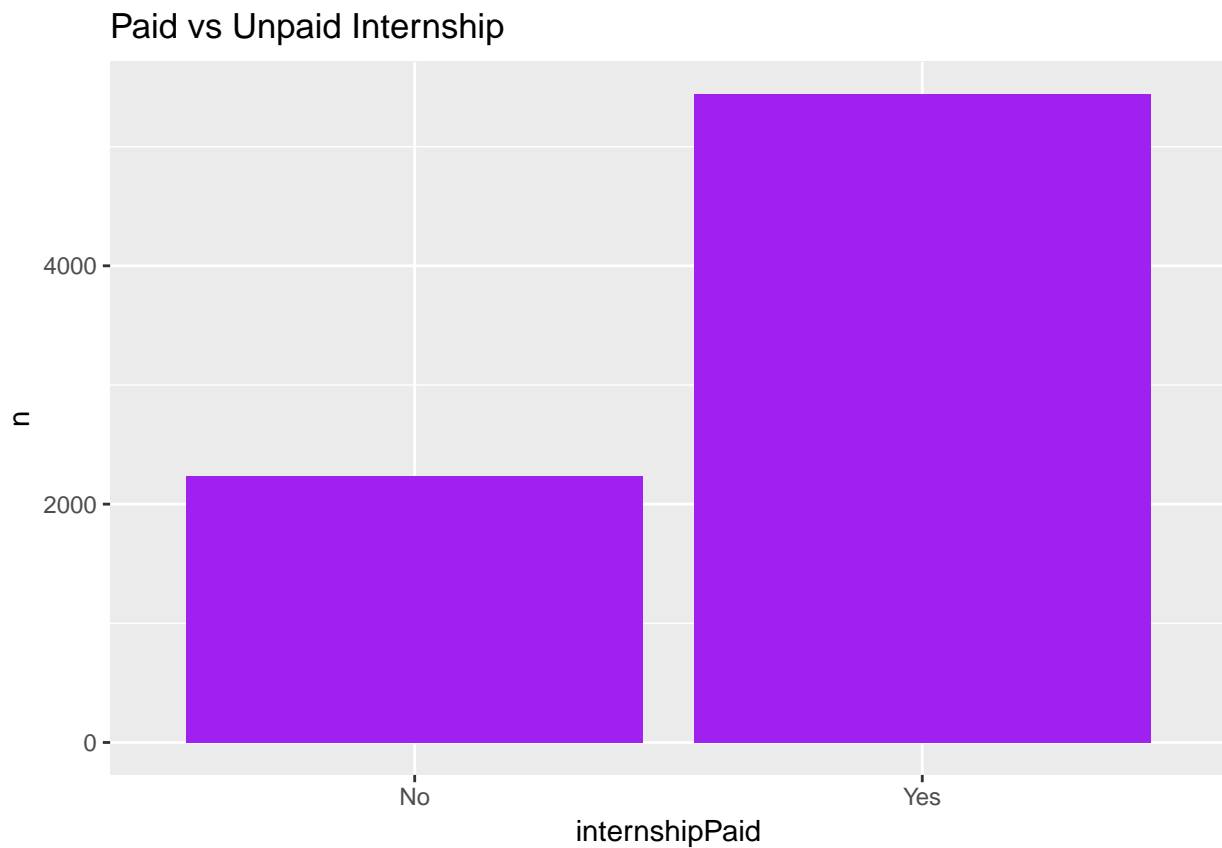
- There are 10970 students, which is 71.8% of total students, have done 0 internship.
- There are 2196 students, which is 14.4% of total students, have done 1 internship.
- There are 1037 students, which is 6.8% of total students, have done 2 internship.
- There are 1058 students, which is 6.9% of total students, have done 3 internship.
- There are 26 students, which is 0.2% of total students, have done 4 internship.



interns	salaryBracket	n	percentage
0	low	285	35.5%
0	medium	412	51.3%
0	high	106	13.2%
1	low	78	19.0%
1	medium	247	60.1%
1	high	86	20.9%
2	low	43	15.1%
2	medium	126	44.2%
2	high	116	40.7%
3	low	42	10.4%
3	medium	208	51.6%
3	high	153	38.0%
4	medium	1	20%
4	high	4	80%

This graph tells us that students with more internships have less low salary fraction than students with no internship experience.

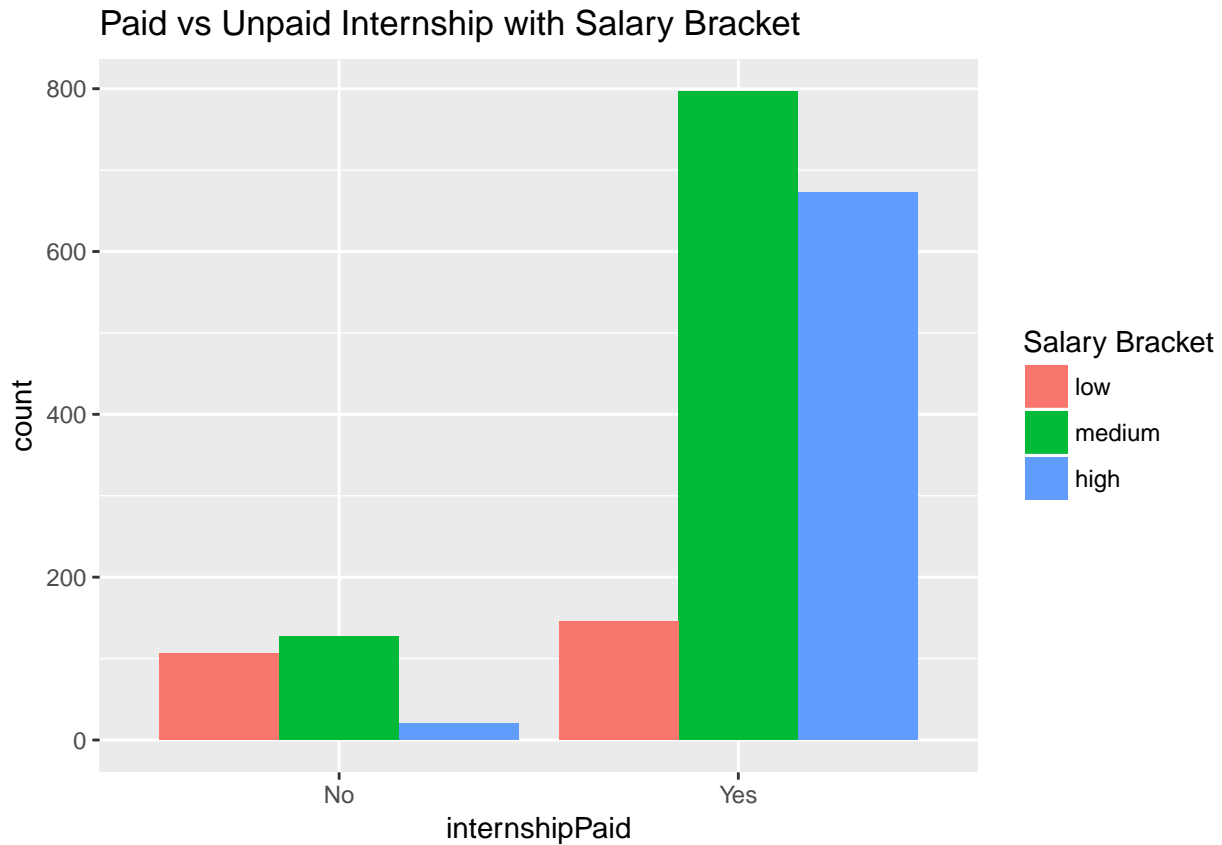
## Paid or Unpaid Internships



As noted, 4981 graduates had internships while completing their degree.

From this number there is a total of 2240 unpaid internships, and 5440 paid internships taken by students.

In this analysis we will find out about the correlation between paid and unpaid internship on the starting salaries.



From the dataset we found out that 1867 get a job right after graduation. The distribution based on the salary bracket is :

- 20 graduates with unpaid internships, and 673 graduates with paid internships got high starting salaries.
- 127 graduates with unpaid internship, and 796 graduates with paid internship got medium starting salaries.
- 106 graduates with unpaid internship, and 145 graduates with paid internship got low starting salaries.

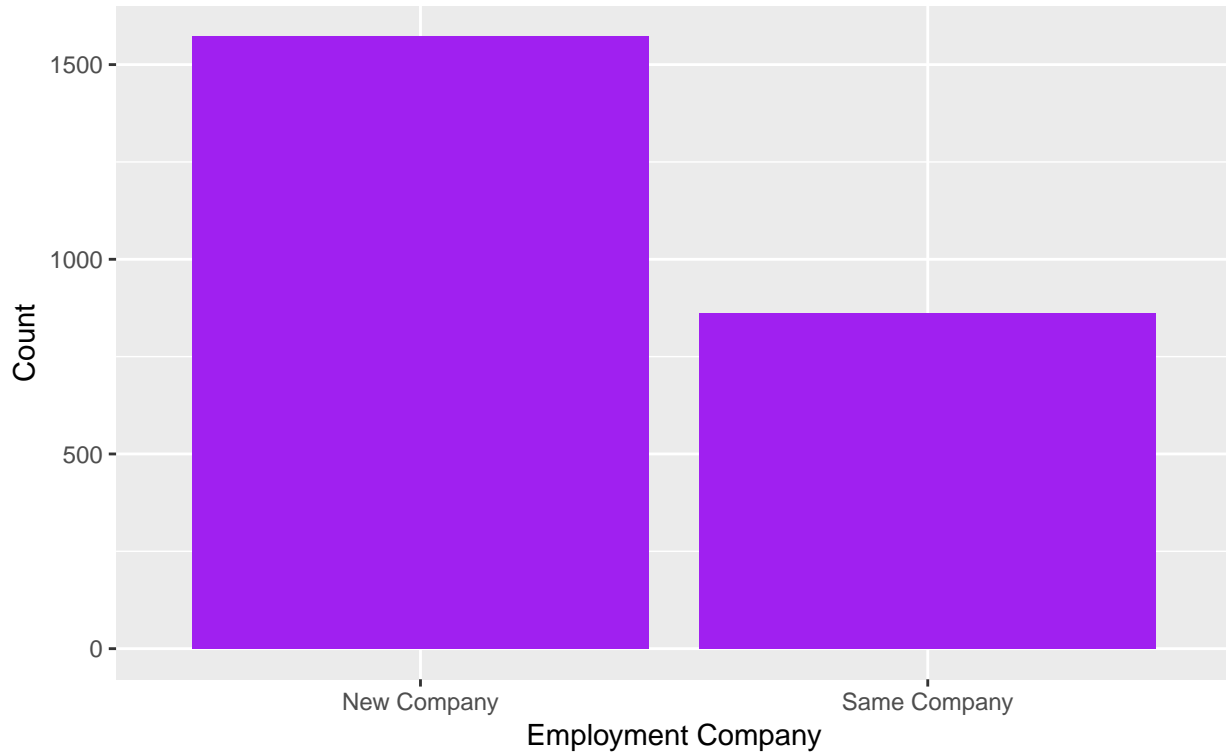
Based on data and graph above we can conclude that paid internship have highly positive correlation on starting salary with the highest percentage of 42.6% for medium starting salary, and second highest of 36.0% for high starting salary, together making up more than half of those having an internship.

## Internship Turnovers

In the following analysis, we compared interns who took a full-time position with the same company versus those who took a full-time position at a new company. We filtered out any graduate who did not have a company listed for both their internship and full-time position.

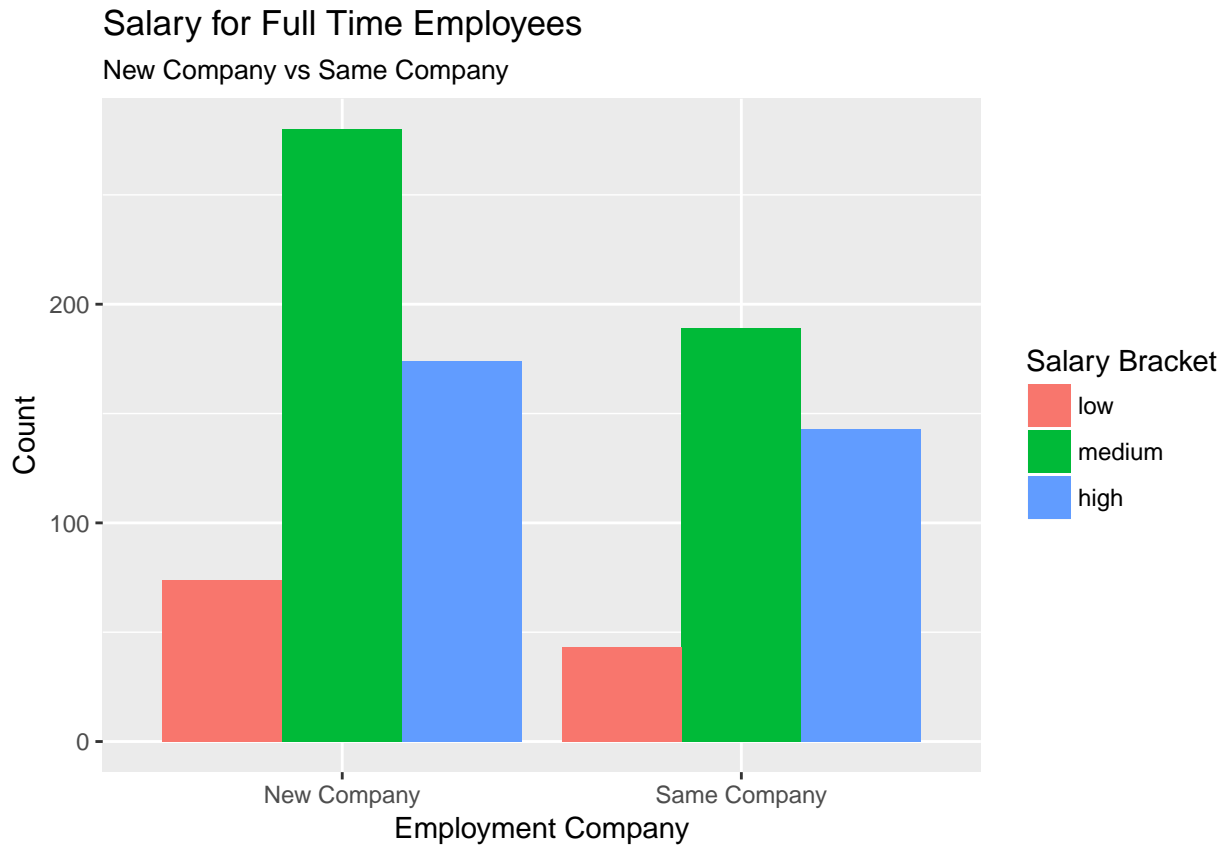
### New vs Same Company

Comparing Interns Who Left or Stayed Upon Graduation



As seen in the graph above, 1572 decided to venture to a position in a new company while 862 took on a fulltime position with the same company.





In breaking down the Employment Company by Salary Brackets, we found that overall there were slightly less people in each salary bracket who stayed with the same company, ultimately with new companies offering more high income salaries with 19.3% offering high income salaries and 31.0% serving medium salaries.

In addition to the graph above and with the removal of outliers - of the 3265 students who submitted their salary for full-time positions, we found the following . .

Employment Company	Total	Percent of Full Time	Salary Total	Salary Average
Same Company	862	19.4%	\$29,194,947	\$29,194,947
New Company	1572	35.5%	\$36,931,356	\$52,384.90

## How LSU Graduates Stack Up

To put everything in perspective, we wanted to compare the starting salaries of LSU graduates to that of the average college graduate in the US. To do this, we used a dataset from *The Wall Street Journal* (WSJ) that included the median starting salaries of college graduates by major: [http://online.wsj.com/public/resources/documents/info-Degrees\\_that\\_Pay\\_you\\_Back-sort.html](http://online.wsj.com/public/resources/documents/info-Degrees_that_Pay_you_Back-sort.html).

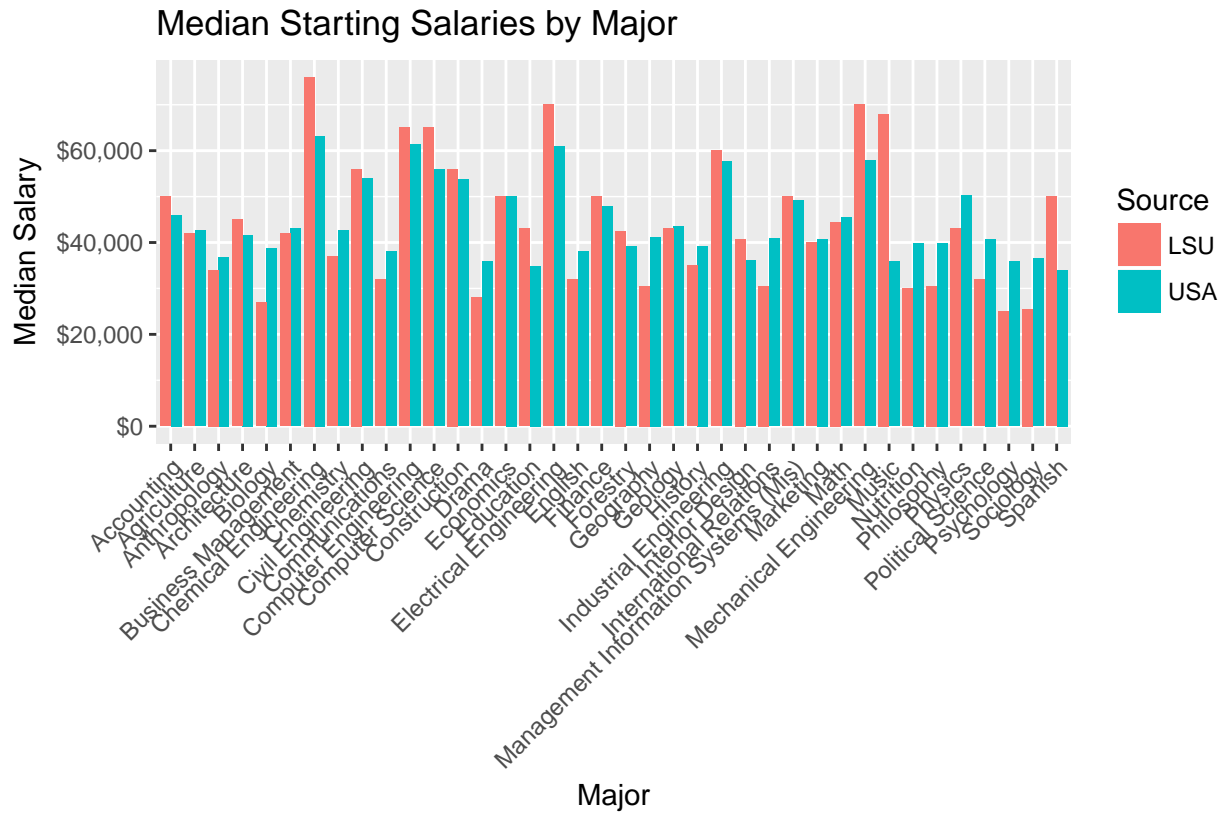
Of the 50 majors listed in the WSJ dataset, only 39 matched up with the majors of the LSU graduates who went into the workforce after graduation. Some of the major names had to be adjusted to match up properly to the WSJ dataset.

The changes that were made:

LSU	WSJ
biological sciences	biology
management	business management
theatre	drama
fine arts - art history	art history
construction management	construction
forestry - forest management	forestry
information systems and decision sciences	management information systems (mis)
mathematics	math
nutrition and food sciences	nutrition
international studies	international relations

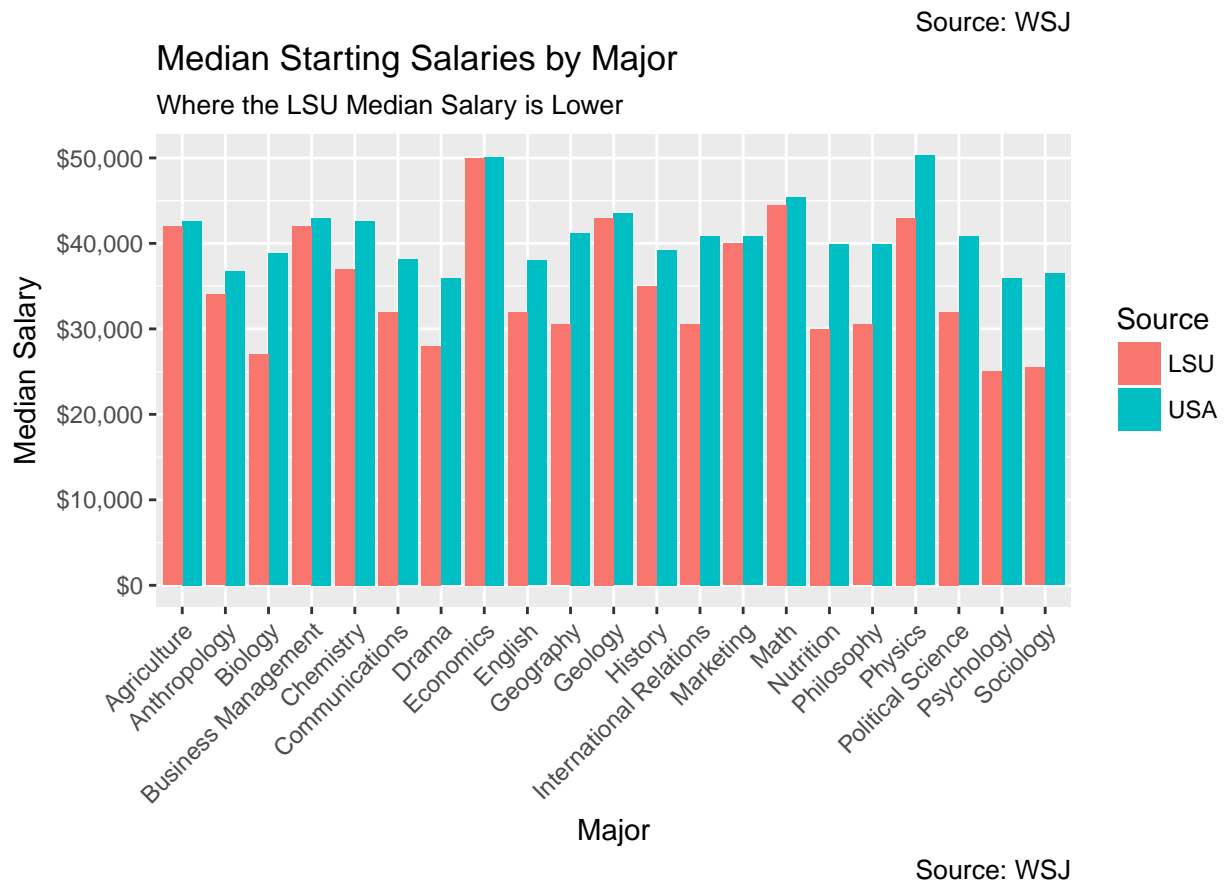
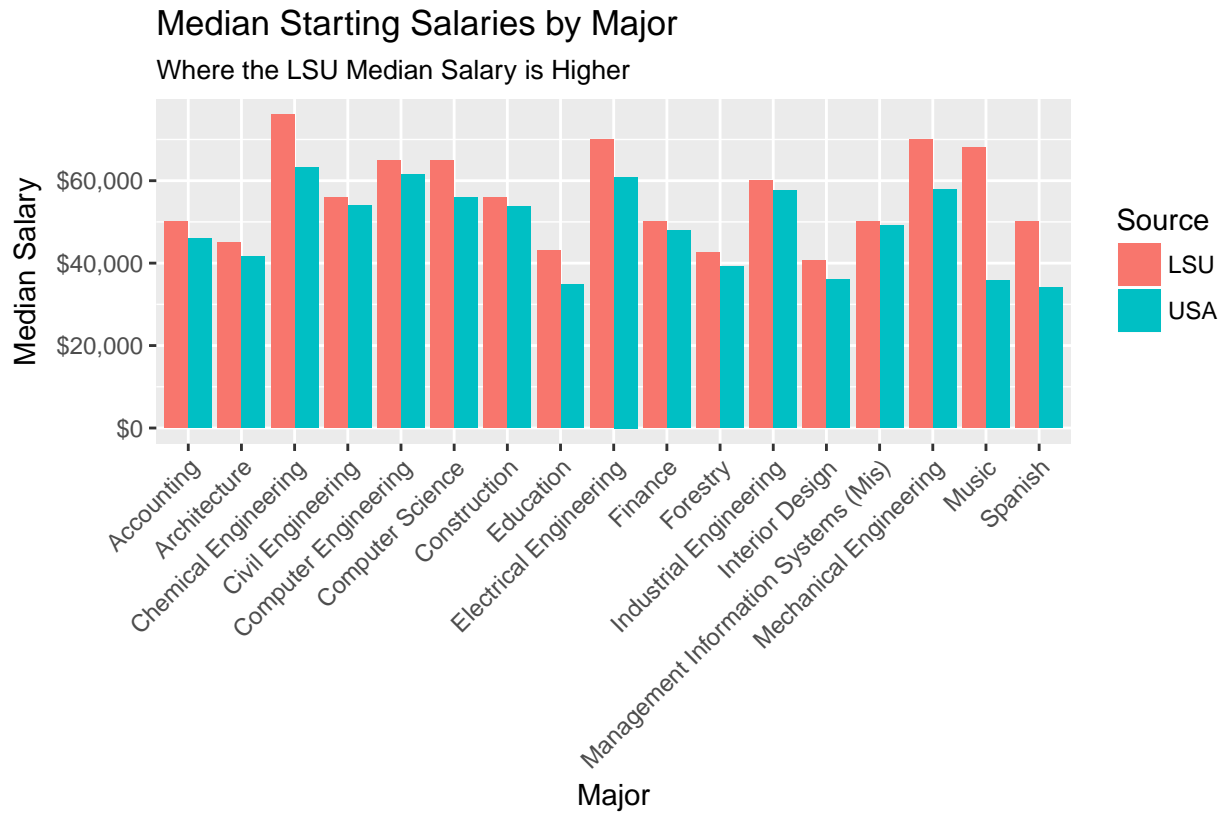
Also :

- agricultural & extension education, agricultural education- grades 6 - 12, agriculture and extension education, dual certification general/special education: grades 1-5, early childhood education: pk-3 teacher certification, education, educational leadership, educational leadership & research, elementary education grades 1-5, elementary grades education, gifted education, human resource education, music education, secondary education grades 6-12, special education were changed to **education**
- agricultural business, agricultural economics were changed to **agriculture**
- mass communication, mass communication & public affairs were changed to **mass communication**



Source: WSJ

There are 38 majors listed in this graph, so it might be hard to tell which is which. We've broken it down into two graphs instead.



As you can see, there are 17 LSU majors that pay equal to or higher than the national median and 21 LSU majors that pay less than the national median.

Some majors have a wider range of salaries than others, so we have included box-and-whisker plots at the end of this report for each major.

## Salary Box-and-Whisker Plots

Each figure shows the box-and-whisker plots of the majors of a particular college. The college of Coast & Environment is not pictured in this report because there was not enough data to generate a substantial box-and-whisker plot. Data with salary values above \$150,000 were removed because they are outliers that stretch the scale of the Y axis to the point of making the box-and-whisker plots hard to interpret. Data with salary values of less than \$15,000 were removed as well because the national minimum wage in the United States is \$7.25 an hour—a full-time position paying minimum wage for the year pays more than \$15,000, so all values below this were considered to be typos.

A few changes had to be made regarding the majors in the dataset:

- There were some majors listed as “NA” (not to be mistaken with **NA**), all under the College of Humanities and Social Sciences. These were renamed “Interdisciplinary Studies”
- Some records had a major listed with the wrong college, so the college names were reassigned by major, according to these rules:

Major	College
Biological Sciences	Science
Spanish	Humanities and Social Sciences
Mass Communication	Mass Communication
Mathematics	Science
Economics	Business

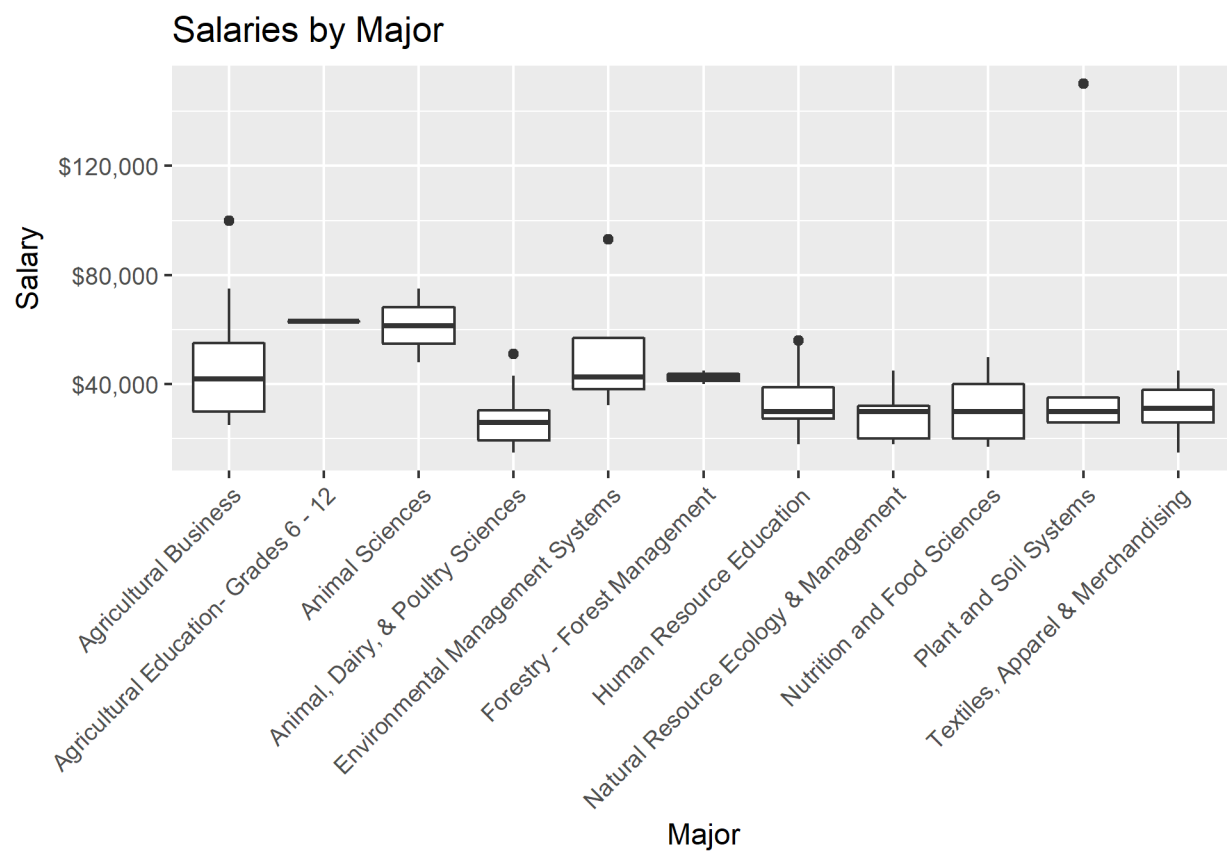


Figure 1: College of Agriculture

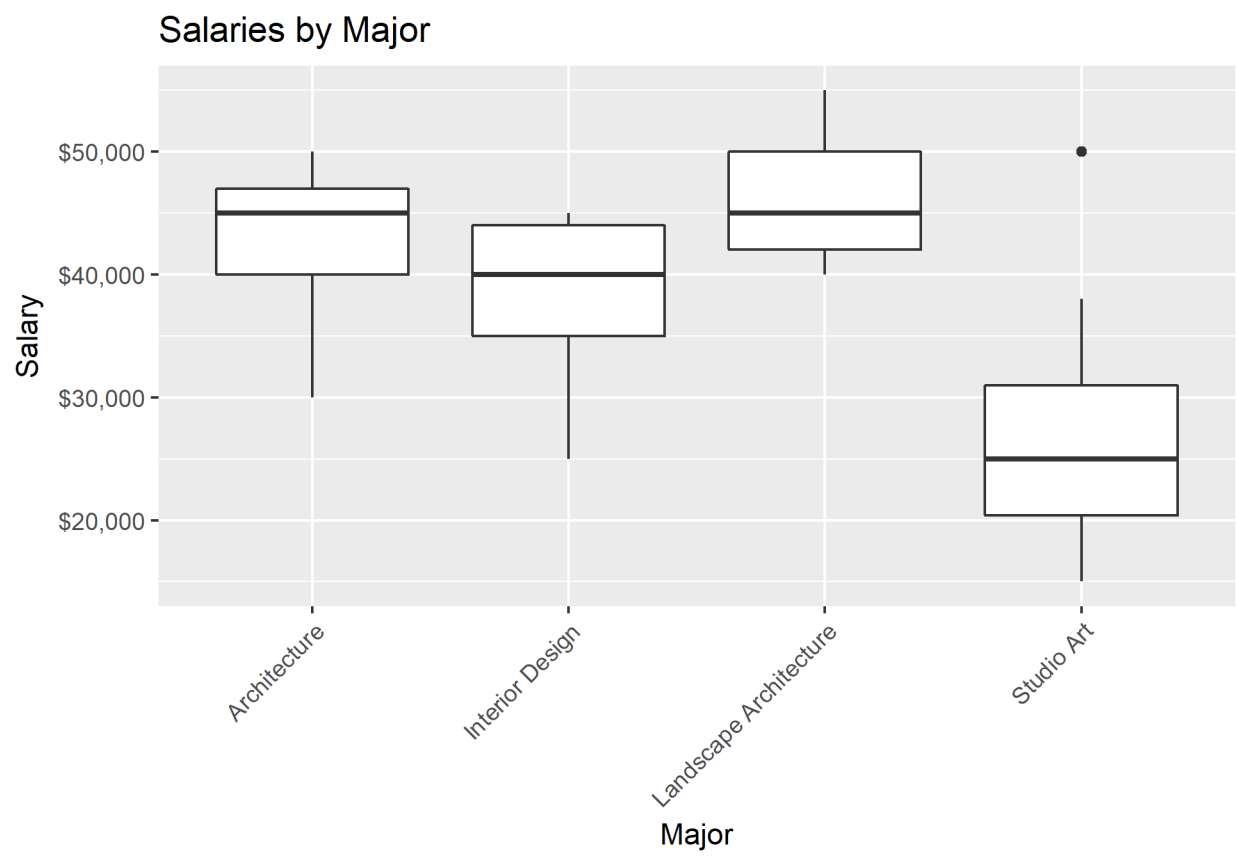


Figure 2: College of Art & Design



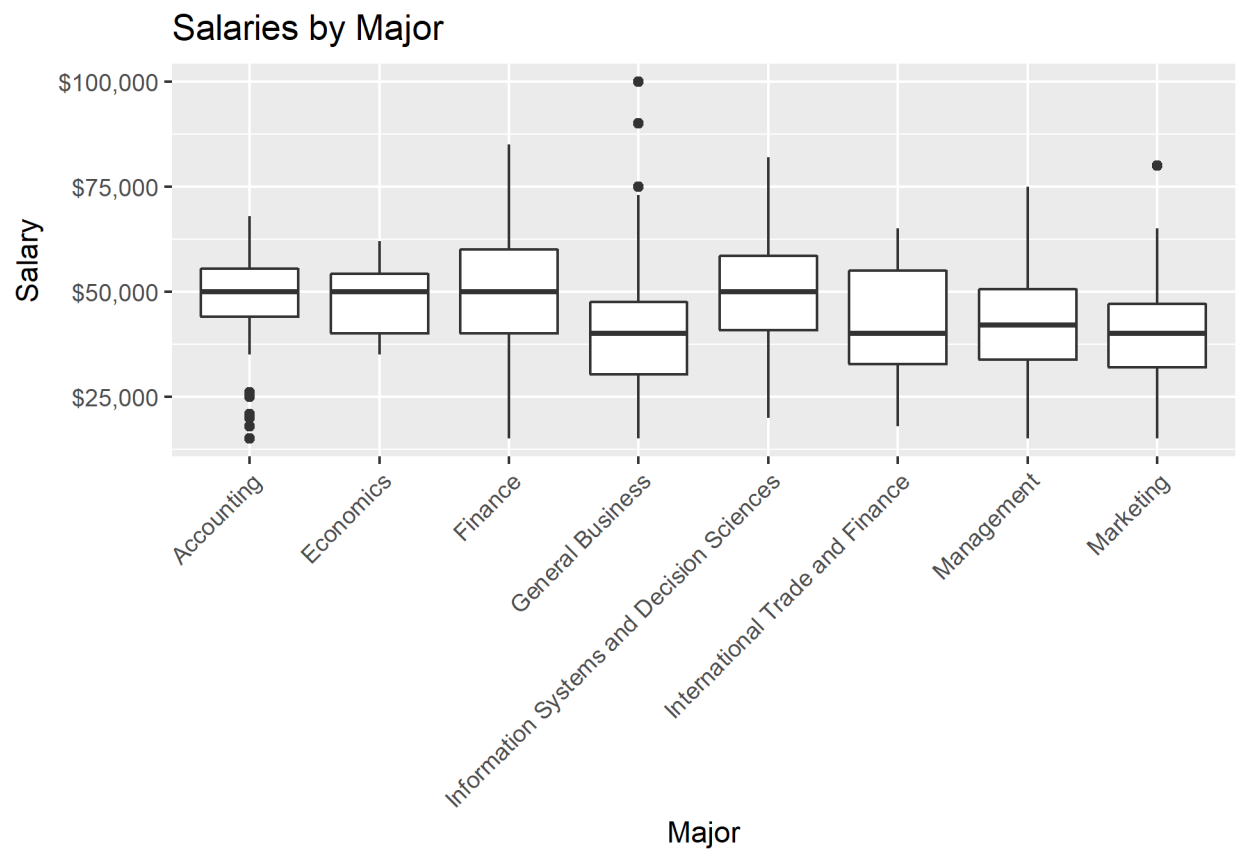


Figure 3: College of Business

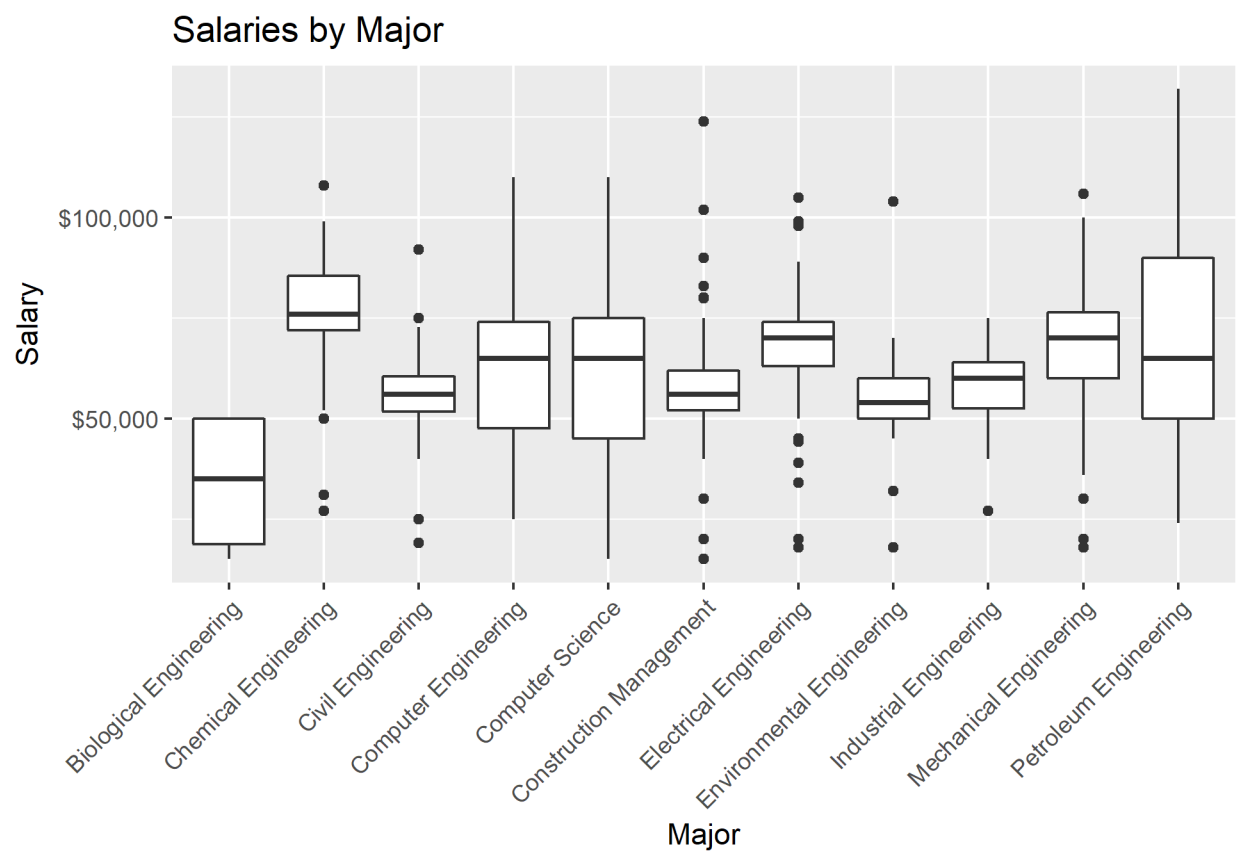


Figure 4: College of Engineering

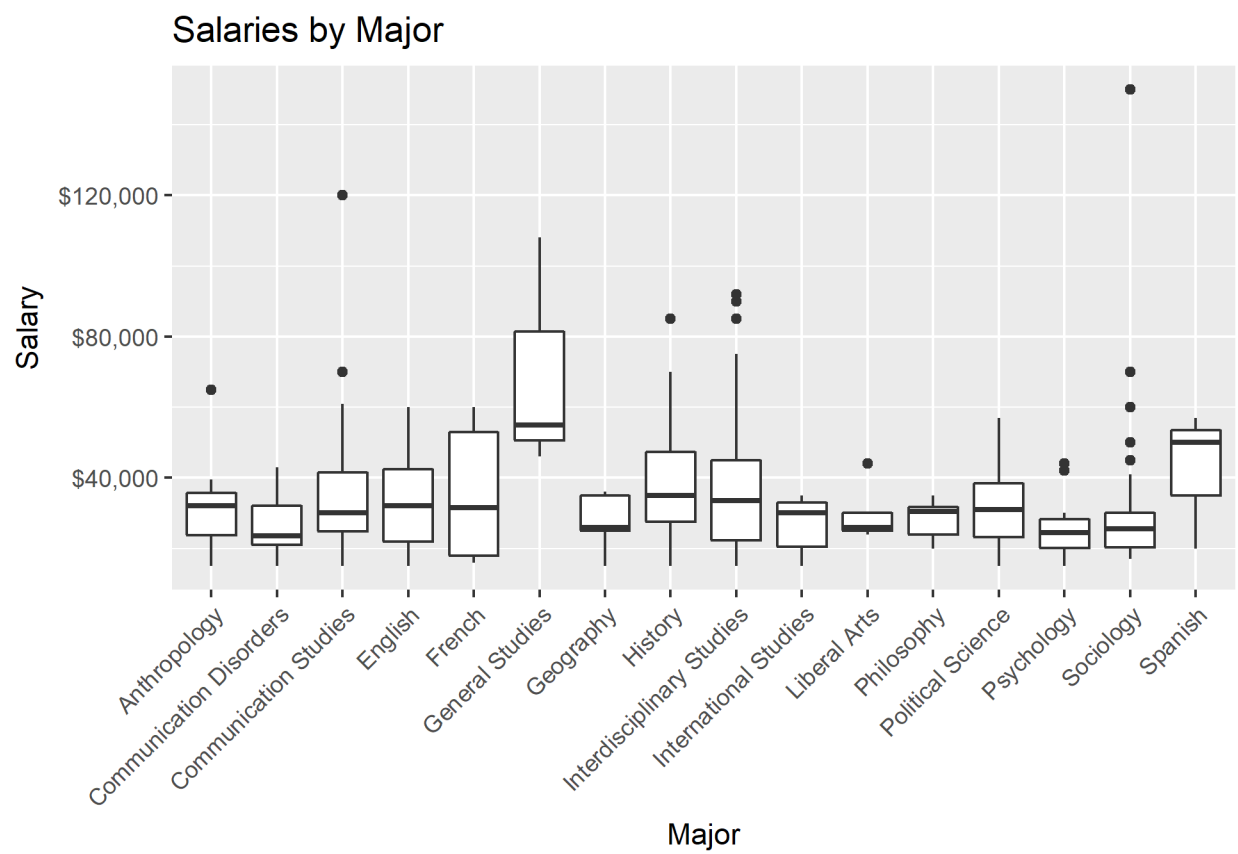


Figure 5: College of Humanities & Social Sciences

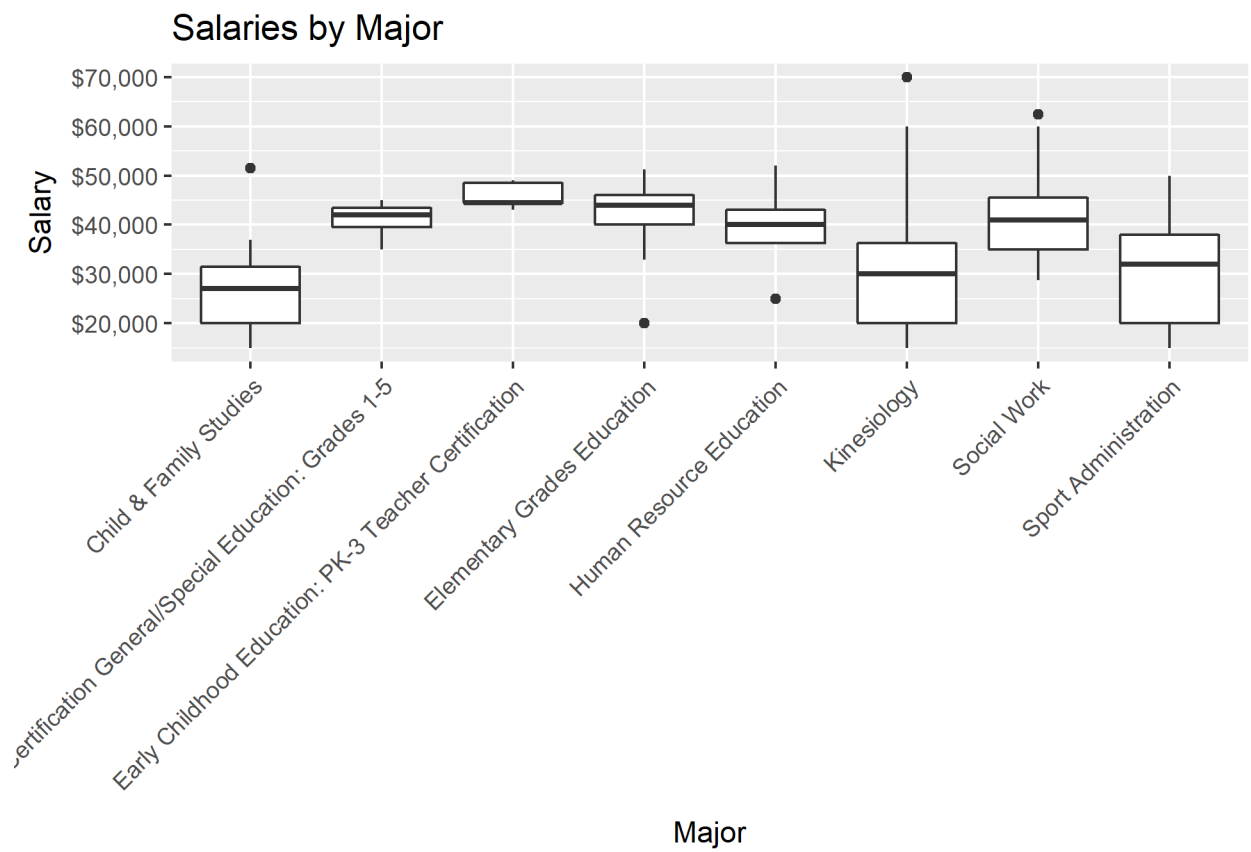


Figure 6: College of Human Sciences & Education

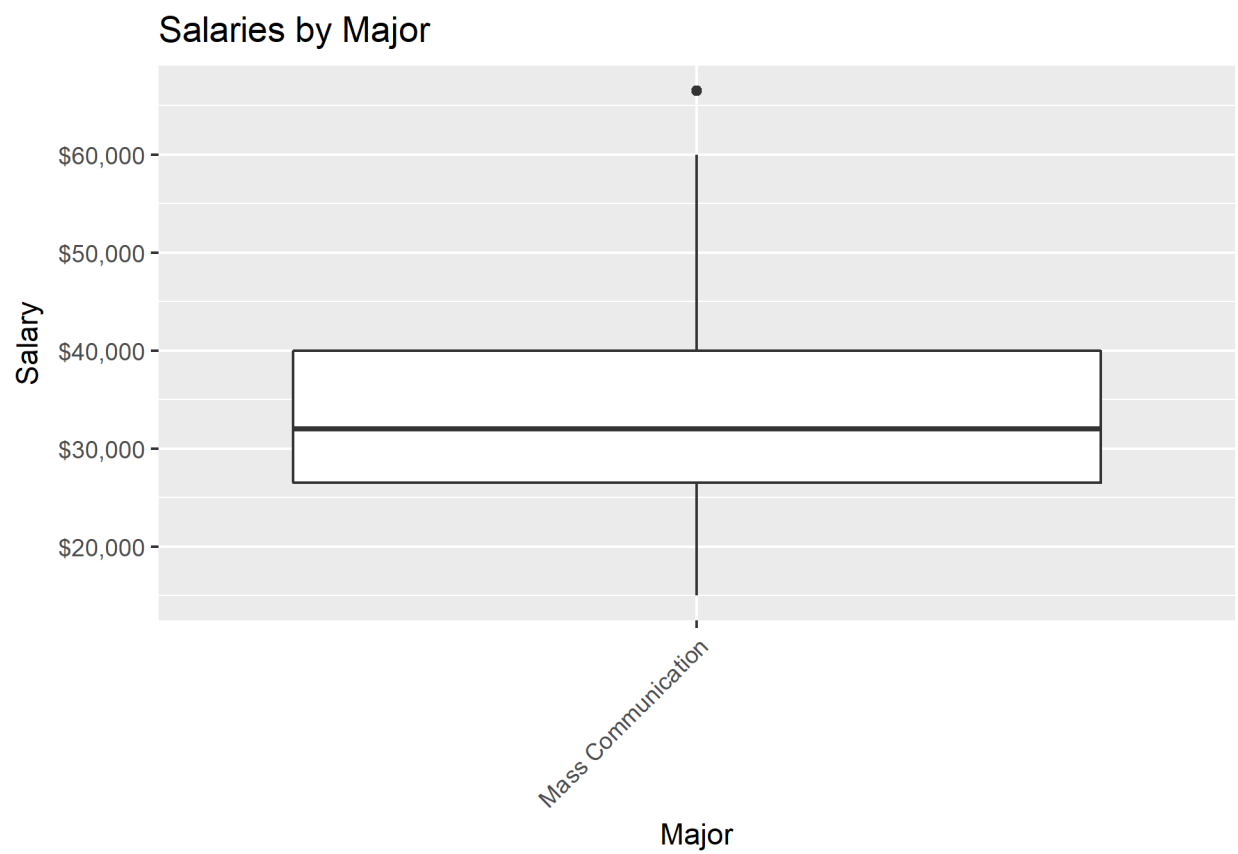


Figure 7: College of Mass Communication

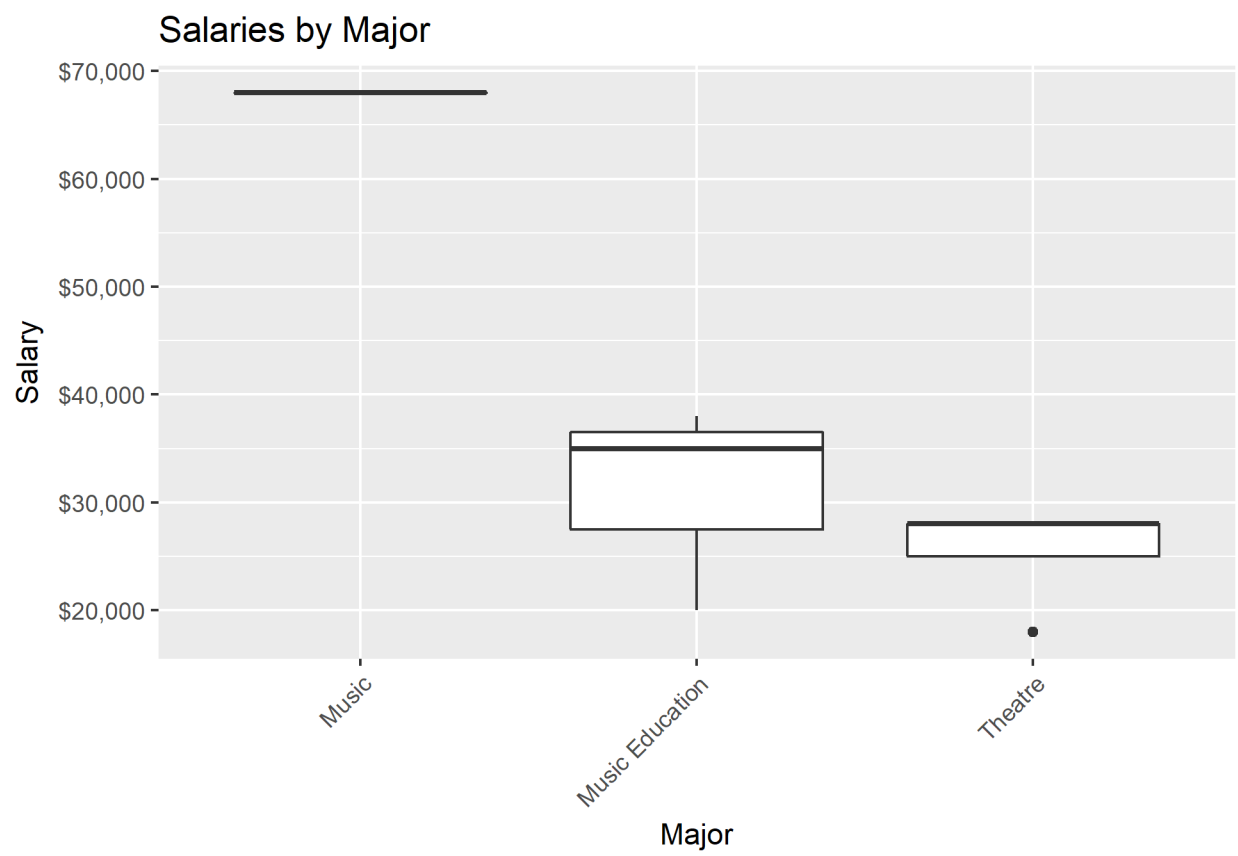


Figure 8: College of Music & Dramatic Arts

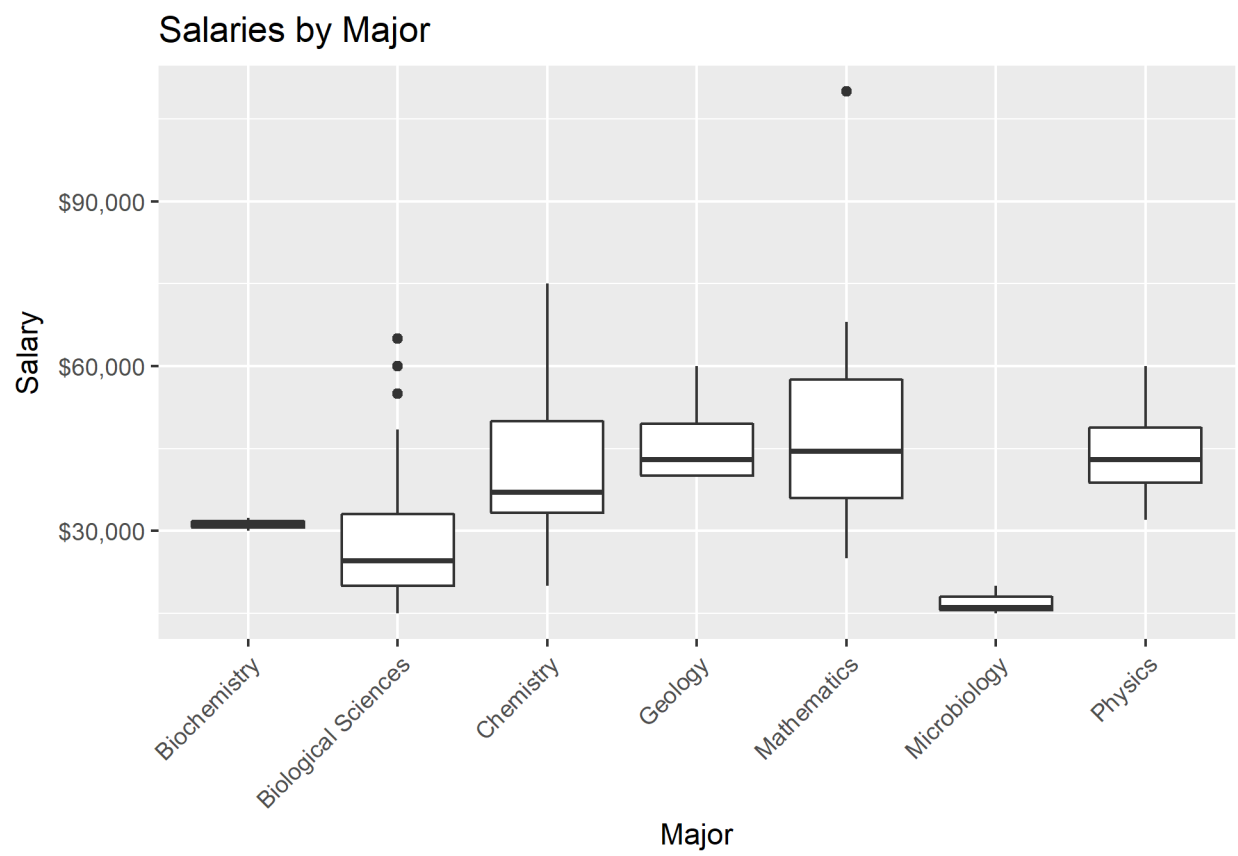


Figure 9: College of Science

## Work Cited

PayScale Inc, & Wall Street Journal. (n.d.). Salary Increase by Major. Retrieved April 20, 2018, from [http://online.wsj.com/public/resources/documents/info-Degrees\\_that\\_Pay\\_you\\_Back-sort.html](http://online.wsj.com/public/resources/documents/info-Degrees_that_Pay_you_Back-sort.html)