Project 1:
Standardized Test Analysis

University Admissions Guide

Background

The university application process is a challenging and time consuming one with many components to consider:

- Admission tests
- Referral/Cover Letters
- Interviews
- ...

Admission tests are arguable the biggest hurdle for most prospective students, with an entire industry of educators specializing in such tests.

There are many such admissions tests for universities in different regions. For this analysis, we will be looking at SAT and ACT scores.

Problem Statement

How can we optimize for the best chance of gaining admission to the best possible university?
For this, we will look at two factors

- Which state to start pre-tertiary education in?
- Which admission test to focus on?

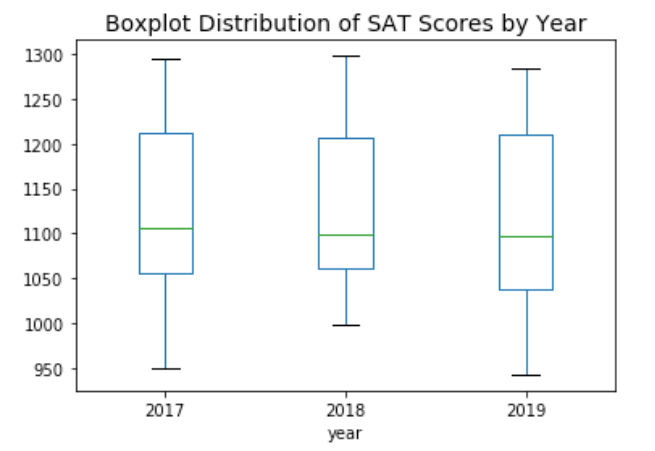
Assumptions

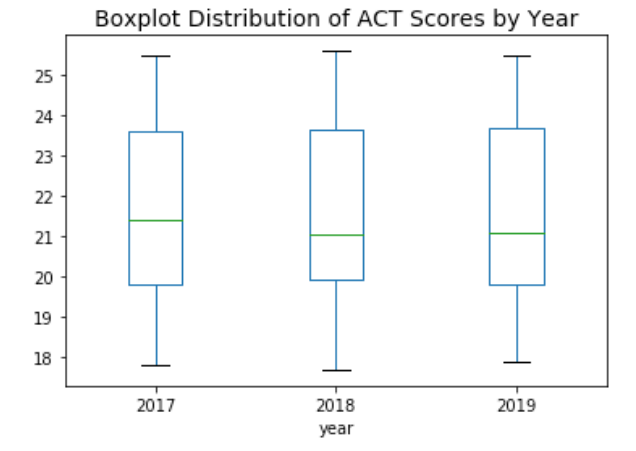
- State test scores are a proxy for the quality of education
- Consider only the average student (do not account for other factors like parent's education, household income, etc.)

Average test scores have fallen between 2017-19

Making it all the more important to optimize for admissions tests

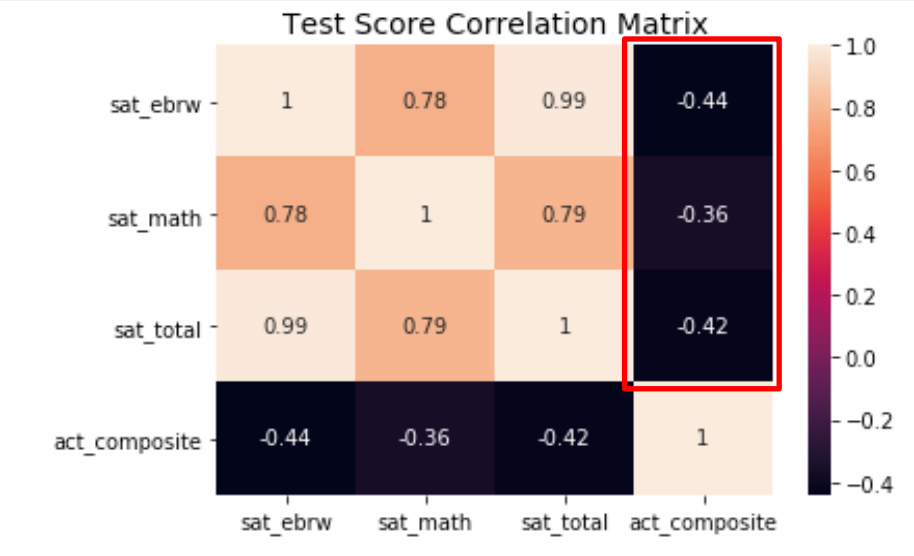
year	sat_total	sat_participation	act_composite	act_participation
2017	1126.098039	0.398039	21.546000	0.652549
2018	1120.725490	0.458824	21.503922	0.612353
2019	1113.078431	0.490588	21.464706	0.586667





Negative correlation between SAT and ACT scores

Given limited time and resource, important to focus on a single admissions test



Negative correlations everywhere!

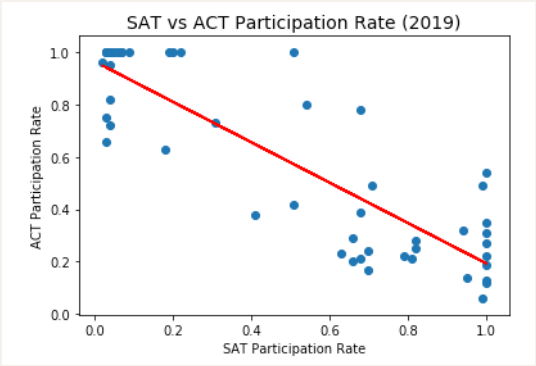
Negative correlation between SAT and ACT participation rates

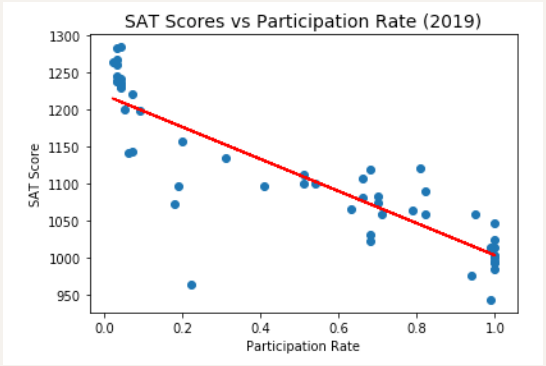
- Students are likely to take either SAT or ACT

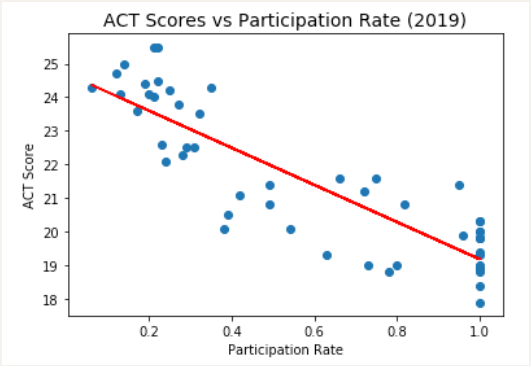
Negative correlation between test scores and participation rates

- For tests with high participation rates, students are scoring worse

Are students simply optimizing for the incorrect admissions test? Or is it the reverse?
Likely that high participation rates dilute the quality of test scores...may not be a useful explanatory variable







Findings

Average test scores have been falling across the board

- Across different states, students should enroll in pre-tertiary institutions that are most likely to produce high test scores to outperform

Negative correlation between test scores within states

- Taking both SAT and ACT will result in one underperforming test score
- Which admissions test to focus on?

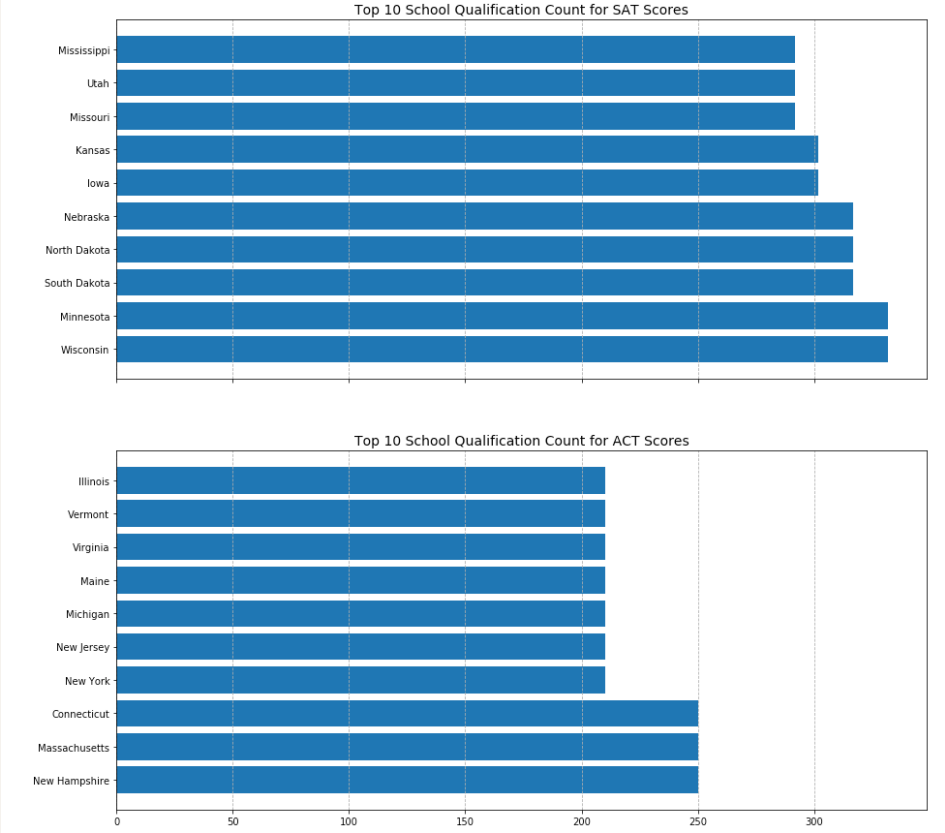
Recommendations

Based on findings, we should optimize for state and admissions test

School Qualification Count measures the number of schools where the average student meets the 25th percentile threshold (qualification criteria)

The average student should:

- Focus on the SATs
- Enroll in pre-tertiary education in one of the top 10 states (top graph)
- Assumes no mobility restrictions



Further Exploration

Extend the model to include more variables that explain the variability in test scores

- Use more insightful data – state crime rates, state education budget, state income per capita, etc.
- Allows us to create a more robust predictive model based on the state factors

End