

DS202 Final Report:

College Admissions

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I. Introduction

Universities and colleges have ensured the diversity and diversity of students and changed the original single admission conditions. Today's universities and colleges have long used an admission process that values the whole. Admissions staff will consider students' high school grades, religious beliefs, essay level, recommendation letter content, activities to participate, athletic ability, and ability to pay tuition. When considering multiple conditions, we can fully understand the situation of the students. SAT scores have also become a condition that candidates and schools pay more attention to. We hope to explore through this project what factors are related to the admission of the university.

II. Data

Our raw data is available from

<https://www.kaggle.com/sumithbhongale/american-university-data-ipeds-dataset/home>.

This dataset comes from the national center for education statistics, particularly the IPEDS (Integrated Postsecondary Education Data System). There are 1534 rows, and 145 columns in the dataset.

III. Problems

A brief plan for exploratory analysis: What questions can be answered from the dataset?

1. Do some institutions disproportionately weigh ACT score over SAT score for admissions or vice versa?
2. How does the size of the institution correspond to total tuition and fees?
3. Do different religious beliefs affect the enrollment rate of college students?
4. How does the total price of in-state and out-of-state living on campus in different regions affect the enrollment rate?

5. How are SAT scores distributed and affect the enrollment rate of college students?
6. How is estimated freshman enrollment distributed for full-time students?
7. What kind of correlation is there between the zip code of the school and the percentage of financial aid they give?
8. How do the percentages of incoming freshmen submitting SAT scores affect the admission total?

IV. Experiments & Evaluation(plots and analysis)

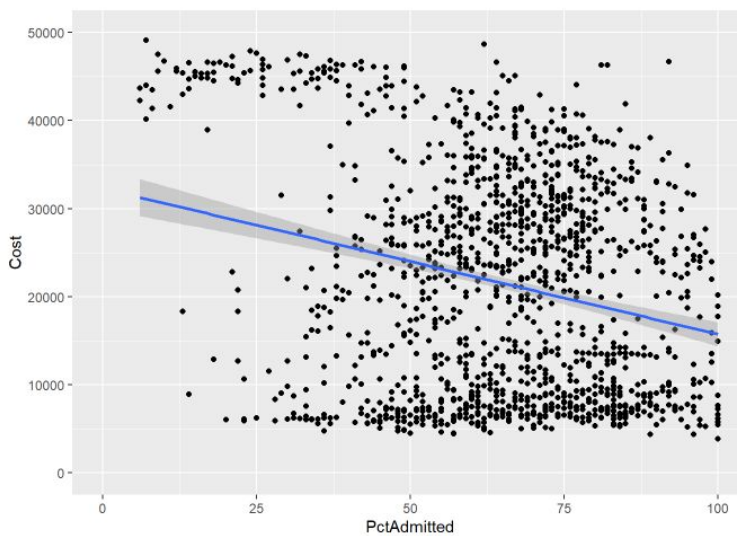
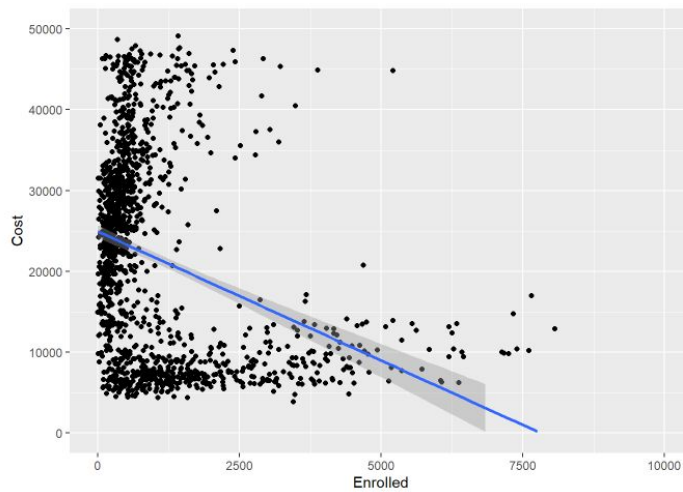
1. Do some institutions disproportionately weigh ACT score over SAT score for admissions or vice versa?

From our IPEDS data set, we learned that institutions in general do not disproportionately weigh SAT scores over ACT scores. However, when looking at specific schools, there is a bias toward SAT scores. Therefore, in a broad sense, schools in general don't favor any tests over another with a few outliers.

Schools with relatively low SAT scores		Schools with relatively low ACT scores	
School	<u>ACTBias</u>	School	<u>ACTBias</u>
Aquinas College	-0.19548611	California University of Pennsylvania	0.07465278
Hendrix College	-0.10347222	Southwestern Christian University	0.07048611
Prescott College	-0.10138889	Elon University	0.05486111
Doane College-Crete	-0.09756944	Huston-Tillotson University	0.04027778
Vanguard University of Southern California	-0.09305556	Curry College	0.03854167
Tabor College	-0.09166667	Wesleyan College	0.03802083
Wartburg College	-0.09131944	Toccoa Falls College	0.03541667
Luther College	-0.08857639	Adelphi University	0.03402778
Huntington University	-0.08645833	Judson College	0.03402778
Butler University	-0.08368056	Mount St Mary's University	0.03368056

2. How does the size of the institution correspond to total tuition and fees?

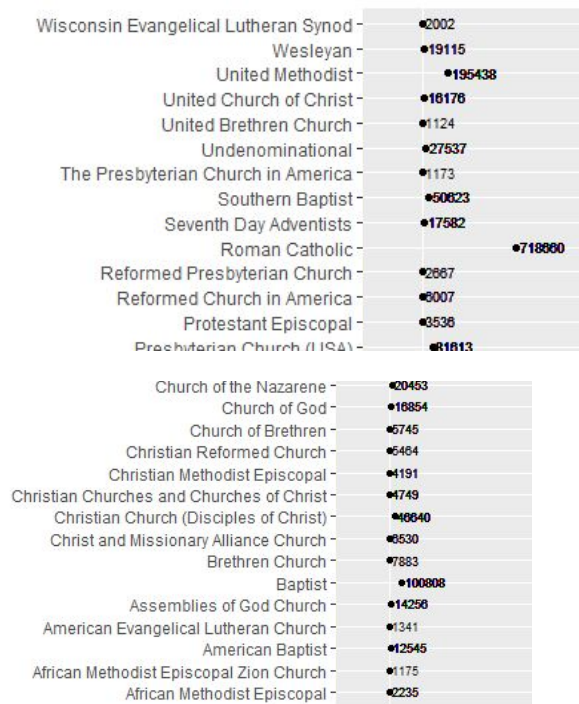
From our data and graphs, we learned that schools with higher enrollment rates generally tend to have lower costs. However, there are a lot of schools that have large enrollments with a low cost. Furthermore, we also learned that more prestigious schools had a lower enrollment with much higher costs proving that the size and tuition have a correlation with each other.



3. Do different religious beliefs affect the enrollment rate of college students?

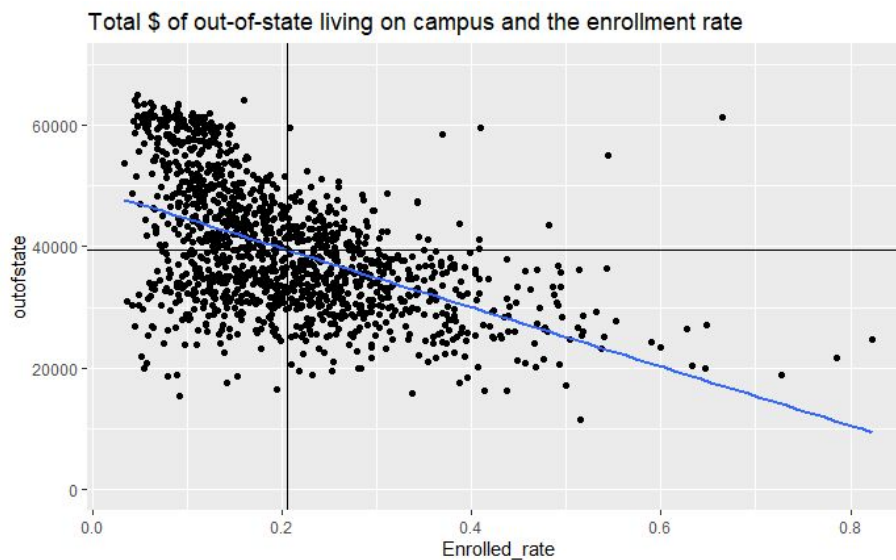
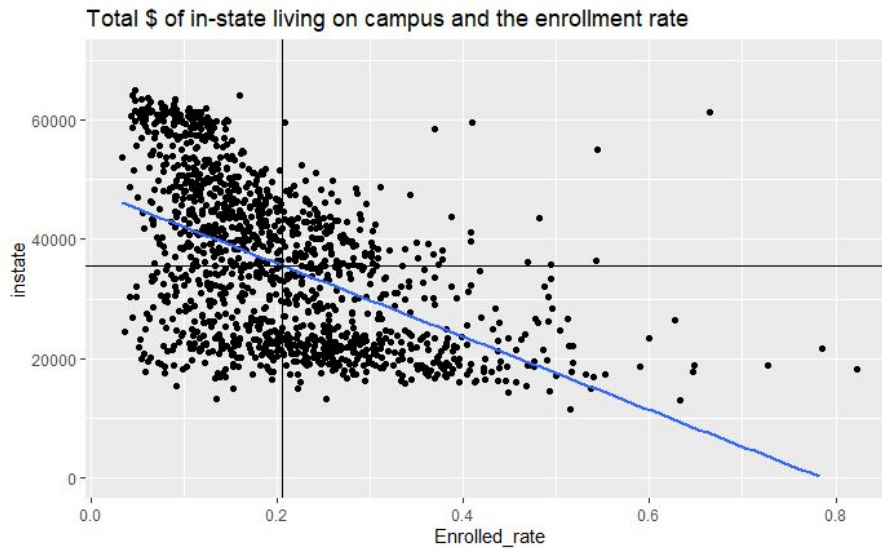
When looking at the data, and trying to compare or correlate if religion affects the enrollment rate, it can be drawn that the amount of people that enrolled and their religion

is positively correlated. From the graphics, it is shown that 718,660 of the freshman enrolled are Roman Catholic. The second most common religion is United Methodist at 195,438 people. The difference between these religions is roughly 368%.



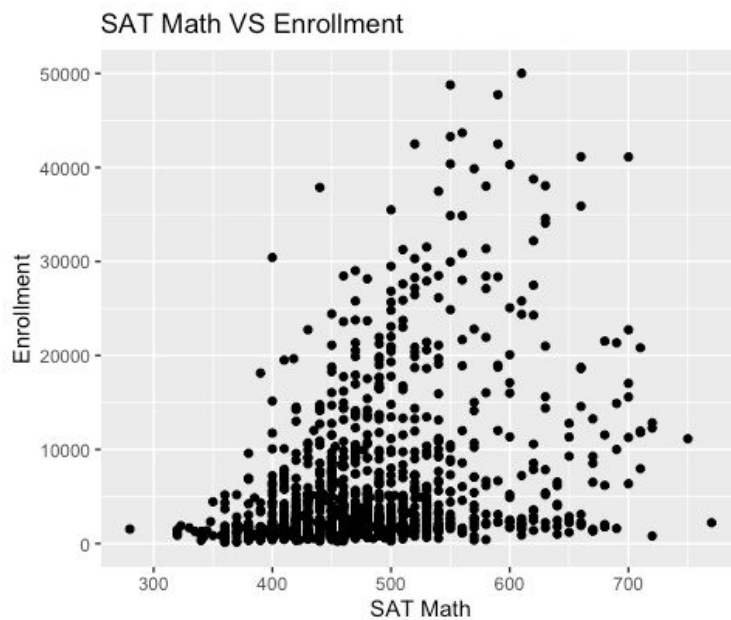
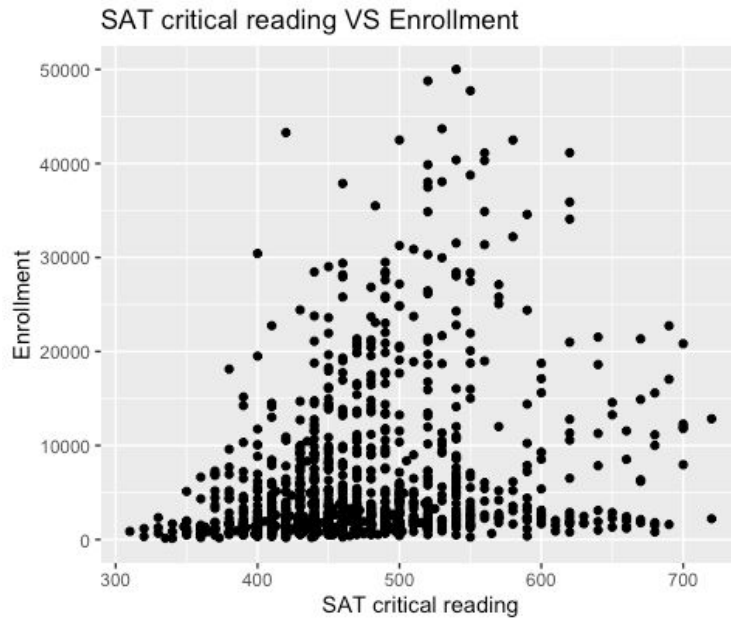
- How does the total price of in-state and out-of-state living on campus in different regions affect the enrollment rate?

When comparing the costs of in-state and out of state tuitions, there is an obvious sign that in-state costs of an institution are less than that of the out-of-state. But as in-state and out-of-state cost rise, the enrollment number decrease.



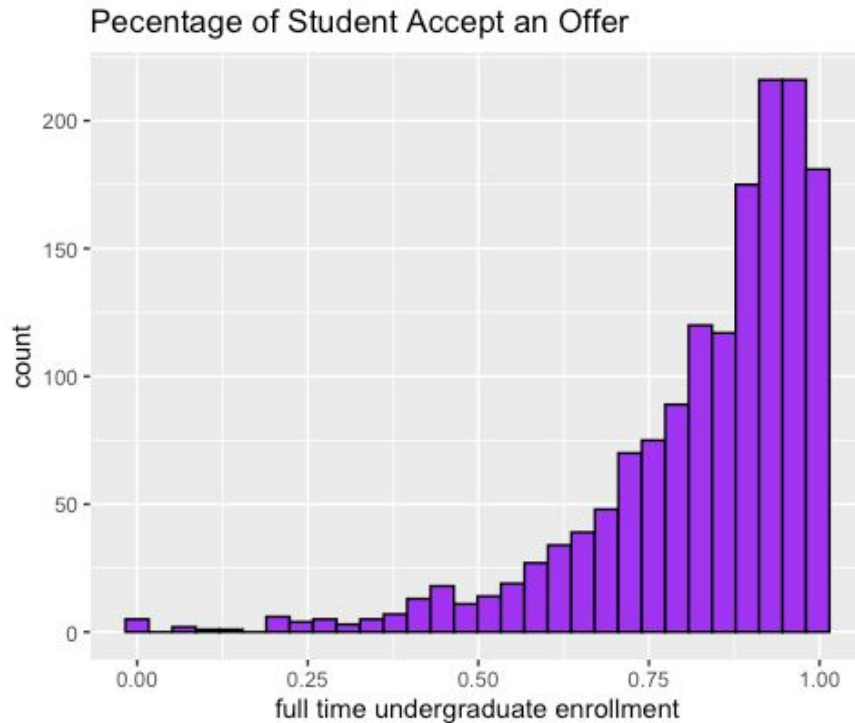
5. How are SAT scores distributed and affect the enrollment rate of college students?

We learned that in the scatter plot(SAT against enrollment), for critical reading, the peak values are between 500 and 600; for math, the peak values are between 600 and 700. The results demonstrated that universities and colleges prefer students who have these ranges of scores for SAT tests with higher acceptance rate. Thus, it could be a reference or a goal when students choose to take SAT tests.



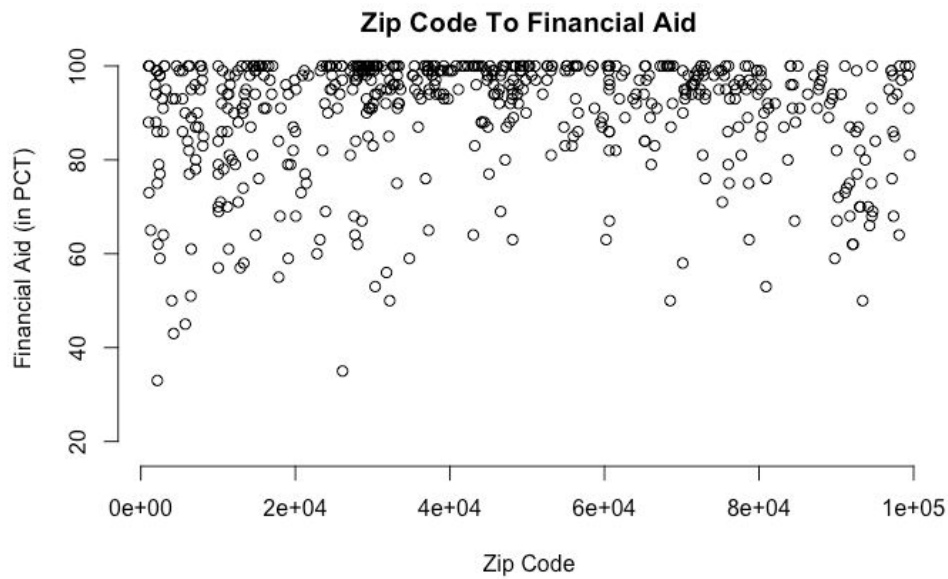
6. How is estimated freshman enrollment distributed for full-time students?

We learned that in the histogram, the distribution is left skewed. Most students have an enrollment rate of between 0.75 and 1, which means that most students accept offers after receiving them. The results are what the admission office wants to see since the admission office sends desired offers to the right students who really match the universities or colleges characteristics.



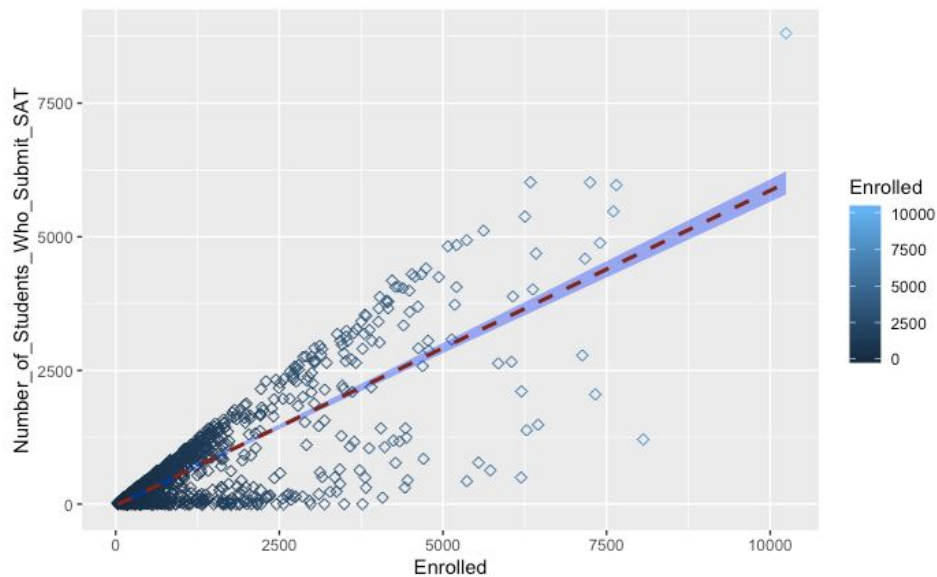
7. What kind of correlation is there between the zip code of the school and the percentage of financial aid they give?

What we learned is that zip code doesn't have much correlation to the amount Financial aid that was given to students. Infact , when we looked at the data itself, we quickly learned that the points are very scattered with some schools giving up to 100% of their freshman body financial aid while other schools only provided roughly 18% of their incoming freshman body financial aid.



8. How do the percentages of incoming freshmen submitting SAT scores affect the admission total?

When we were looking at the correlation between SAT scores and admission total, there was a positive correlation that as the student body for the freshman increased, so did the amount of people applying with SAT scores.



V. Conclusion & Discussion

Based on the data, we were able to draw conclusions about most of our questions as described in section IV. The main takeaways are that schools generally don't favor ACT over SAT (or vice versa), larger schools trend to lower cost, more exclusivity trends to higher cost, certain institutions have high enrollment of certain religions, and in-state tuition costs less than out of state. For question 7 we did not find a connection between zip code and financial aid, and in question 8 we found a positive correlation between enrolled students and the number of students submitting SAT scores. Overall, we were expecting to have stronger correlation for things like enrolled and pctAdmitted vs cost, but we only found a weak correlation. This is most likely because our dataset contains a very broad range of schools in the United States, and our expectations about college admissions are based mostly on larger schools such as Iowa State. Because our data set contains schools of many different locations and sizes, our results are more scattered than one might expect.