

GA DSI Project 1

(*SAT vs ACT 2017/2018*)

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1. Overview

For our first project, we're going to take a look at aggregate SAT and ACT scores and participation rates from each state in the United States. We'll seek to identify trends in the data and combine our data analysis with outside research to identify likely factors influencing participation rates and scores in various states.

2. Summary of Dataset

The datasets we will be working with gives us the various test scores and the *participation rates* broken down by the *various US states* by the respective years.



3. Problem Statement

Here's a specific prompt which we will be basing on to craft our problem statement:

The new format for the SAT was released in March 2016. As an employee of the College Board - the organization that administers the SAT - you are a part of a team that tracks statewide participation and recommends where money is best spent to improve SAT participation rates. Your presentation and report should be geared toward non-technical executives with the College Board and you will use the provided data and outside research to make recommendations about how the College Board might work to increase the participation rate in a state of your choice.

Our Problem Statement:

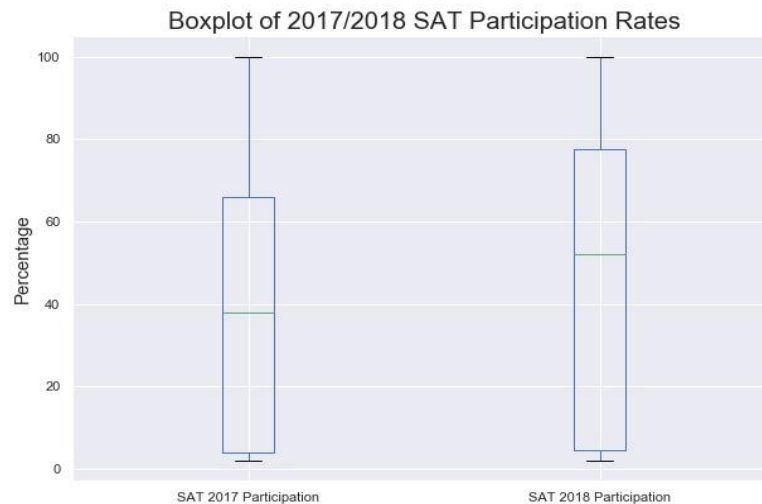
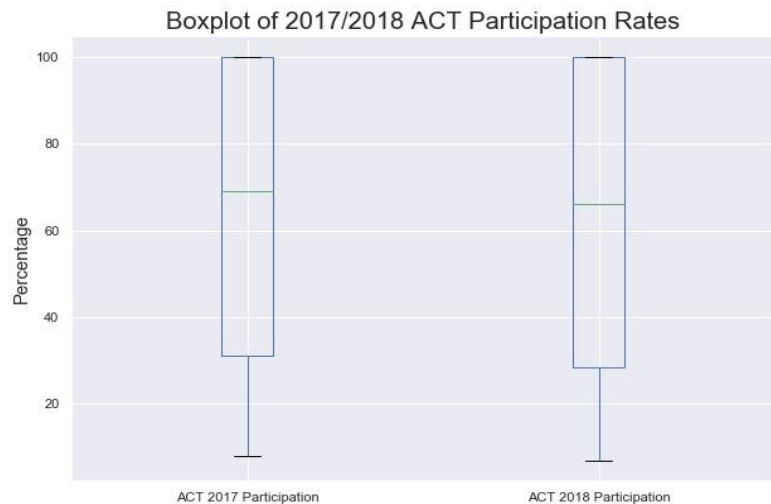
- I. Based on the dataset given, can we draw any conclusions as to how we can improve the SAT participation rates?
- II. If not, what else would we need to focus on to draw relevant insights?



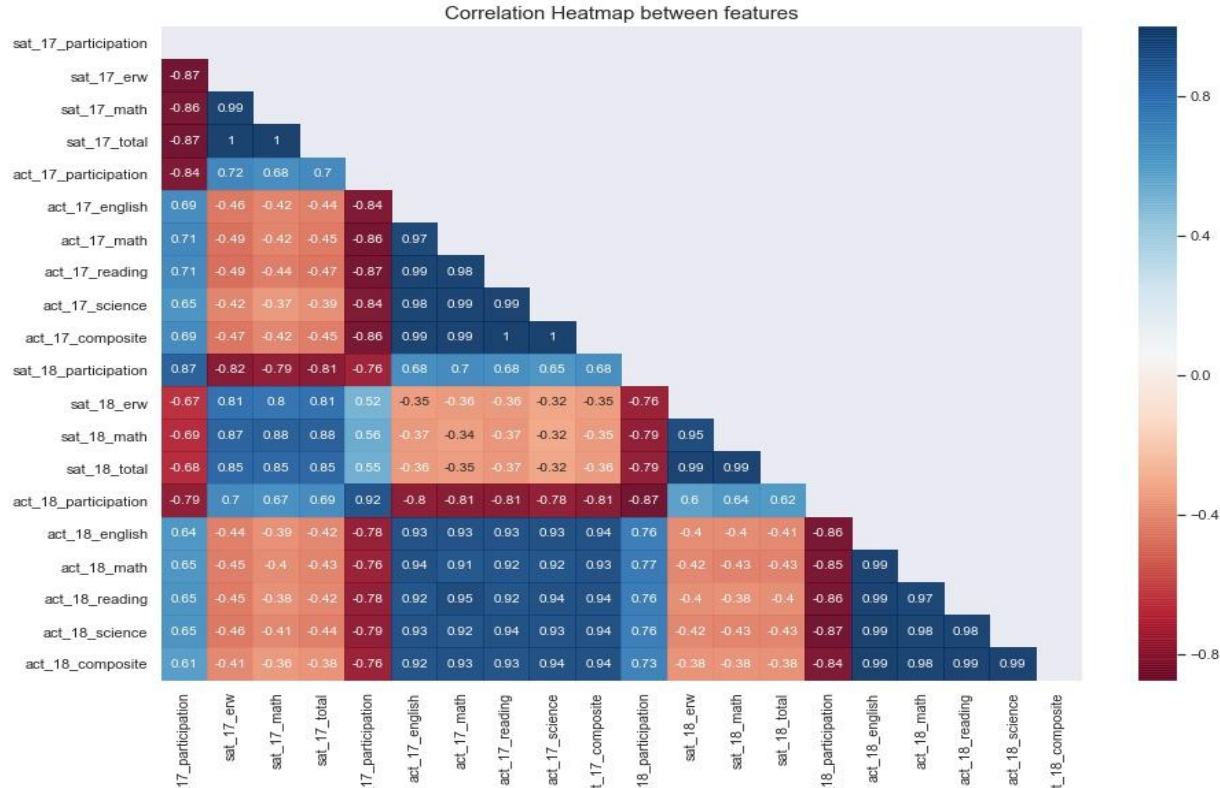
4. Executive Summary

a. General Trend

Generally across 2017 to 2018, there seem to be a general increase in median participation rate for SAT & a corresponding decrease for ACT



b. Feature Correlation



From the correlation analysis, we can conclude the following points:

- Within SAT & ACT, scores are positively correlated to each other
- Participation for SAT is correlated to the scores of ACT, vice versa
- Participation rates are inversely correlated to their own scores

Comments on Feature Correlation:

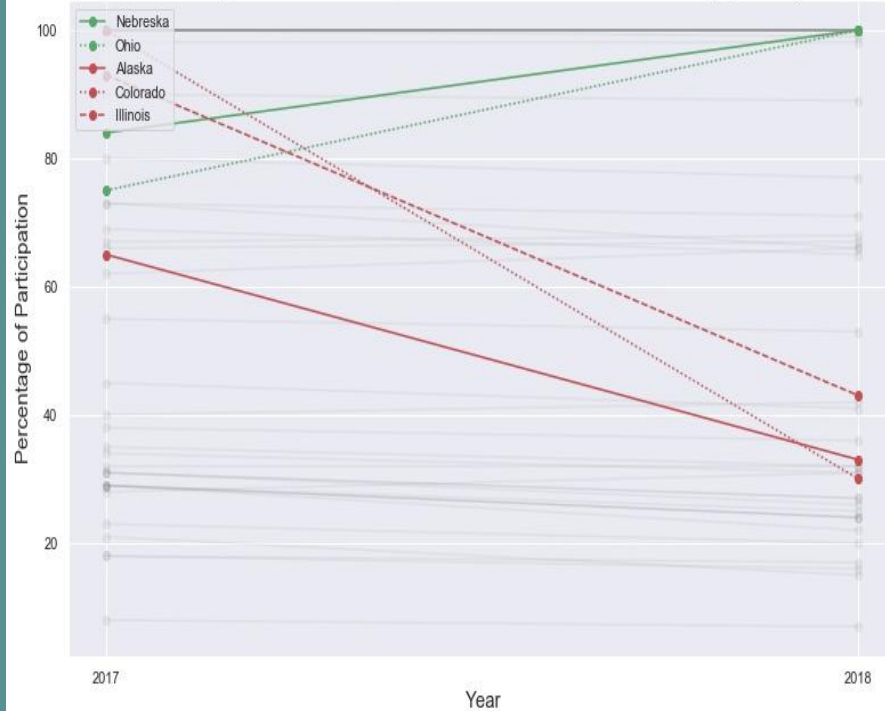
1. **Scores vs Participation Rates:** The scores of the individual tests, tho seemingly having a correlation with the participation rates (in this dataset), is not sufficient to conclude a concrete pattern.

Based on the data exploration, the scores of the individual tests seem to be inversely correlated to the participation rates. However on further research, we do realize that for alot of cases where there are high participation rates, it is usually due to either a state ruling on compulsory taking of the exam or state funded exams. This could very well lead to the lowering of the average scores based on the simple logic that student (weak or strong) is 'forced' or given a free chance to take the exams regardless of whether they are ready for it or not. Whereas if the exams were not compulsory or free, a student might not take it if he or she is not ready.

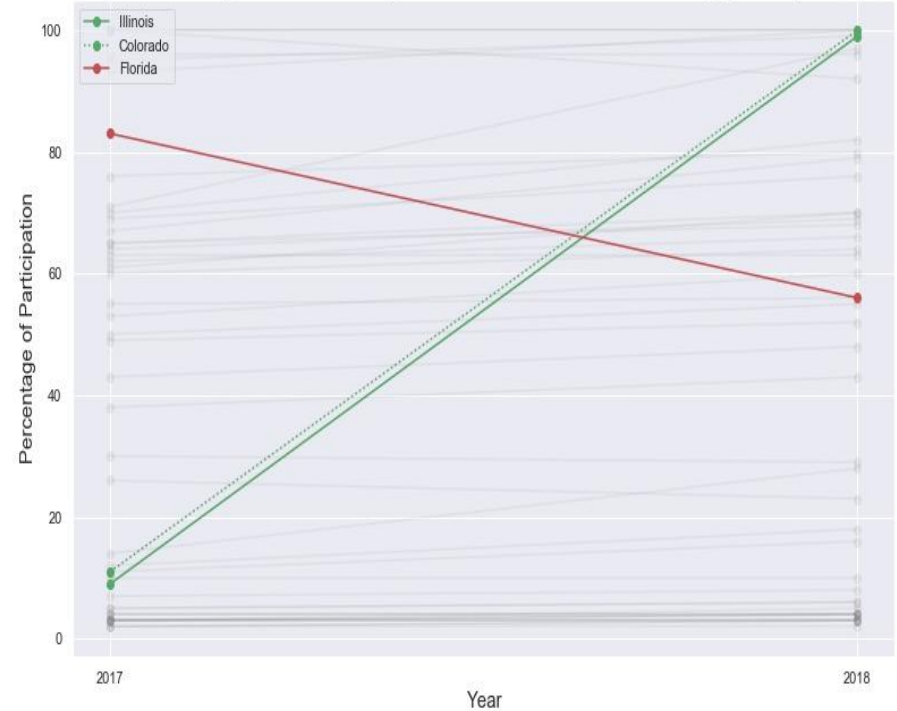
2. **Participation Rates between ACT & SAT:** Participation rates between the 2 tests seem to be inversely correlated. Which makes sense considering that are competitors by nature (majority of students do not take both the tests)

c. Significant Changes in Participation Rates for both SAT & ACT

Change of ACT Participation rates from 2017 to 2018 (by state)



Change of SAT Participation rates from 2017 to 2018 (by state)





We can identify a few states of interest (namely those in color) for the reason of:

- a) Drastic positive or negative change in participation rates over 2017 & 2018
- b) A drastic change negative change in one test & a drastic positive change in the other test over 2017 & 2018 (Colorado & Illinois)

Understanding the significant changes in participation rates:

- Generally the increase in the participation rates of a test is due to either: **injection of state funding** for the tests or **introduction of a new consensus/legislation** which required all students of the state to take the tests
- The drastic drop in the participation rates of a test is generally due to: **preference in the use of state funding or state legislation** for the other test

Further literature research yielded some information as to why:

Colorado, dropped from 100% ACT participation rate to 100% SAT participation rates

"Colorado high school juniors will be required to take the SAT college-entrance exam instead of the ACT starting this spring, a significant change that grew out of a competitive bidding process required by hard-fought testing reform legislation."

(<https://www.chalkbeat.org/posts/co/2015/12/23/goodbye-act-hello-sat-a-significant-change-for-colorado-high-schoolers/>)

Illinois, dropped ACT participation rate & jumped in SAT participation rates

"ISBE officials said the state-funded SAT is supposed to be given this school year — free of charge to high school juniors — though there are complications because of the state's budget standoff and other issues."

"In the summer of 2015, a new law took effect that required a college entrance exam to be included in the state testing cycle. But now, that exam will be the SAT, which will get a big boost in test participation under the College Board's new contract with Illinois."

(<https://www.chicagotribune.com/news/ct-illinois-chooses-sat-met-20160211-story.html>)



Nebraska jumped to 100% ACT

"2018 marks Nebraska's first year in which 100% of graduates (24,516) took the ACT as part of a statewide census test."

(<http://www.act.org/content/dam/act/unsecured/documents/cccr2018/Nebraska-CCCR-2018.pdf>)

Ohio jumped to 100% ACT

"Ohio scores are more difficult to compare because the Class of 2018 was the first where the state paid for all students to take the exam. That means thousands of non-college-bound students who were not tested in the past were tested last year."

(<https://www.daytondailynews.com/news/historically-low-act-scores-red-flag-for-our-country/djfx9Urp719WyEaMfykyxL/>)

4. Conclusions & Recommendations

With regards to the "preference in the use of state funding or state legislation for a competitor's test", the following quotes found online might give us insights into why the preference:

"ISBE said it weighed the attributes of both exams and decided the SAT was better aligned with standards for what students should know in Illinois."

"Though few students have taken the SAT in the past, many Illinois parents and students are well aware of the College Board's Advanced Placement courses and exams, as well as the PSAT that can qualify students for merit scholarships."

"ISBE officials said the state-funded SAT is supposed to be given this school year — free of charge to high school juniors — though there are complications because of the state's budget standoff and other issues."

(<https://www.chicagotribune.com/news/ct-illinois-chooses-sat-met-20160211-story.html>)



Concluding Insights:

The following factors seem to be influential to the preference for a specific test over the other:

- **Costs.** Giving discounts for loyal states might help keep them or help ease the funding concerns of states which have tight budgets. Having lower costs might also attract students from states which dictate a compulsory exit exam but do not specify which.
- **State dependent standards.** Presumably, the standards needed for various states might vary and by taking that into account when designing the tests might help stand out to them as a preferred choice.
- **Credibility & future influence** potential of the test when being used to apply for scholarships availability of advanced placement courses & exams. The higher the credibility & influence potential and the more available options for advanced placement courses and exams, the more it will stand out as the preferred choice.



Limitation of study:

The dataset is too limited and we are unable to concretely visualize any trends nor draw any statistical inference using only 2 year worth of data. We need more, maybe at least >30 years worth of data before we can infer anything.

Recommendations:

Assumptions: we are basing the recommendations purely based on the logical deduction of 2 years worth of data

- i. Generally SAT participation rates are on the rise and whatever we are doing currently (e.g. Advanced Placement courses/exams, etc) is making good impact. **Continue with them**
- ii. **Consider giving discounted rates** for the exams to further attract participation from the states and individuals
- iii. Focus on **tailoring** the exams to **fit the various state standards**
- iv. Conduct further studies into the following topics:
 - What are the considerations a state takes into account when deciding which test to fund or make compulsory as a legislation?
 - The same study with data from the last 30 years to help visualize trends
 - Study the impact of extra packages (i.e. Advanced Placement courses/exams) on an individual/state's decision