

Project 1: **SAT & ACT Analysis**

Problem Statement

- Analyze SAT and ACT Scores from previous years to provide Recommendations on where money can be spent to increase SAT participation rates.

Executive Summary

- How can Data Analysis help for this problem statement?

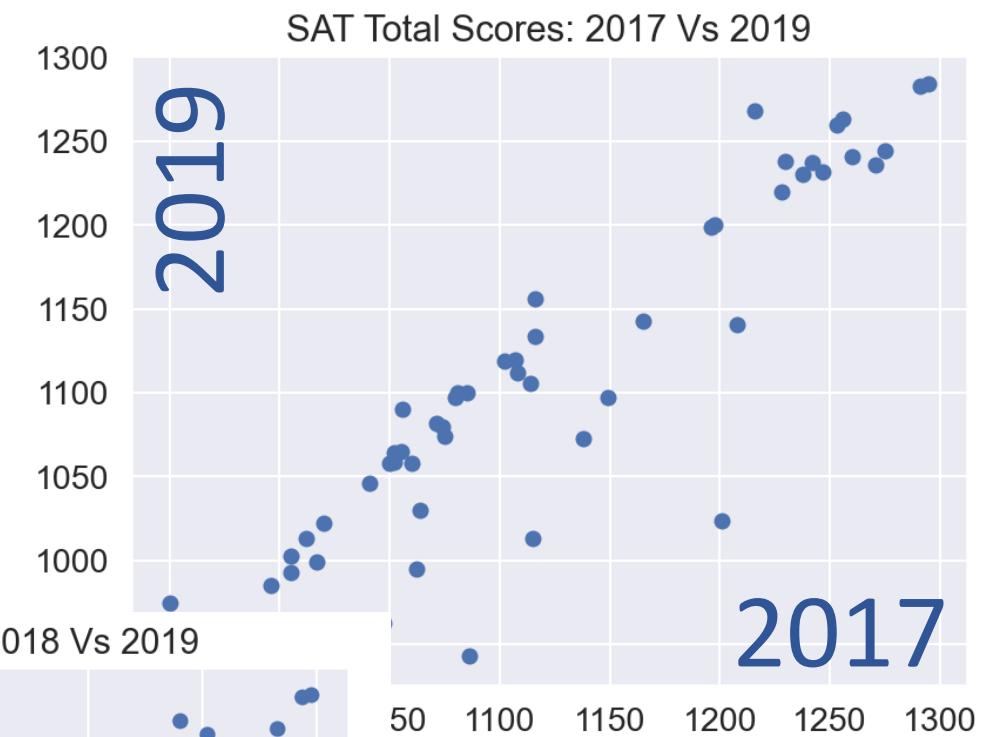
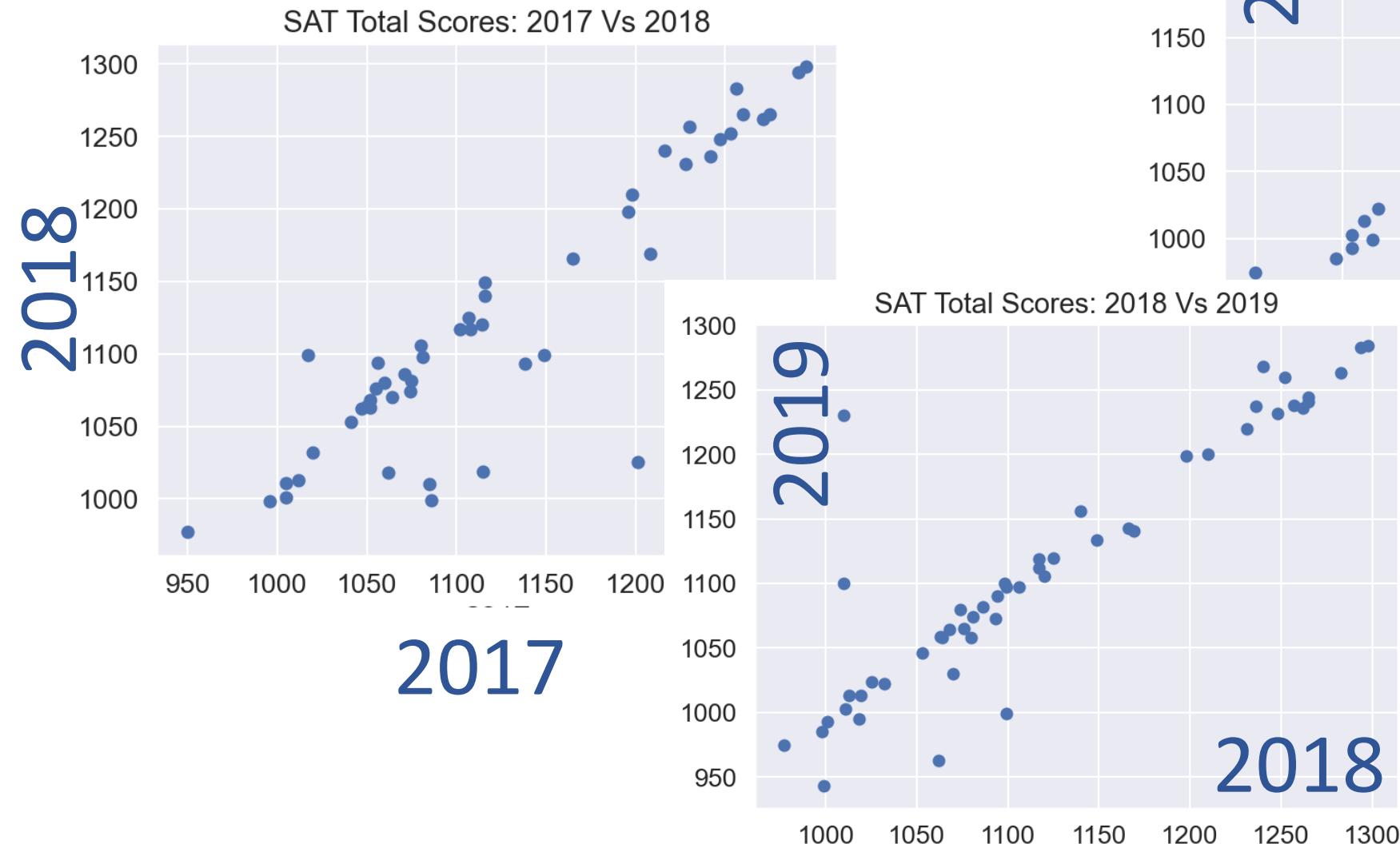
What do we have, What can be done?

- SAT and ACT data for 3 consecutive years 2017 to 2019.
- SAT – Section Scores, Total Scores, Participation %
- ACT – Section Scores, Composite Scores, Participation %

Target

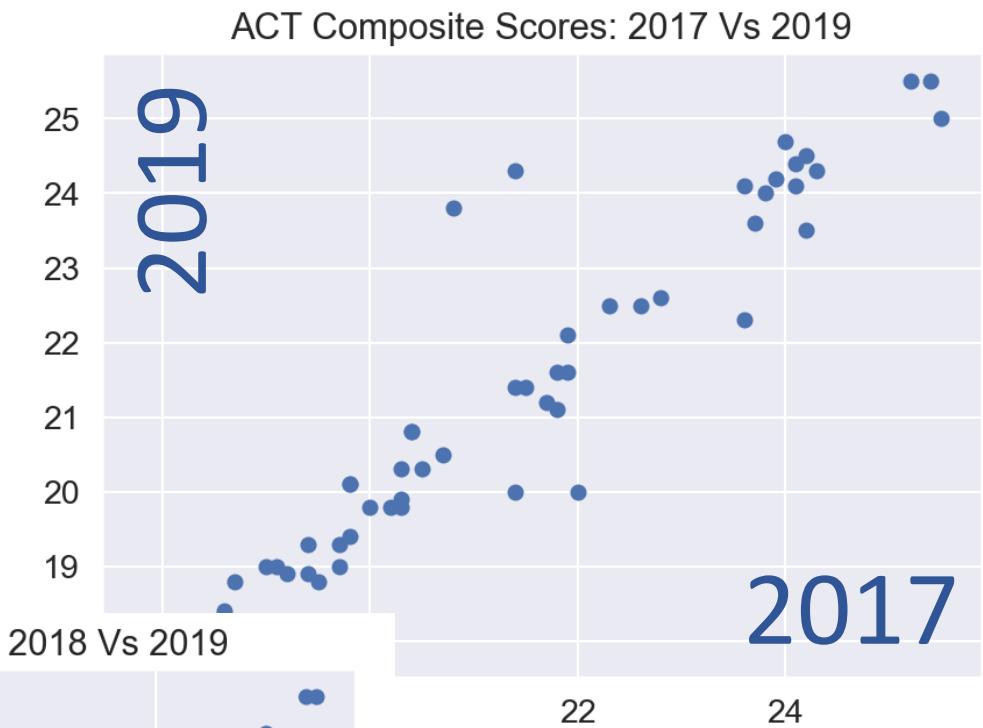
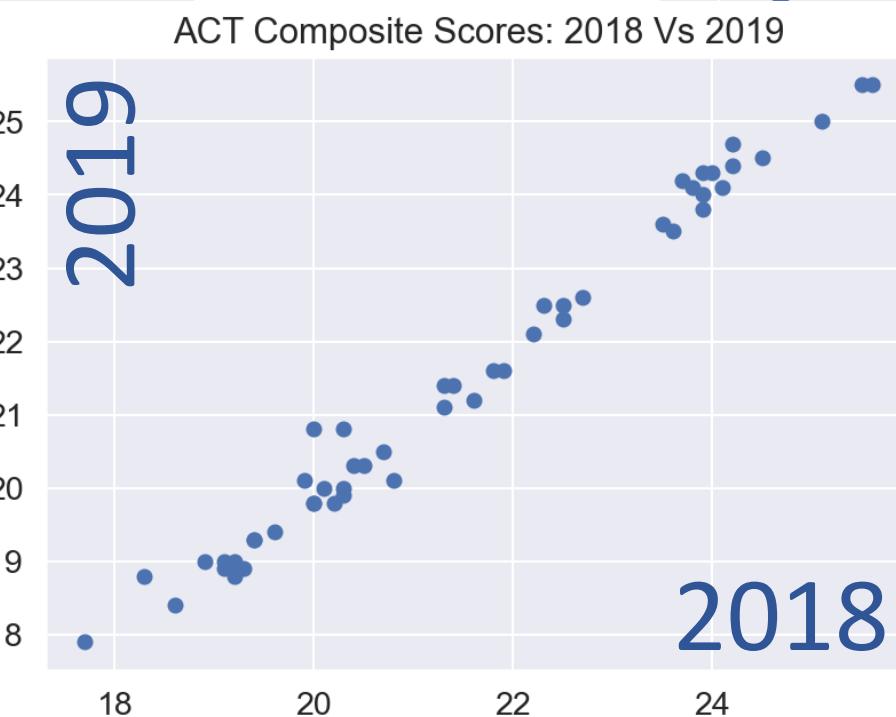
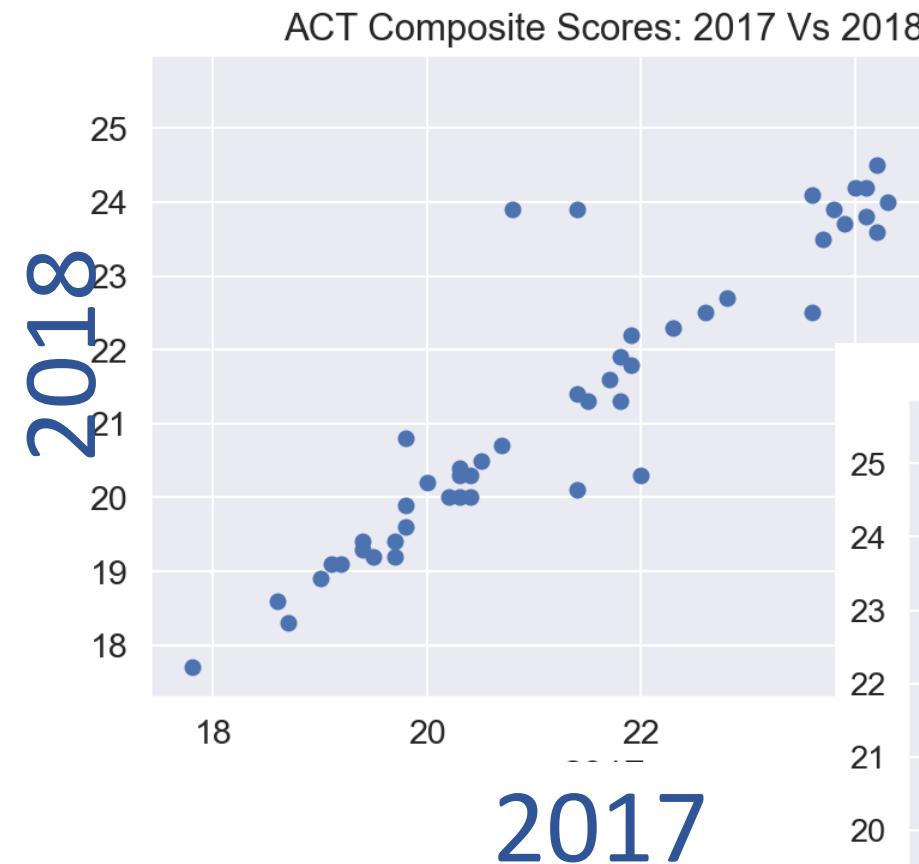
- Analyze Trends among Total Scores and Participation Rates
- Get performance insights
- Identify important correlated features that might help analyze the trend
- Conclude our findings
- Recommendations for the College Board
- What else can be done?

What's Trending! - 1



SAT Average
Total Scores
(/ 1600)

What's Trending! - 2



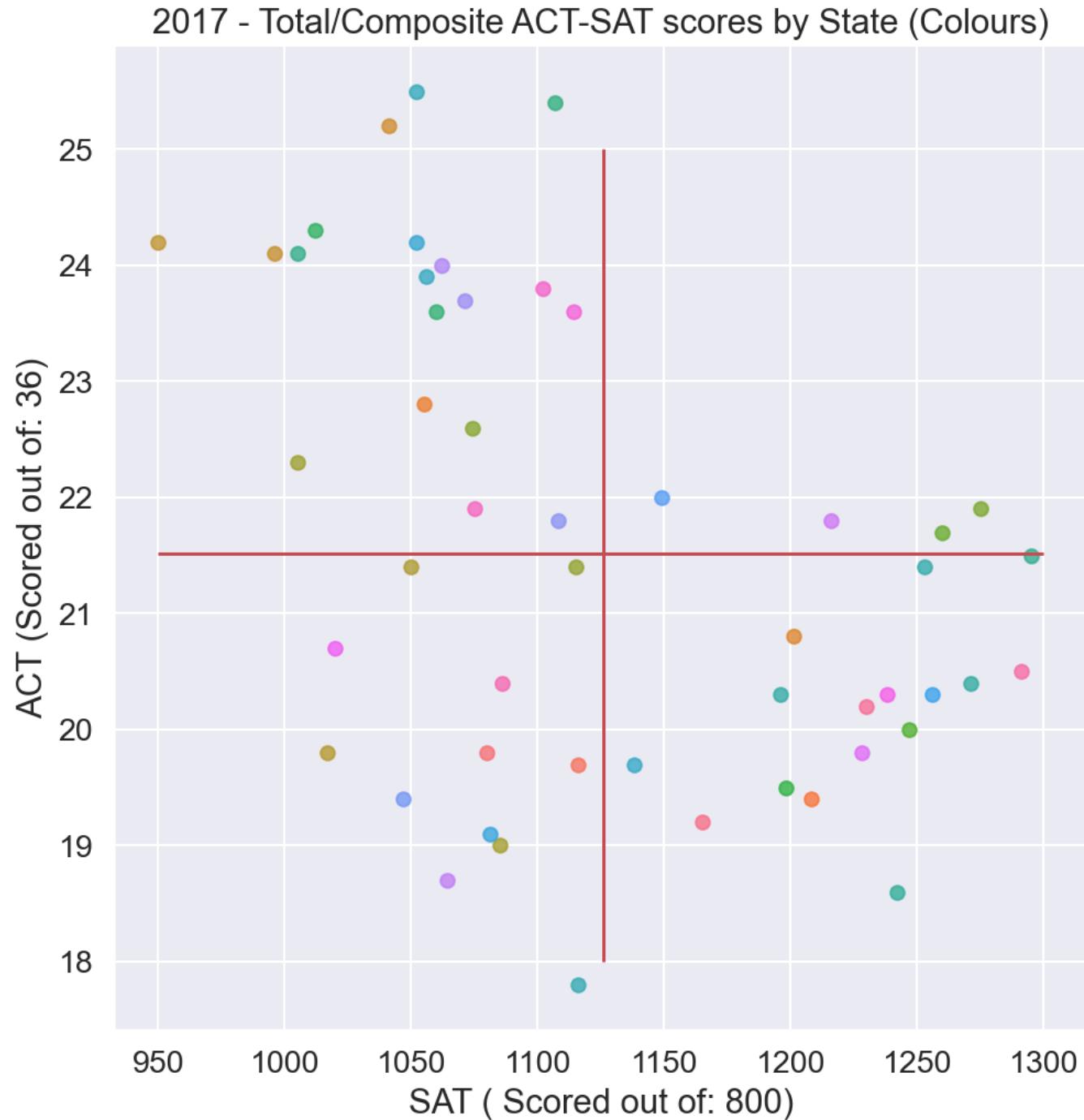
ACT Average
Total Scores
(/ 36)

What's Trending! contd.

SAT Vs ACT TOTAL
SCORE

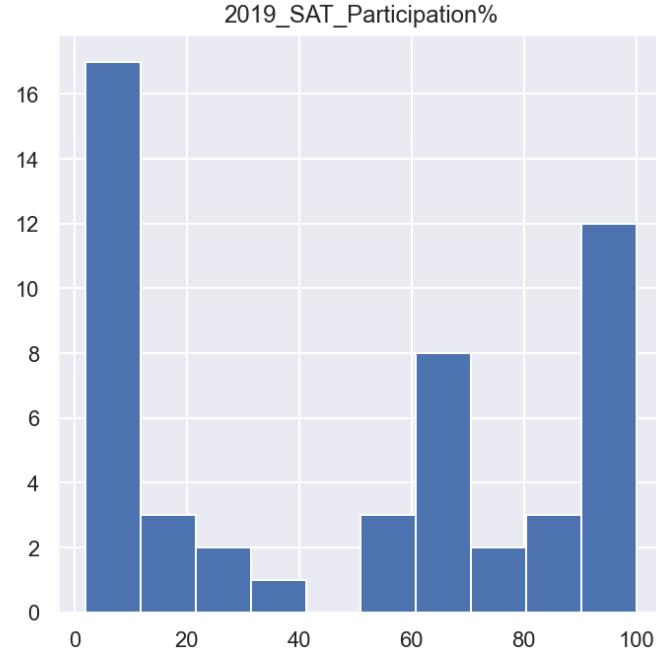
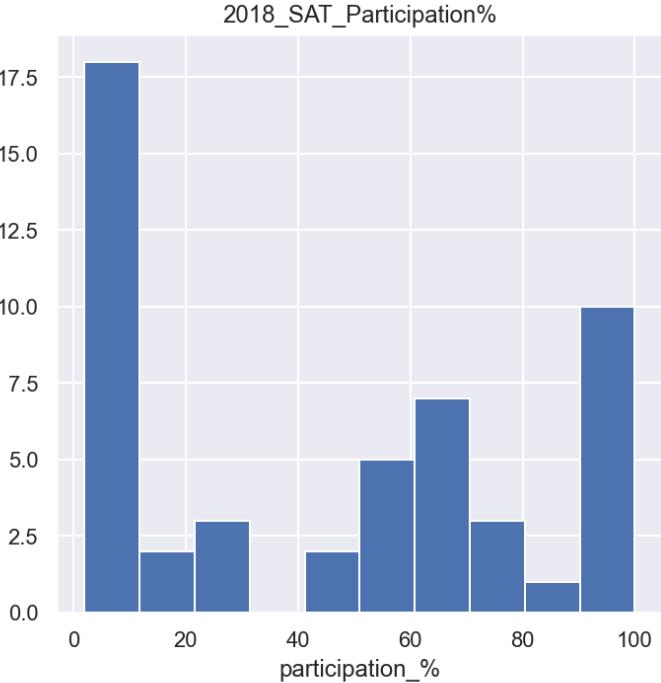
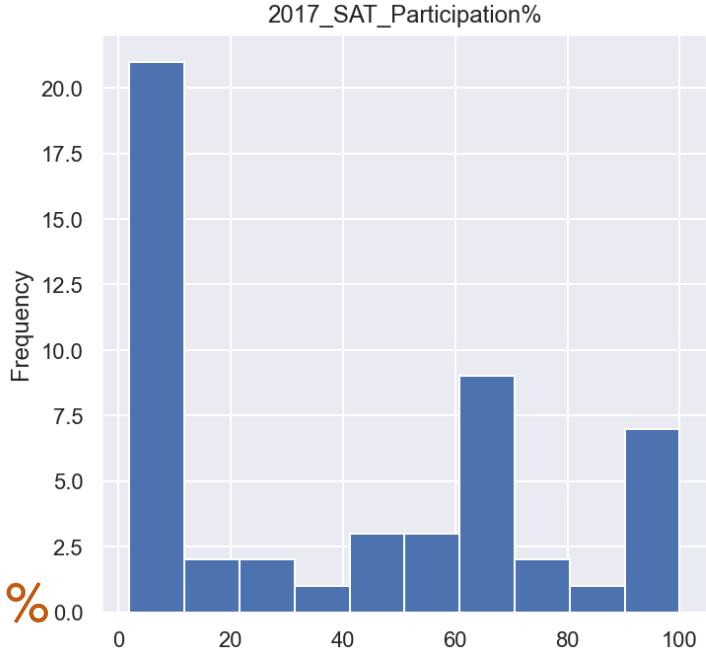
3 CLUSTERS OF
DATA (CL.)

By State



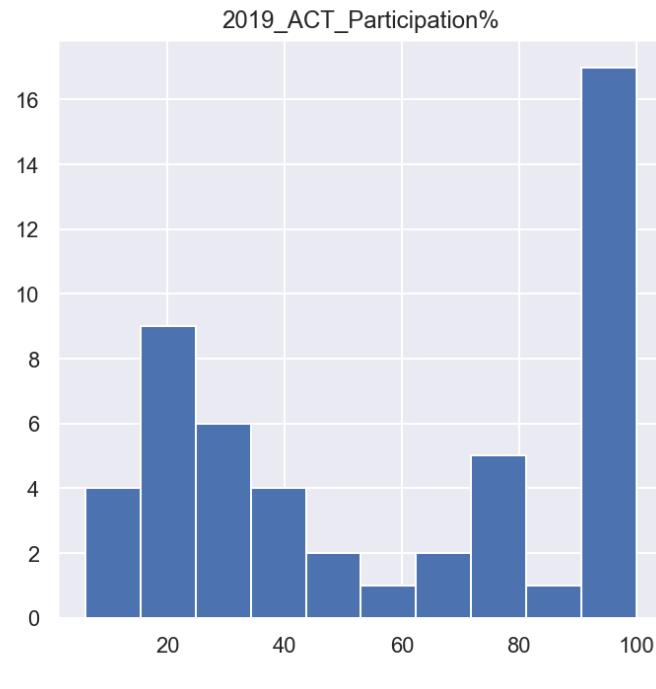
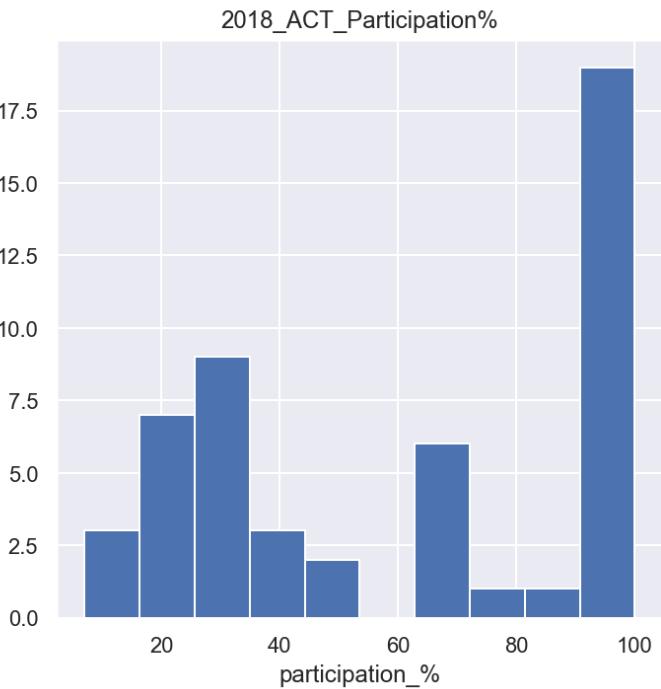
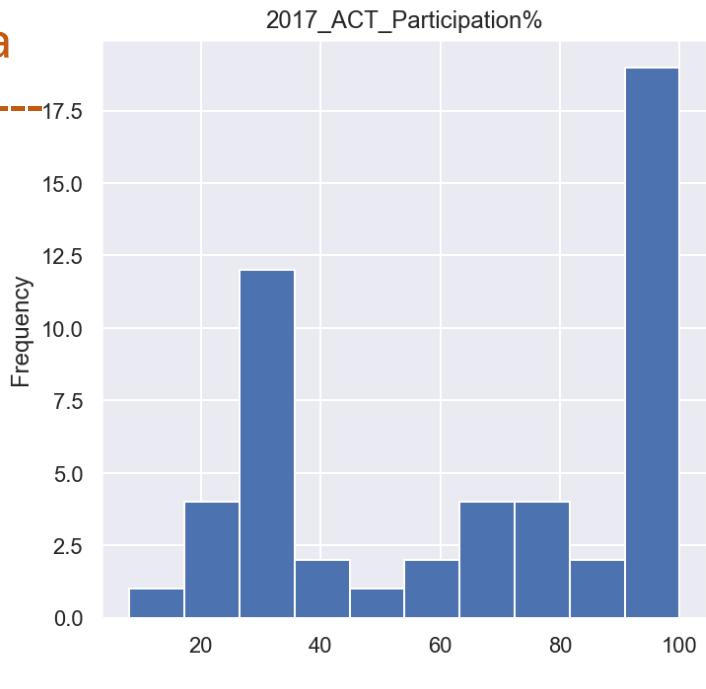
A glance at Data Distributions

SAT Vs ACT Participation %



Bimodal Data

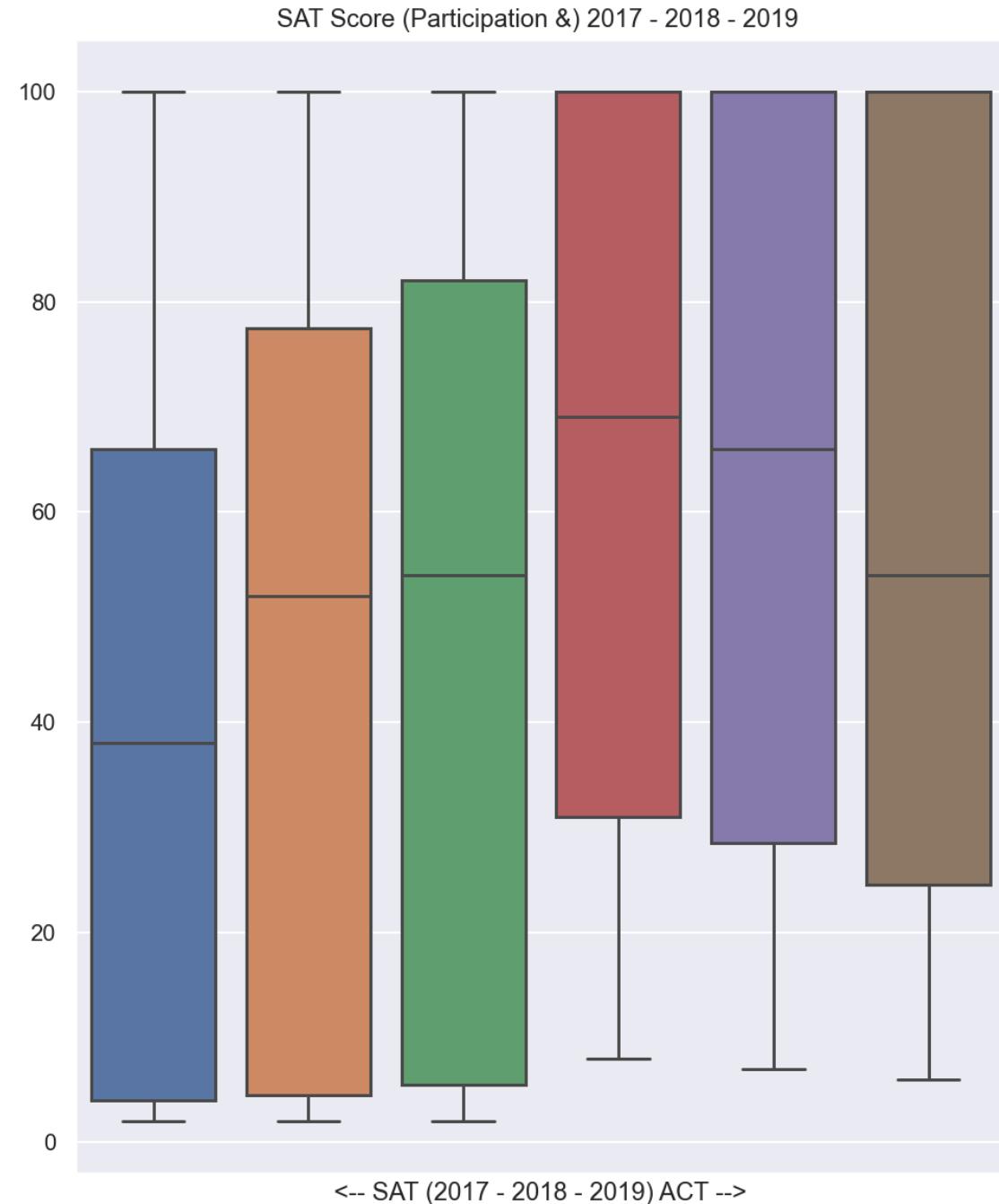
Are we
Able to
*SPOT THE
CLUSTERS?*



Everyone likes a **BOX PLOT!**

Participation %
for 2017-2018-2019

- on left, SAT %
- on right, ACT %

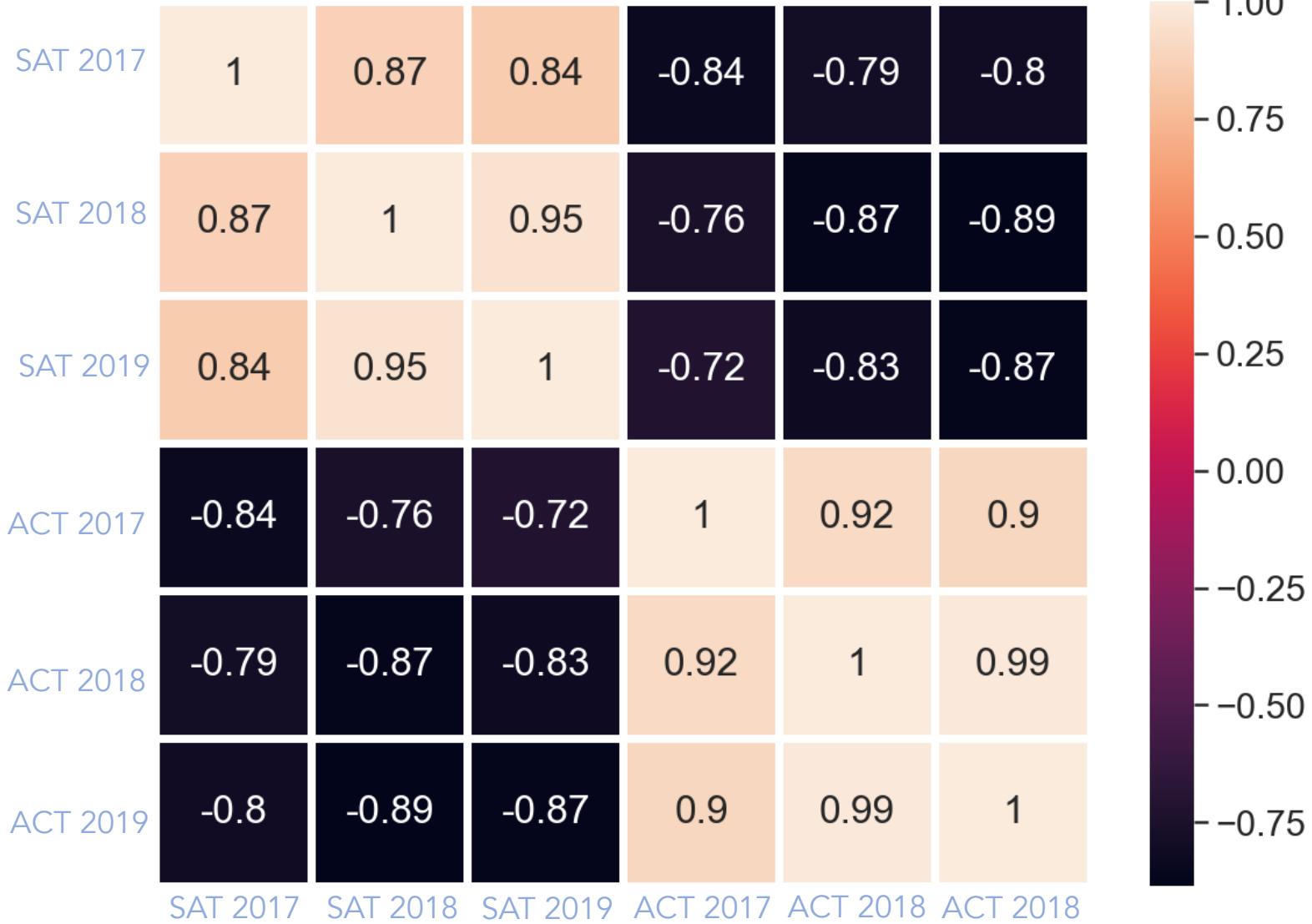


What about Collinearity?

Participation %
for 2017-2018-2019

- Very Strong Collinearity within all SAT/ACT years
- Very Strong Non-Collinearity among each other.

SAT and ACT Participation (%) 2017-2018-2019



To sum up,

- From the **box plot** above it's clear that on Avg. atleast 60% of States participate in ACT while **less than 50% of the States participate in SAT**.
- Most of the Distributions, specially various Participation Rates and the Total Scores are **Bimodal** in nature i.e. not distributed normally.
 - Factors like mandatory SAT/ACT tests classifies candidates into High Scoring and Low Scoring Candidates. Some are fully prepared due to facilities and awareness about the test, while the others just have to.
- The **strong non-collinearity between Total Score and Participation Percentages** is a matter of concern too.
- SAT - Math and ERW scores possess strong collinearity.

Recommendations for the College Boards

1. Investigate what strategies / implementations went right for States with increasing participation rates, like New York, Maryland, New Jersey, Maine, West Virginia, Colorado, Florida, Idaho, Illinois and Rhode Island.

SAT Participation %

states	sat17_participation_percent	sat18_participation_percent	sat19_participation_percent
Colorado	11.0	100.0	100.0
Florida	83.0	56.0	100.0
Idaho	93.0	100.0	100.0
Maine	95.0	99.0	99.0
Maryland	69.0	76.0	82.0
New Jersey	70.0	82.0	82.0
New York	67.0	79.0	79.0
Rhode Island	71.0	97.0	100.0
West Virginia	14.0	28.0	99.0

Recommendations for the College Boards contd.

2. Focusing more on States like Hawaii might help.

- Hawaii displayed almost same Participation % for 3 years (55% -> 56% -> 54%) for SAT, while the ACT participation rates have dropped from 90% in 2017 to 80% in 2019, unlike other states where the participation rates usually transfer from ACT to SAT and vice-versa.

sat17_participation_percent sat18_participation_percent sat19_participation_percent

states

Hawaii	55.0	56.0	54.0
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act17_participation_percent act18_participation_percent act19_participation_percent

states

Hawaii	90.0	89.0	80.0
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Recommendations for the College Boards contd.

3. District of Columbia, is another example of a state where SAT participation rates dropped from 100% in 2017 to 94% in 2019. We should definitely get some insights on what went wrong.

states	sat17_participation_percent	sat18_participation_percent	sat19_participation_percent
District Of Columbia	100.0	92.0	94.0

Opinion.

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Opinion.

	states	sat17_participation_percent	sat18_participation_percent	sat19_participation_percent
6	Connecticut	100.0	100.0	100.0
7	Delaware	100.0	100.0	100.0
8	District Of Columbia	100.0	92.0	94.0
22	Michigan	100.0	100.0	100.0
12	Idaho	93.0	100.0	100.0
9	Florida	83.0	56.0	100.0
39	Rhode Island	71.0	97.0	100.0
5	Colorado	11.0	100.0	100.0
13	Illinois	9.0	99.0	100.0

- Previous changes like Dropping Essay Requirement, changing Exam Duration to 3hrs and engage into contracts with states and schools to make SAT's affordable are all in right direction.
- We should expand these ideas to other states with low SAT scores too.

Before we end, my top 3 states

- Illinois - Tremendous Growth in SAT participation
- Colorado - Tremendous Drop in ACT participation
- Hawaii - Best all rounder, based on balance between SAT and ACT participation
 - (Hawaii is a very good example of a State that we should focus on, ACT participation rates are constantly dropping, while SAT participation rates are almost the same, for 2017, 2018 and 2019.)
- Rhode Island - Tremendous Growth in SAT participation
- District of Colorado – One of the very few States that showed decline in SAT participation percentage.

my top 3 states contd.

states	sat17_participation_percent	sat18_participation_percent	sat19_participation_percent
Illinois	9.0	99.0	100.0

states	act17_participation_percent	act18_participation_percent	act19_participation_percent
Colorado	100.0	30.0	27.0

states	sat17_participation_percent	sat18_participation_percent	sat19_participation_percent
Rhode Island	71.0	97.0	100.0

Thank you.