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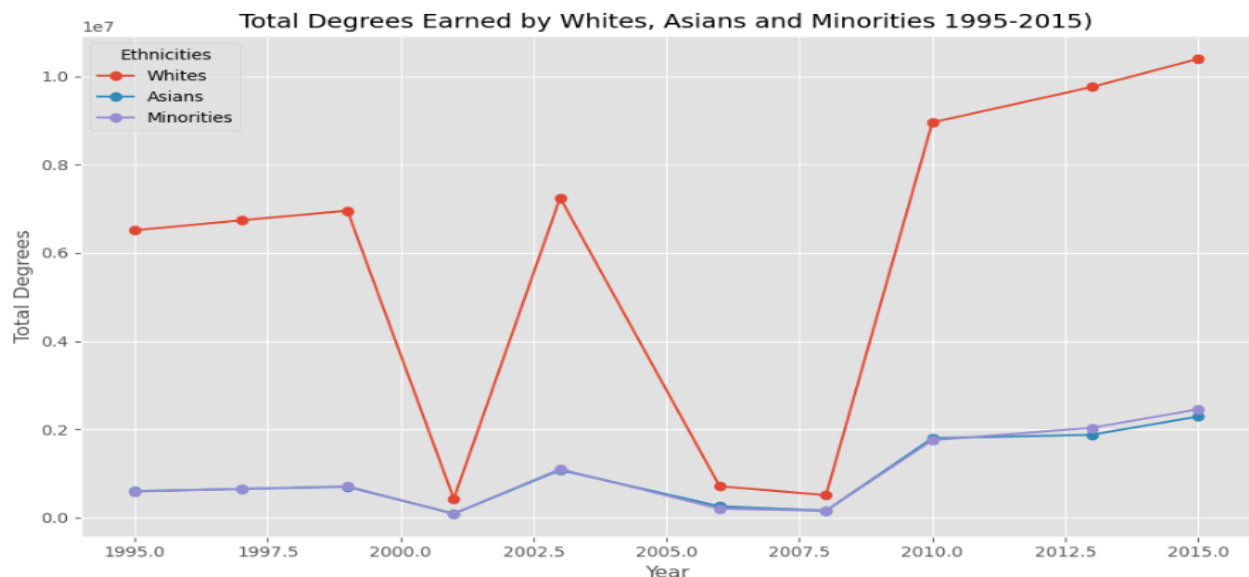
Socioeconomics of College Education Throughout the Years (1995-2015)

Intro:

Education has played a major role in the livelihood and improvement of societies for generations. In recent years however, we have seen a shift in societal opinions towards education as it has no longer become the only reliable source of reaching financial stability in the U.S. Our group decided to take a further look into the financial benefits of receiving an education. By taking a look at survey data from 1995 to 2015, we hope to compare which majors received the highest paying jobs, and if the salary has increased along with the rising cost of obtaining a degree. The questions we asked below, along with the provided visuals, provide a proper insight into the role education plays in individuals financial life as we hope to answer some fundamental questions pertaining to investing in an education.

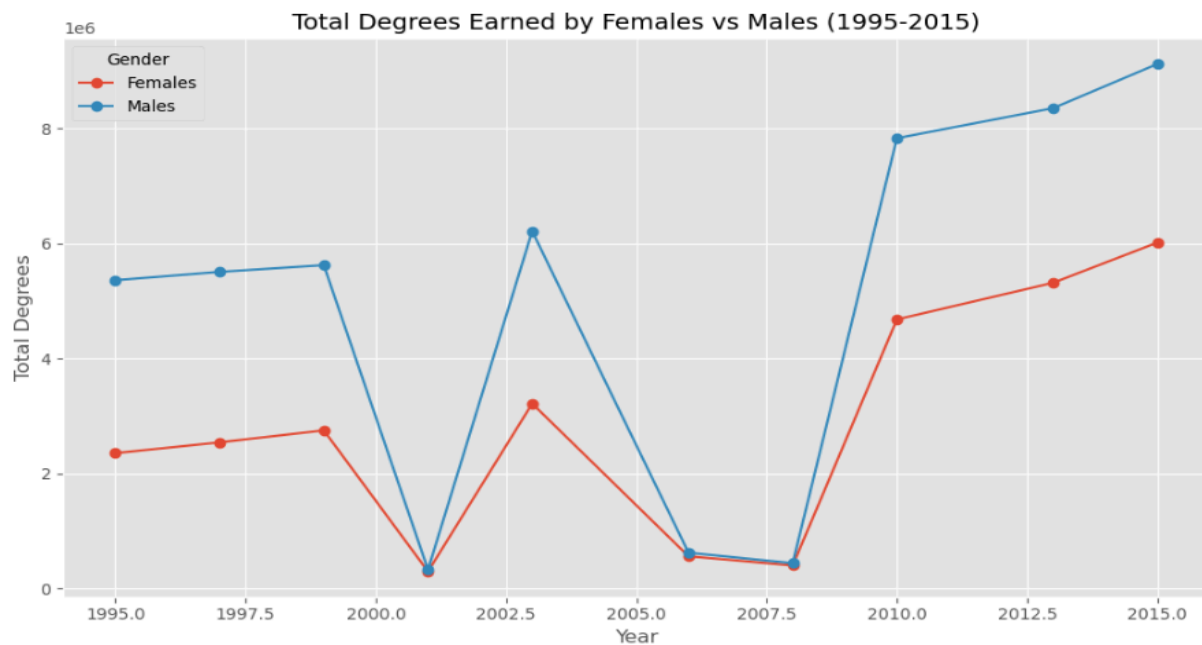
Questions:

Which ethnic groups obtained the most degrees over the twenty year period from 1995 to 2015?



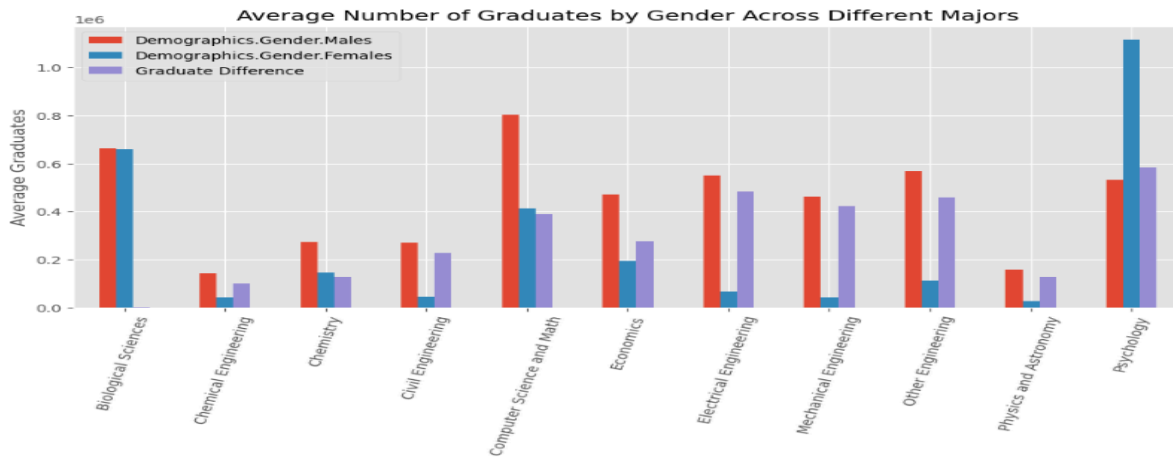
The number of White graduates is significantly higher than that of Asians and other minority groups. Asians and minorities are roughly comparable, but after 2010, minorities have noticeably surpassed Asians. Due to the internet bubble burst in 2001 and the financial crisis in 2008, there were two significant declines in 2001 and 2008, with the trend being more pronounced for Whites due to their larger base. This indicates that economic conditions significantly influence ethnicity.

Which gender obtained the most degrees over the twenty year period from 1995 to 2015?



The proportion of male graduates is significantly higher than that of females, with noticeable declines in 2001 and 2008 as well. This indicates that economic conditions significantly influence gender.

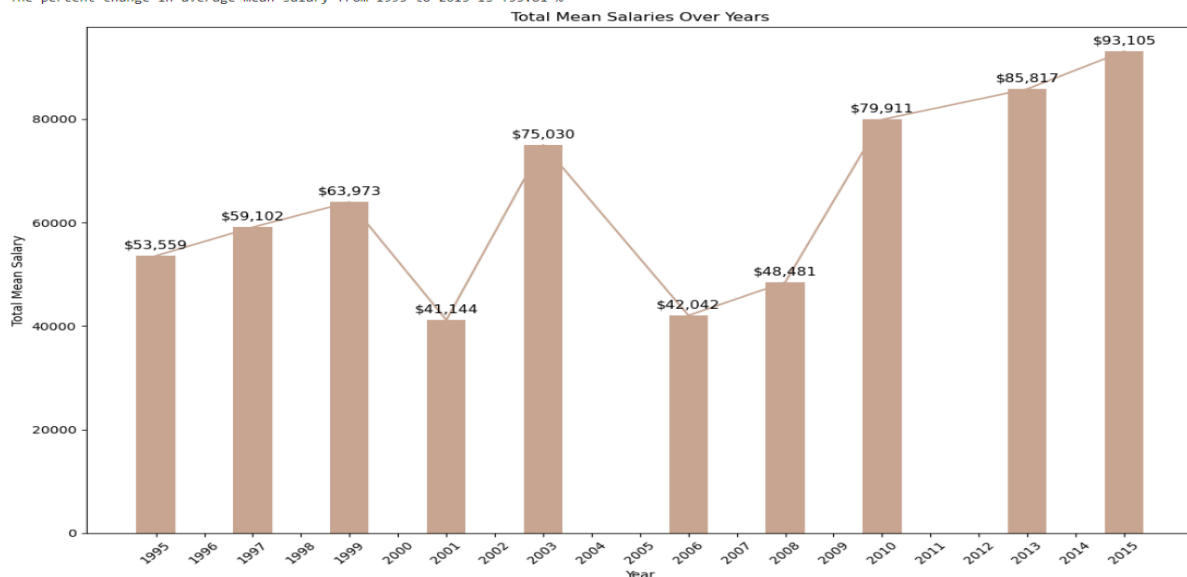
What's the difference amongst genders within each major across the twenty year period?



Interestingly, most fields have more males than females, but Psychology is the only field where females outnumber males.

What's the total average salary for all majors across the twenty year period and has it grown or declined? What caused the dips?

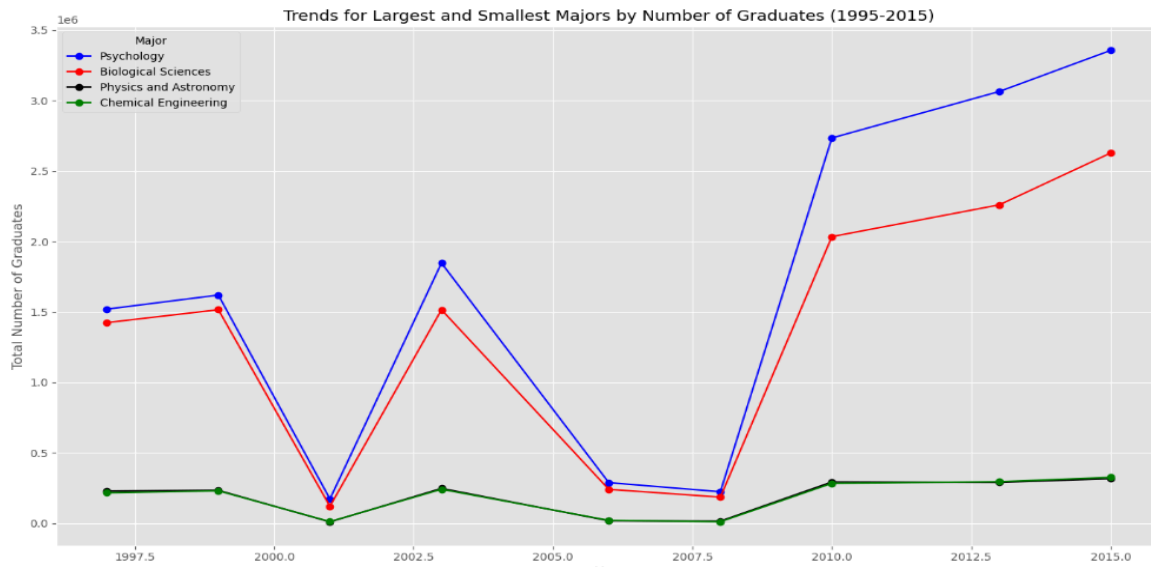
The percent change in average mean salary from 1995 to 2015 is +55.81 %



The average salary across all majors has shown a consistent upward trend over the past 20 years. However, there have been occasional declines in salaries, attributed to economic downturns in the United States. These downturns may have led to a tighter job market, increasing competition and subsequently lowering overall financial returns. During periods of

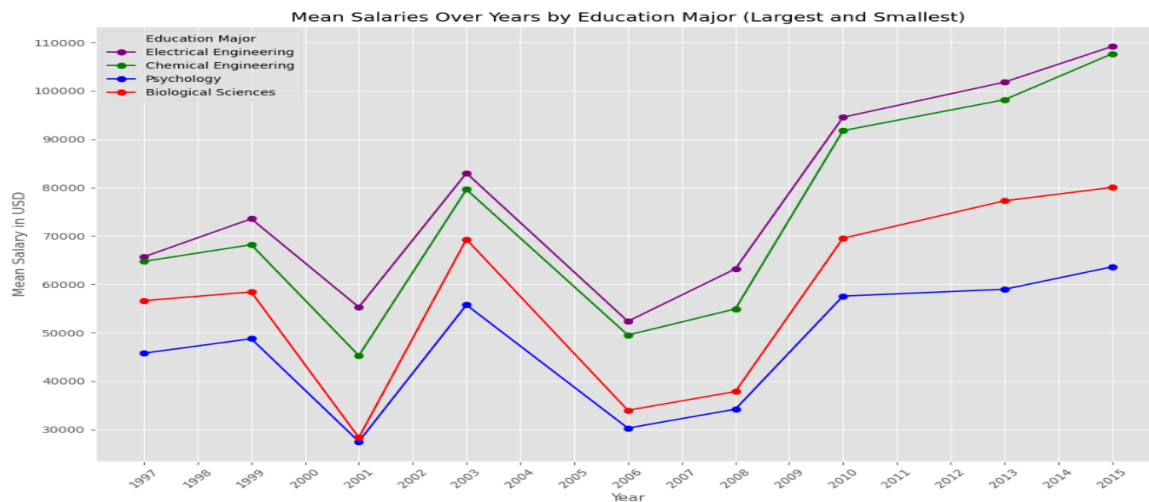
instability, graduates might have faced lower starting salaries as they accepted any available positions within their field.

Which majors had the largest number of graduates and smallest number of graduates?



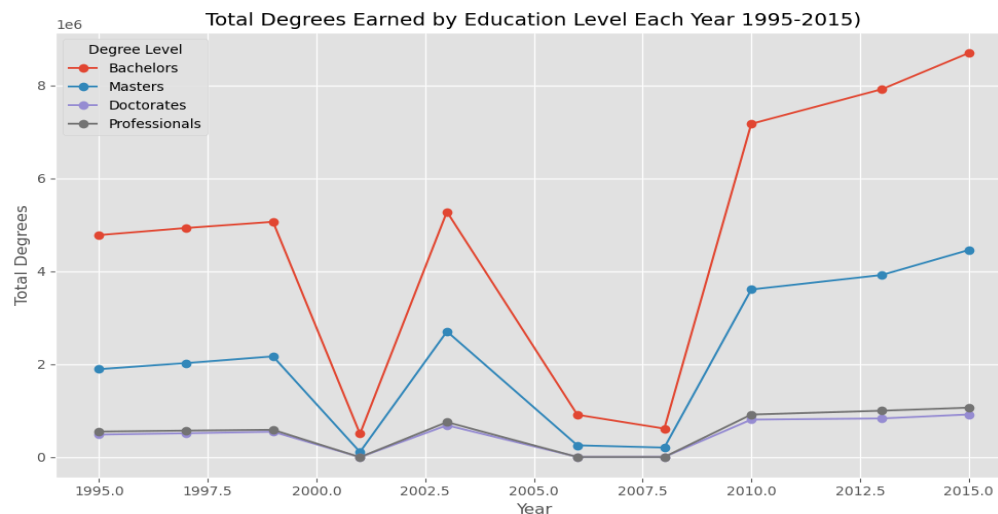
Psychology and Biological Sciences consistently produce the largest number of graduates due to the popularity of the majors. These fields have mirrored the economic trends, the job market paralleling periods of economic growth and decline. Conversely Physics and Astronomy as well as Chemical engineering have consistently seen lower graduates. Factors that may contribute to this may include the perceived level of difficulty of the course work, as well as interest in the given subjects.

Which majors had the highest and lowest average salaries?



Majors that consistently reward their graduates with higher salaries are Electrical and Chemical Engineering. This can be partially attributed to the lower quantity of graduates for the respective majors. With fewer people in this field an employer may be inclined to offer a higher more competitive salary to secure qualified talent. Conversely the majors Psychology and Biological Sciences offer the lowest salaries due to their being a higher saturation of graduates, and increased competition for available positions.

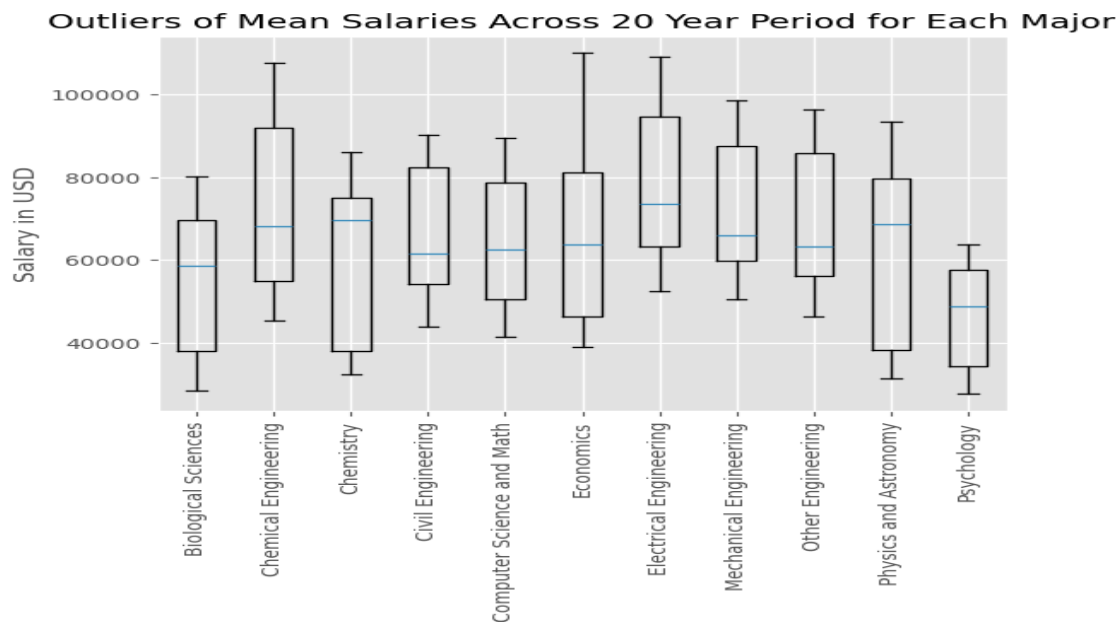
What is the distribution of degrees earned by educational level?



This portion of the analysis is focused on demonstrating, inherently, the number of types of degrees obtained without grouping by ethnicity or gender. We hope to use this visual as an

introduction for the next portions of the analysis when comparing and correlating each major degree level with mean salary. However, this information can not be overlooked as it too helps paint a picture about some basic information that is relevant towards the overall theme of our project.

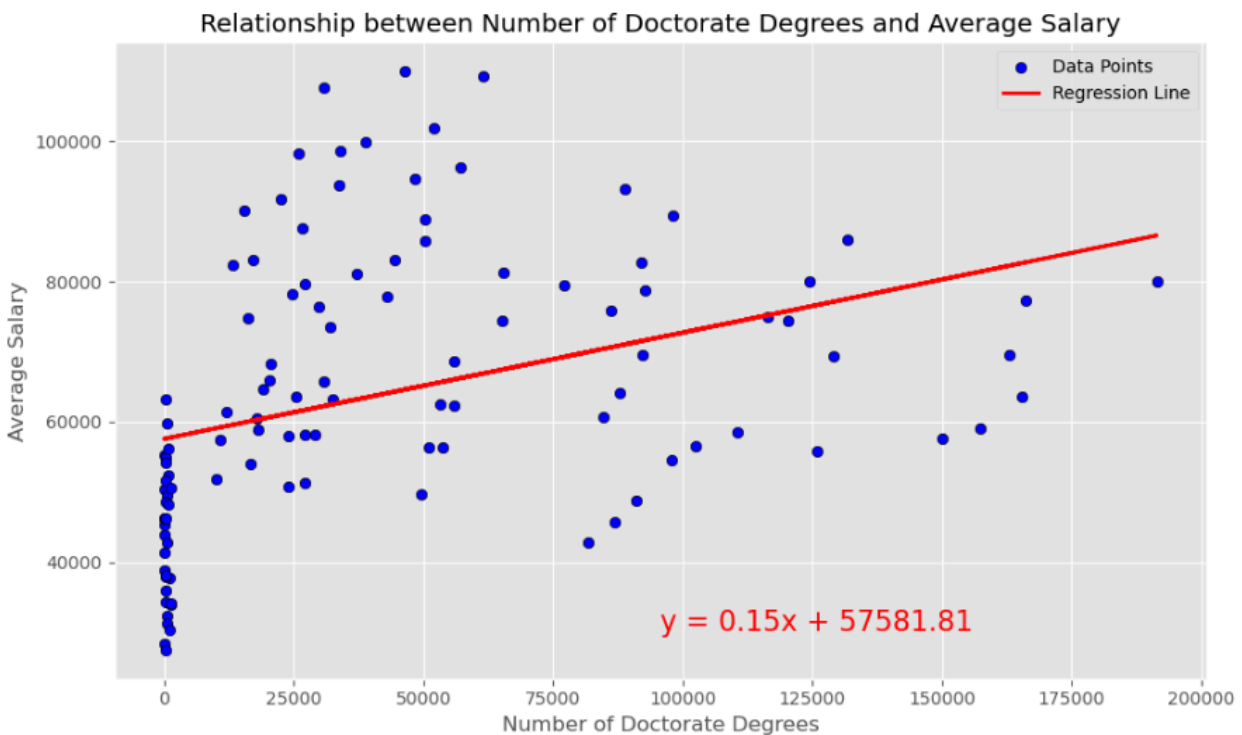
Due to the economic crashes, are there any outliers for the mean salaries of majors across the twenty year period?



As a part of our final exploratory analysis we decided to run a complex analysis based off of calculating, for every significant column in the cleaned data set, the quartiles, interquartile range, upper and lower bounds, and the presence of any possible outliers. Running the analysis led us to the conclusion that, for each major, each demographic, and each level of degree obtained, there were no values that were statistically significant enough to be considered outliers. It was intriguing to us that even through the clearly defined moments of economic downturn that there was no significant change in the base salaries, quantity of degrees awarded for each demographic, and for the quantity of types of degrees reached.

Which level of degree had the highest correlation between number of degrees awarded and average salary?

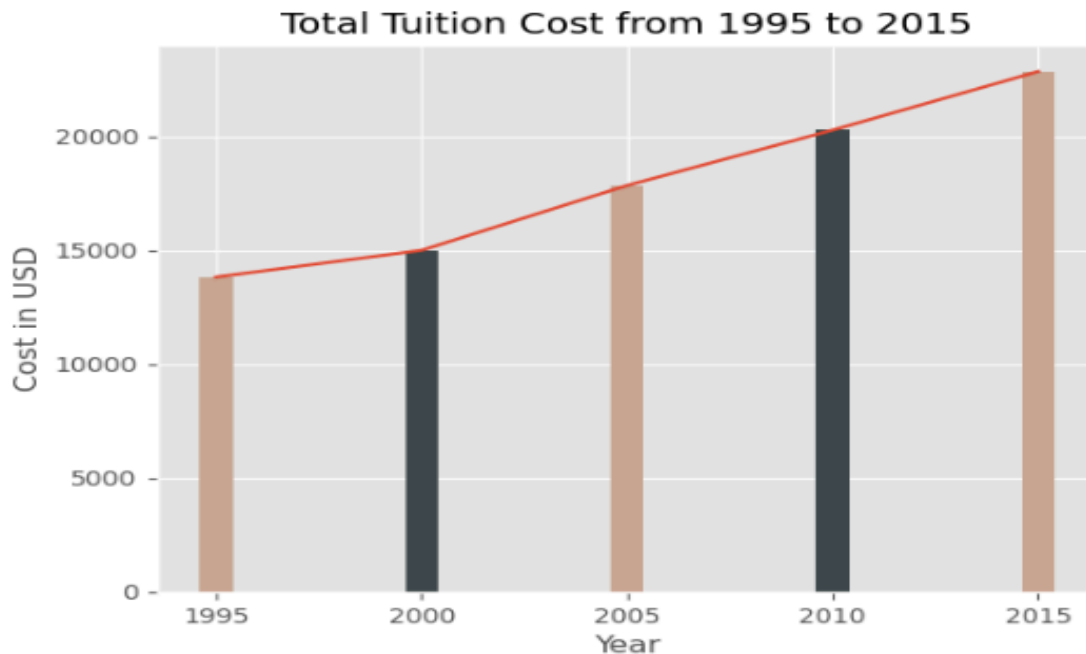
Correlation between the number of doctorate degrees awarded and the average salary: 0.3621135498308298



As part of our main analysis we executed a correlation test for each level of degree, bachelors, masters, doctorates, and professionals, and were interested in the number of degrees obtained and the mean salary. Using Matplotlib and scipy.stats we ran the four correlations and plotted them on a scatter plot, along with the equation and regression line. We decided to isolate the graph with the strongest correlation, which happened to be the one corresponding to doctorate degrees, as it appears that getting a doctorate degree is the safest way to achieve financial stability and is the best return on your investment.

How has tuition cost changed over the years?

The percent change in cost of total tuition from 1995 to 2015 is +39.52 %



Tuition costs have had a gradual increase over the years. After looking at a 20 year period divided amongst every 5 years, we can see it has had a linear growth. After calculating the percent change, there was about a 40% increase for all types of institutions' costs throughout the 20 year period. Which compares to the trend line of the average mean salary chart, fortunately average mean salary kept up with the cost of tuition. Meaning that in comparison to total tuition cost change, it is still moderately worth it to receive an education considering the pay out keeps up with the cost.

Conclusion:

After countless hours of data exploration, wrangling, manipulation, visualization, and analysis we hope to have formulated some insight into the socioeconomics behind the college experiment and whether or not the return is worth your time, money, and commitment. From the data obtained a clear picture was drawn for which majors had the highest average salaries, which degree levels grossed higher salaries, differences on genders in degrees earned, and even ethnic diversity across college degrees earned. The conclusion we came to is that by 2015, it was still beneficial to pursue a degree, especially in less populated majors such as chemical or electrical engineering. Future outlooks would include comparing this dataset to that of one with the same information for 2018 to 2024. In today's time there are many different methods for receiving jobs

which don't require an actual four-year degree, such as boot camps or training programs for specific jobs. New markets such as social media don't require a degree as many people are shifting from school being a priority for future financial security.