PEMIKA NAKATA

SAT 2019
KEY INSIGHTS

BACKGROUND

CollegeBoard

- As an employee of College Board, I am in a team that analyzes that trends and insights from the data we gathered each year to provide to our executive board.

- Since this is year 2020, we would like to evaluate the past year data as a whole and see if there are any key insights we can use to improve our test.

PROBLEM STATEMENT

I specifically would like to look at the data by each state and by intended college major to see if there is any interesting findings in the data.

"Are there any correlation between states that have high SAT scores and certain intended college majors?"

DATASET

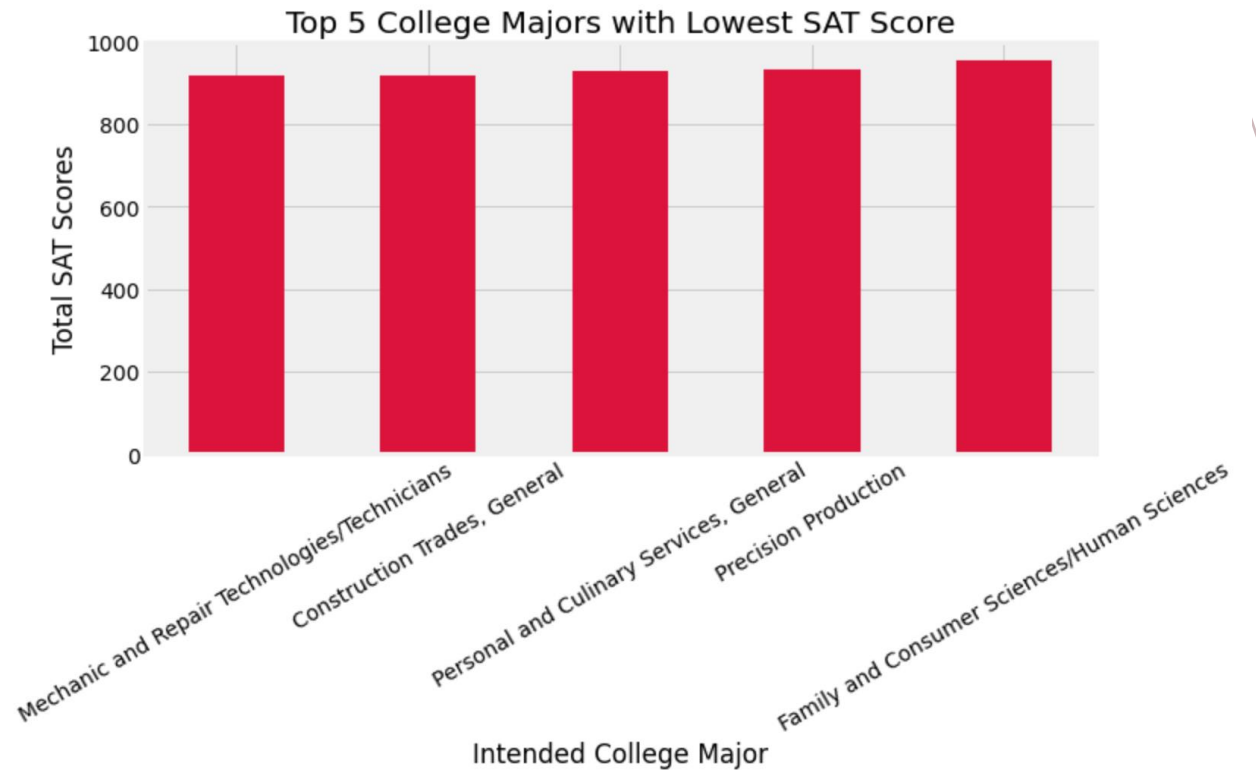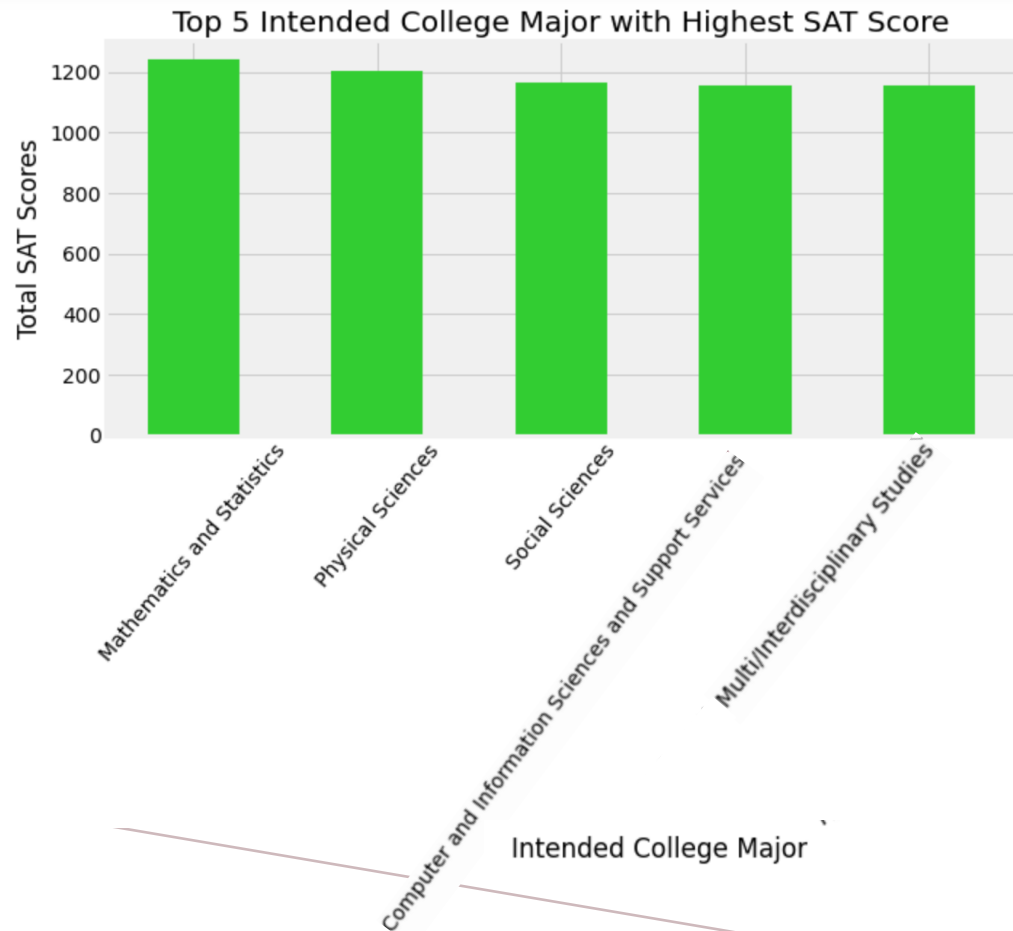- 2019 SAT Scores by State
- 2019 SAT Scores by Intended College Major

DATA OVERVIEW

| Feature	Type	Dataset	Description
state	object	sat_2019	List of US states, including Hawaii, Alaska, and Virgin island
participationrate_state	float	sat_2019	Percentage of students who took SAT test in 2019 (by state)
total_state	int	sat_2019	Total SAT score, range between 400 and 1600 (by state)
verbal_state	int	sat_2019	SAT verbal score, range between 200 and 800 (by state)
math_state	int	sat_2019	SAT math score, range between 200 and 800 (by state)
intended_major	object	sat_2019_by_intended_college_major	Intended college major of the students who took SAT test in 2019
participationrate_major	float	sat_2019_by_intended_college_major	Percentage of students who took SAT test in 2019 (by major)
total_major	float	sat_2019_by_intended_college_major	Total SAT score, range between 400 and 1600 (by major)
verbal_major	float	sat_2019_by_intended_college_major	SAT verbal score, range between 200 and 800 (by major)
math_major	float	sat_2019_by_intended_college_major	SAT math score, range between 200 and 800 (by major)

TOP 5 STATES WITH BEST SCORES AND WORSE SCORES
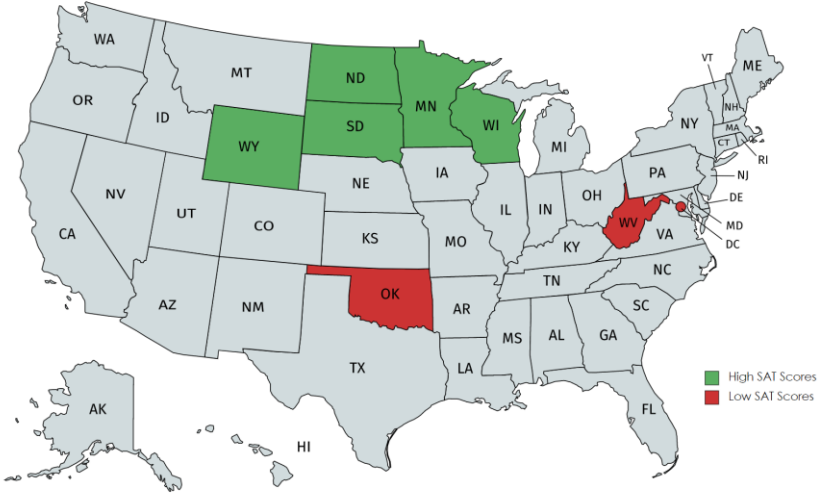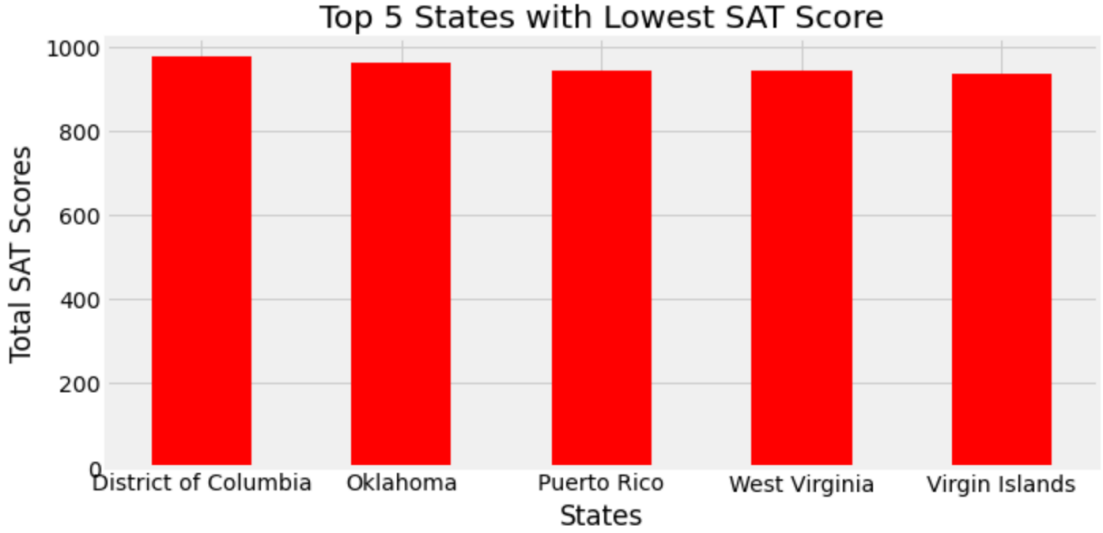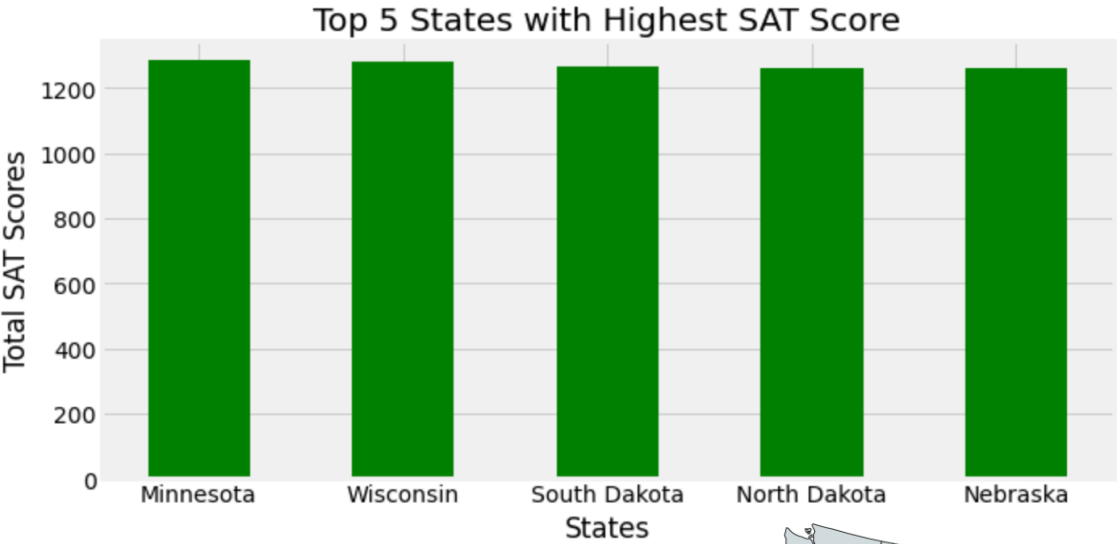
# TOP 5 INTENDED COLLEGE MAJORS WITH BEST SCORES AND WORST SCORES

Top 5 Intended College Major with Highest SAT Score

Total SAT Scores (y-axis: 0 to 1200)

Intended College Major (x-axis):
- Mathematics and Statistics
- Physical Sciences
- Social Sciences
- Computer and Information Sciences and Support Services
- Multi/Interdisciplinary Studies

Top 5 College Majors with Lowest SAT Score

Total SAT Scores (y-axis: 0 to 1000)

Intended College Major (x-axis):
- Mechanic and Repair Technologies/Technicians
- Construction Trades, General
- Personal and Culinary Services, General
- Precision Production
- Family and Consumer Sciences/Human Sciences

TOP 5 INTENDED COLLEGE MAJORS WITH HIGHEST SCORES FOR EACH SECTION

Top 5 College Majors with Highest Math Score

Top 5 College Majors with Highest Verbal Score
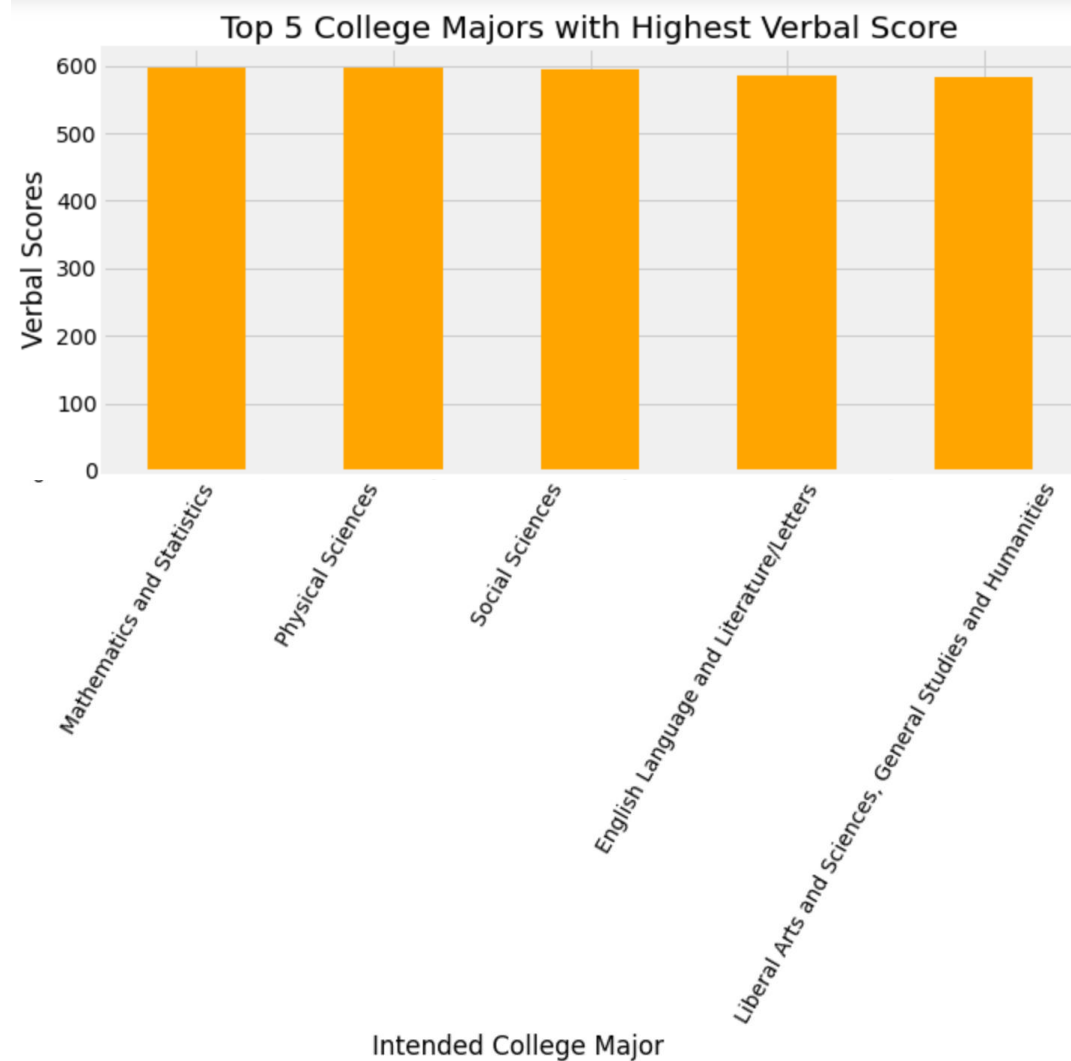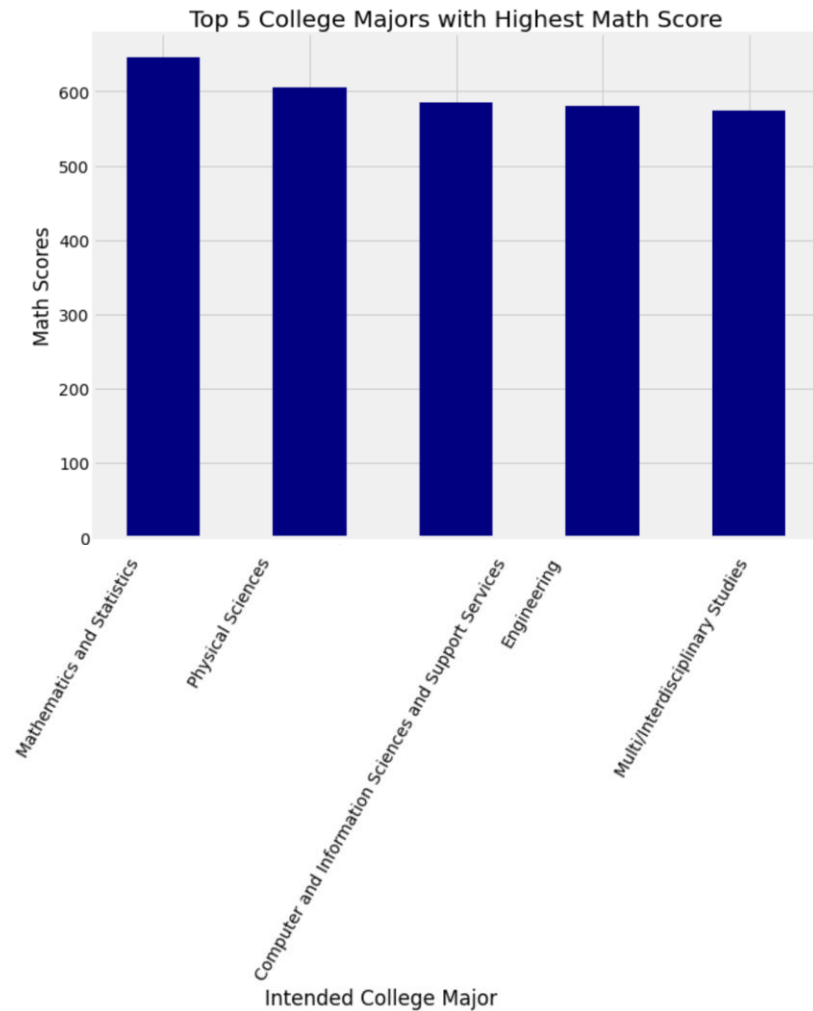
THERE ARE 14 STATES WITH ZERO PARTICIPATION RATES

Virgin Islands, Puerto Rico, North Dakota, Wyoming, and Mississippi are states with the lowest participation rate.
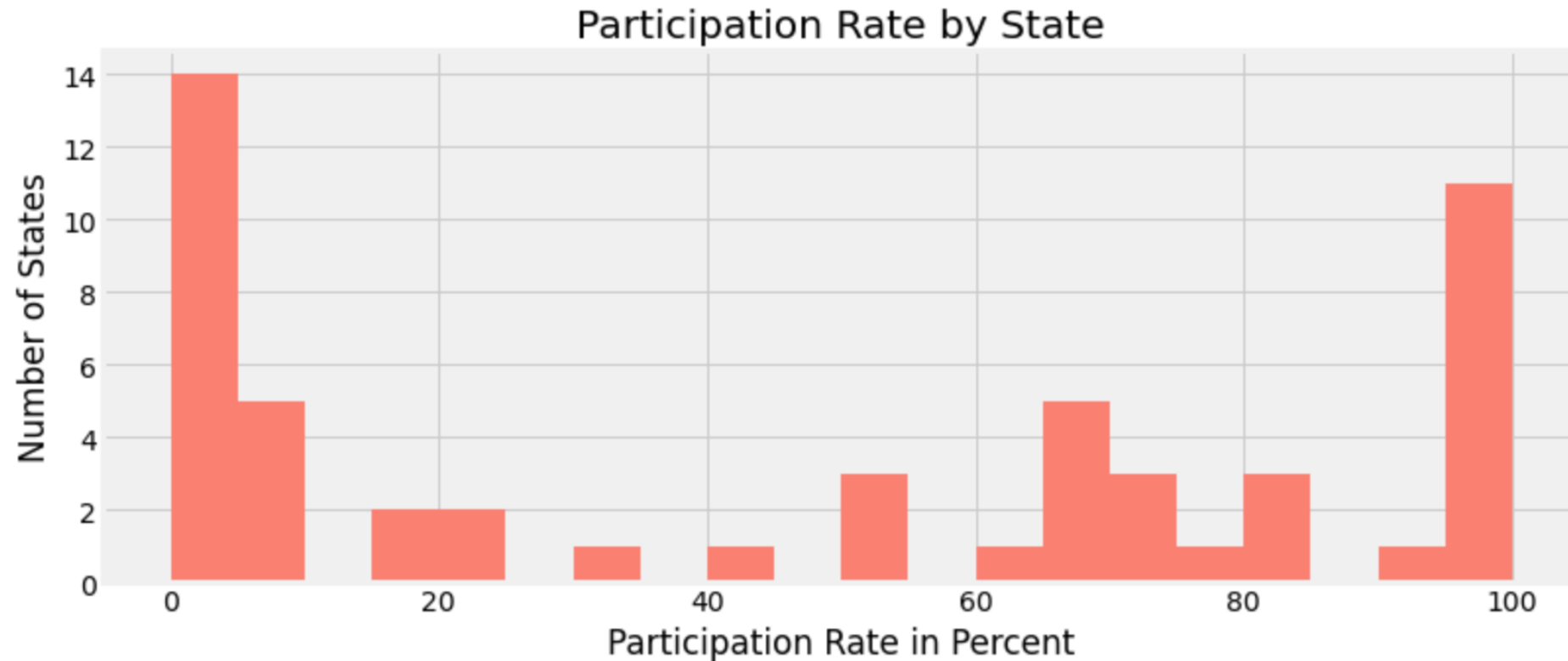
Participation Rate by State

THERE ARE 14 INTENDED COLLEGE MAJORS THAT HAVE ZERO PARTICIPATION RATE

Health Professions, Business Management, and Engineering have the highest participation rates compared to others. College Board can look into these college majors whether they can adapt the test to make it more related to these field of study. So, the college might place more importance into SAT for students to get accepted into these intended majors.
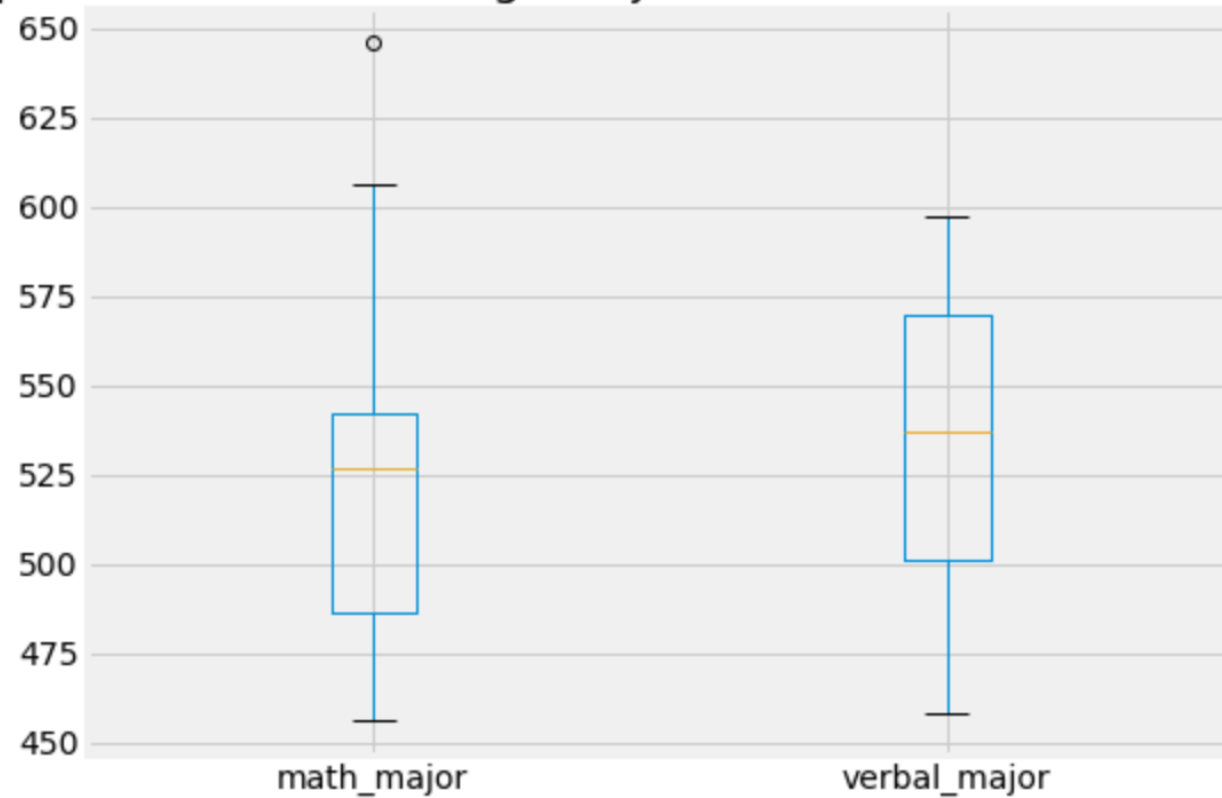

Participation Rate by Intended College Major
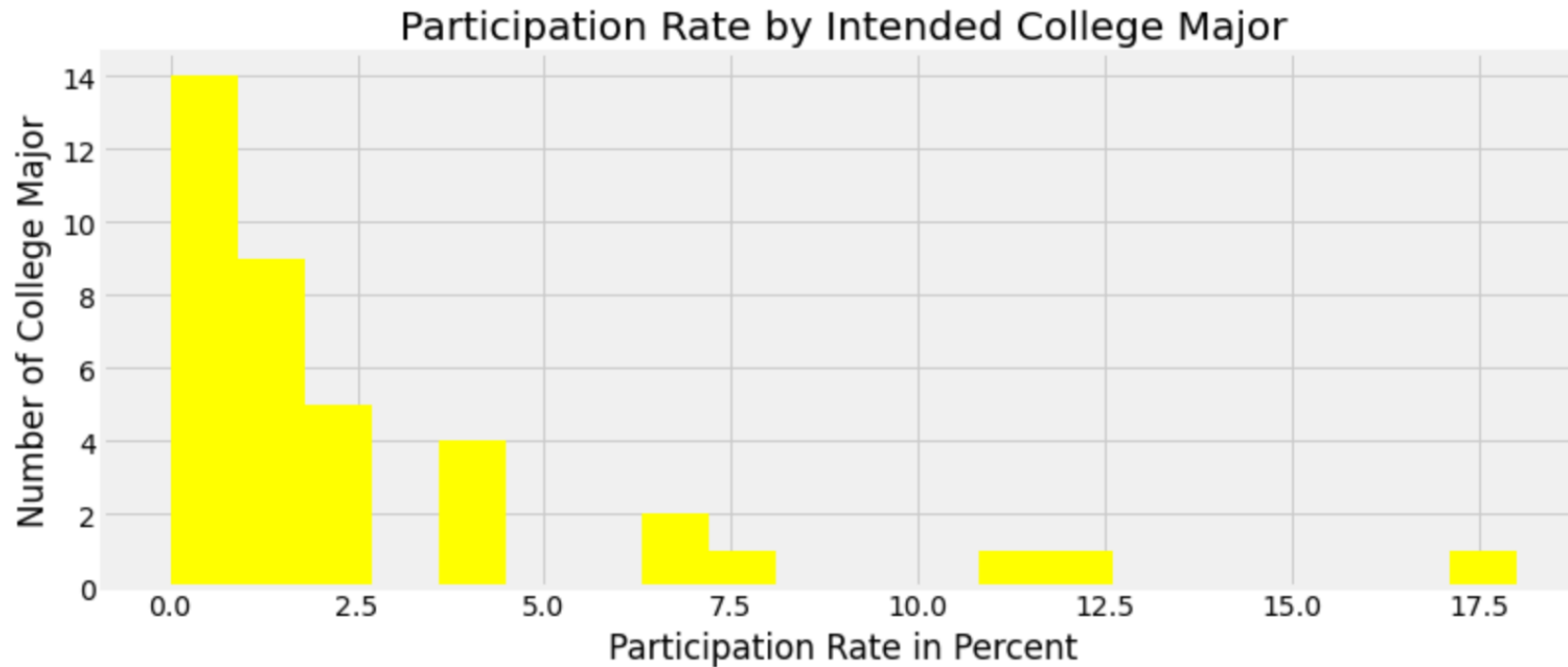
STUDENTS TEND TO SCORE HIGHER IN VERBAL COMPARED TO MATH
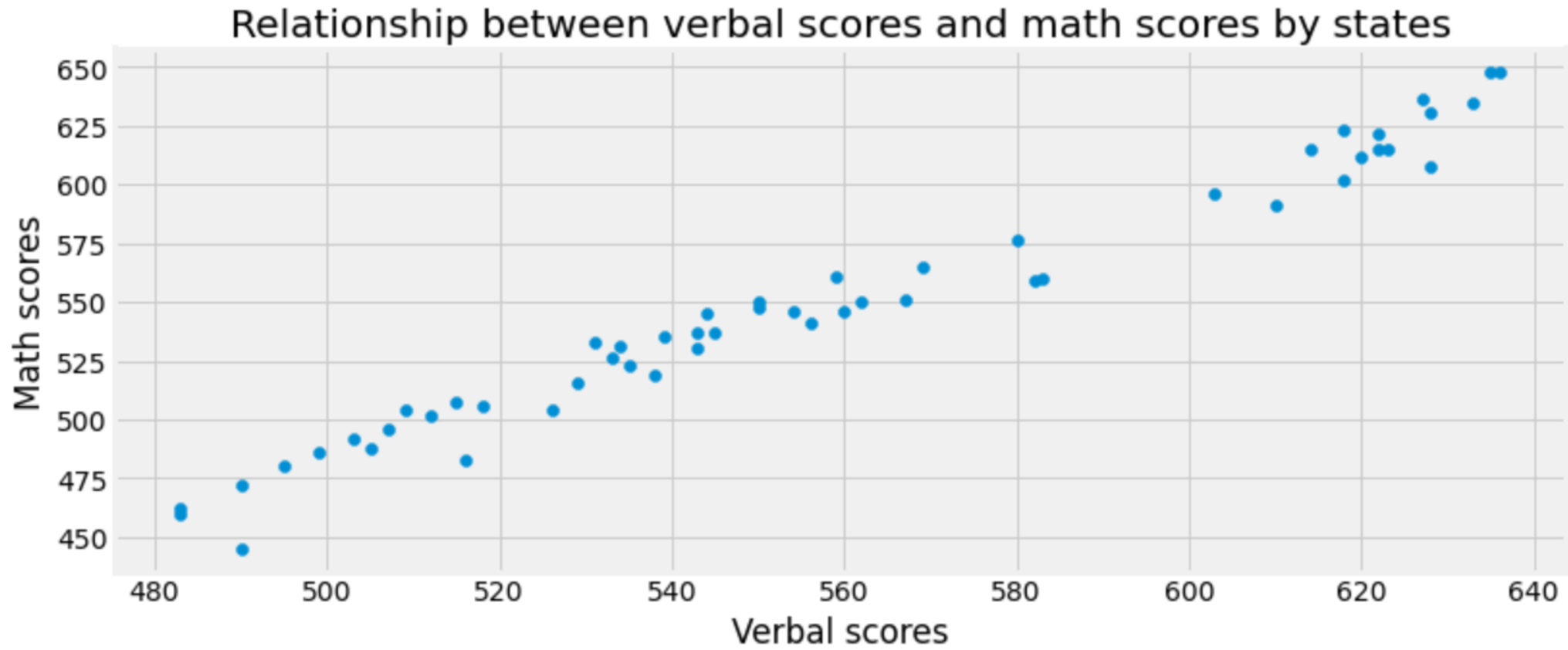

Boxplot of State Math scores and Verbal scores
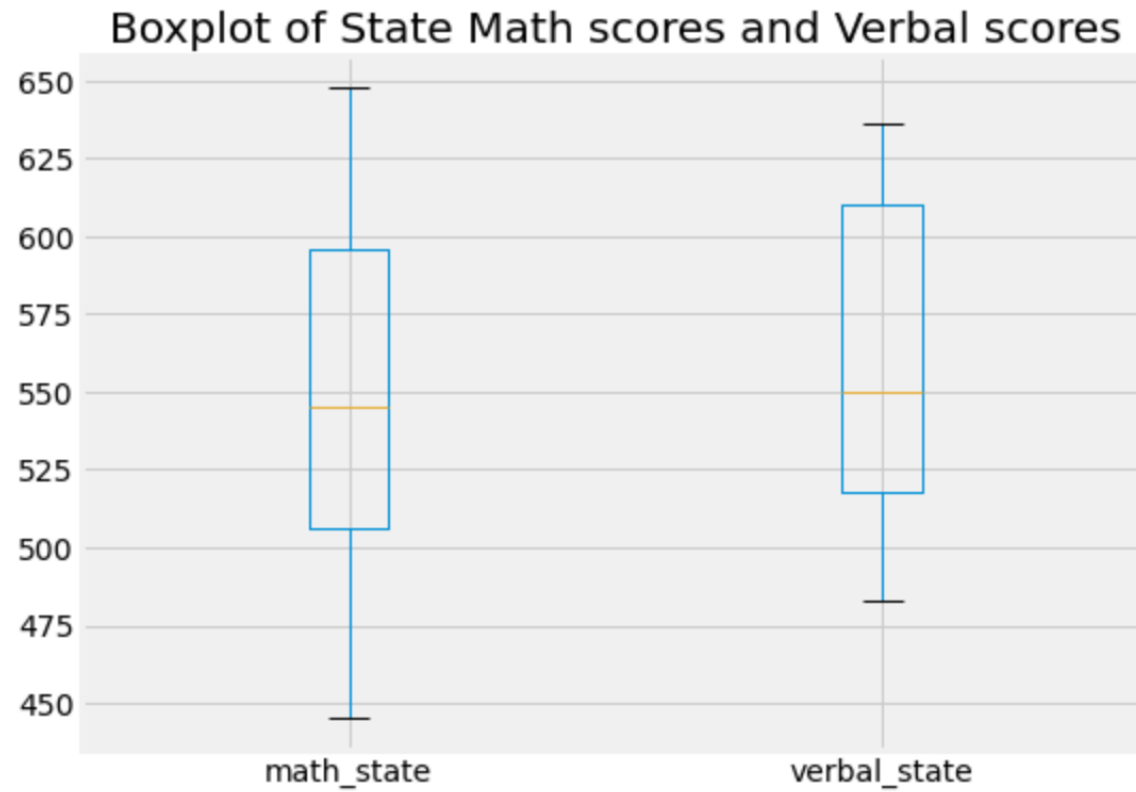
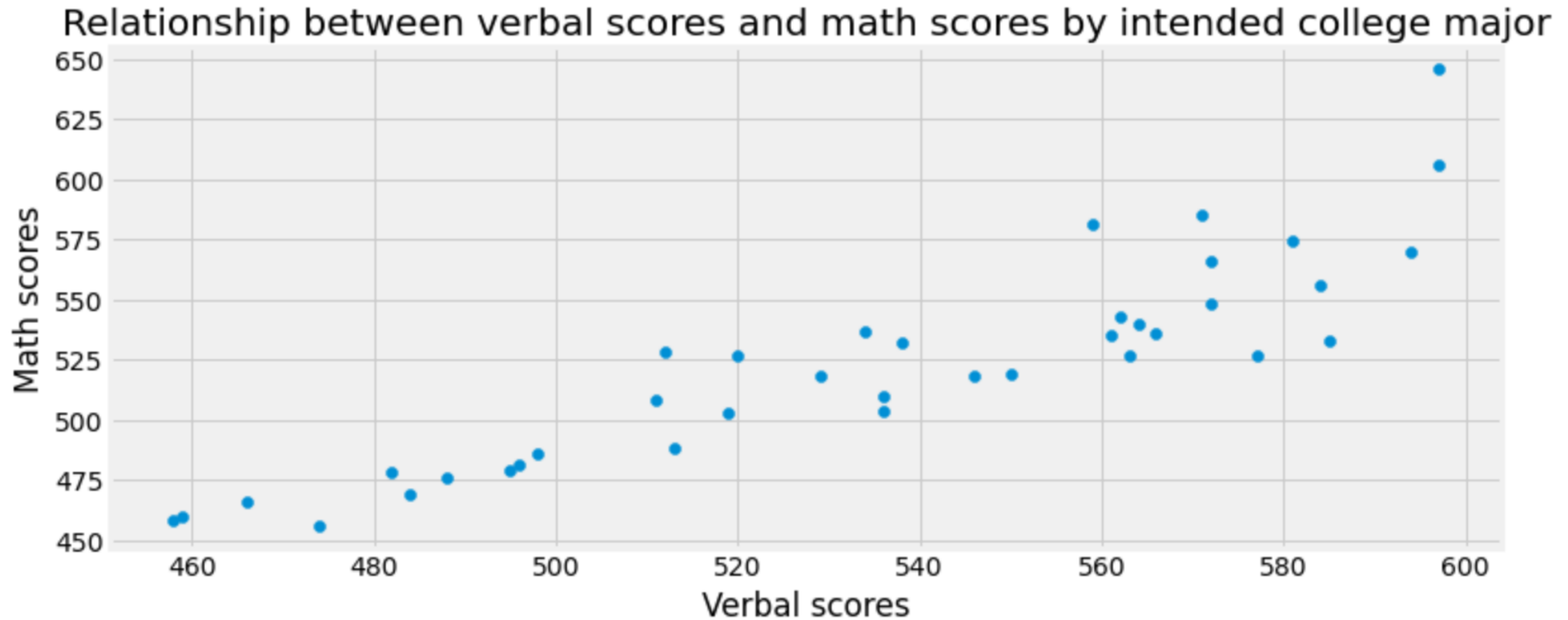# THE BOXPLOT SHOW SIMILAR DATA FOR BOTH SCORES BY STATE AND SCORES BY COLLEGE MAJOR

Boxplot of Intended College Major Math scores and Verbal scores

# THERE IS A STRONG CORRELATION BETWEEN VERBAL AND MATH SCORES

Relationship between verbal scores and math scores by states

STUDENTS WHO DID WELL IN ONE SECTION, TEND TO ALSO DID WELL IN ANOTHER SECTION

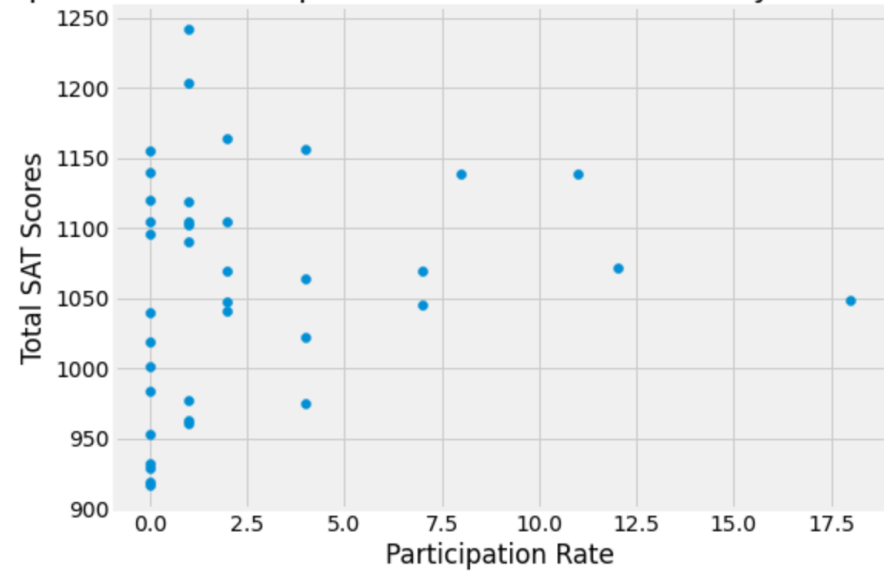Relationship between verbal scores and math scores by intended college major

THERE IS SOMEWHAT NEGATIVE CORRELATION BETWEEN PARTICIPATION RATE FOR EACH STATE AND SAT SCORES

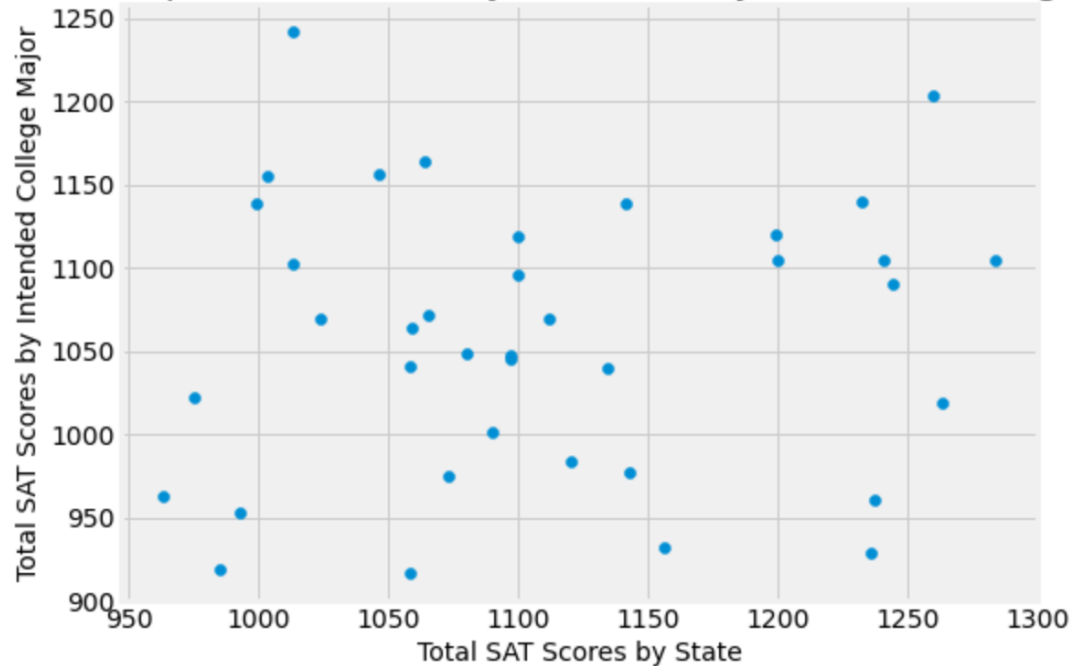Relationship between Participation Rate and SAT Scores by state
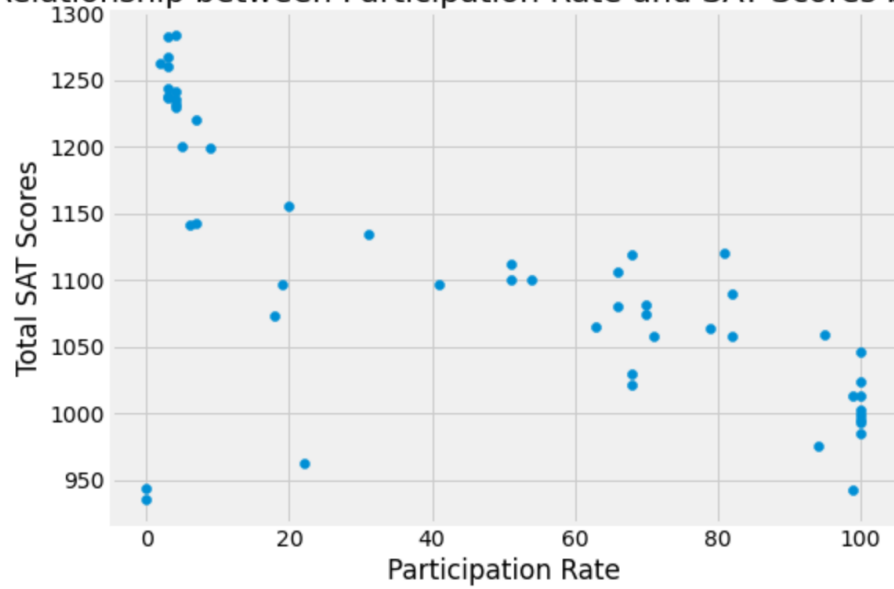
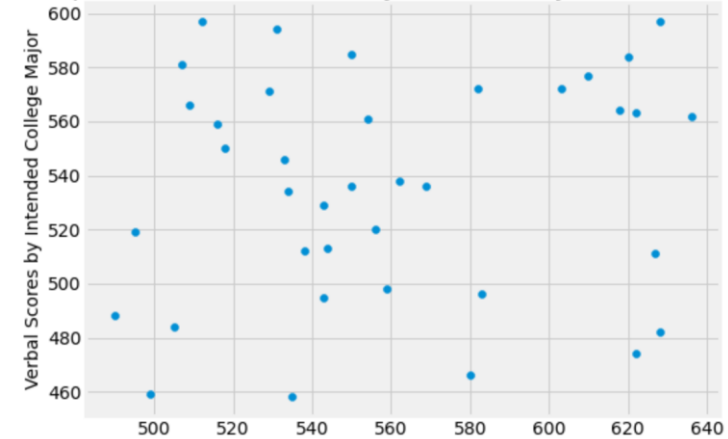Relationship between Participation Rate and SAT scores by Intended College Major

THERE IS NO CORRELATION IN THE SAT SCORES BY STATE AND THE SCORES BY COLLEGE MAJOR
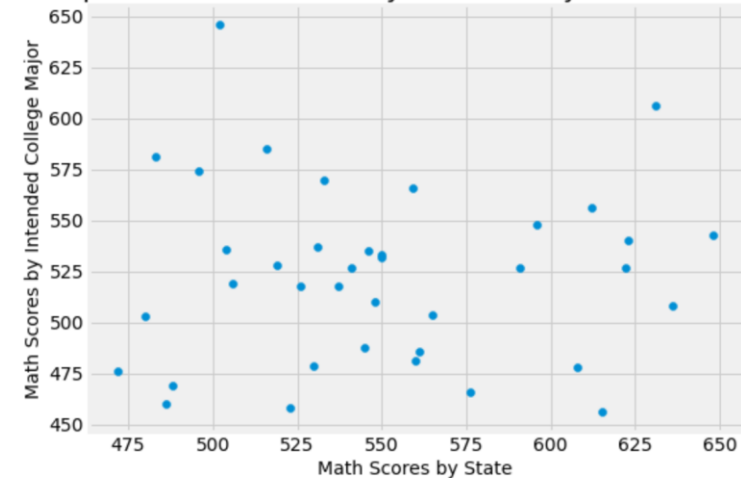
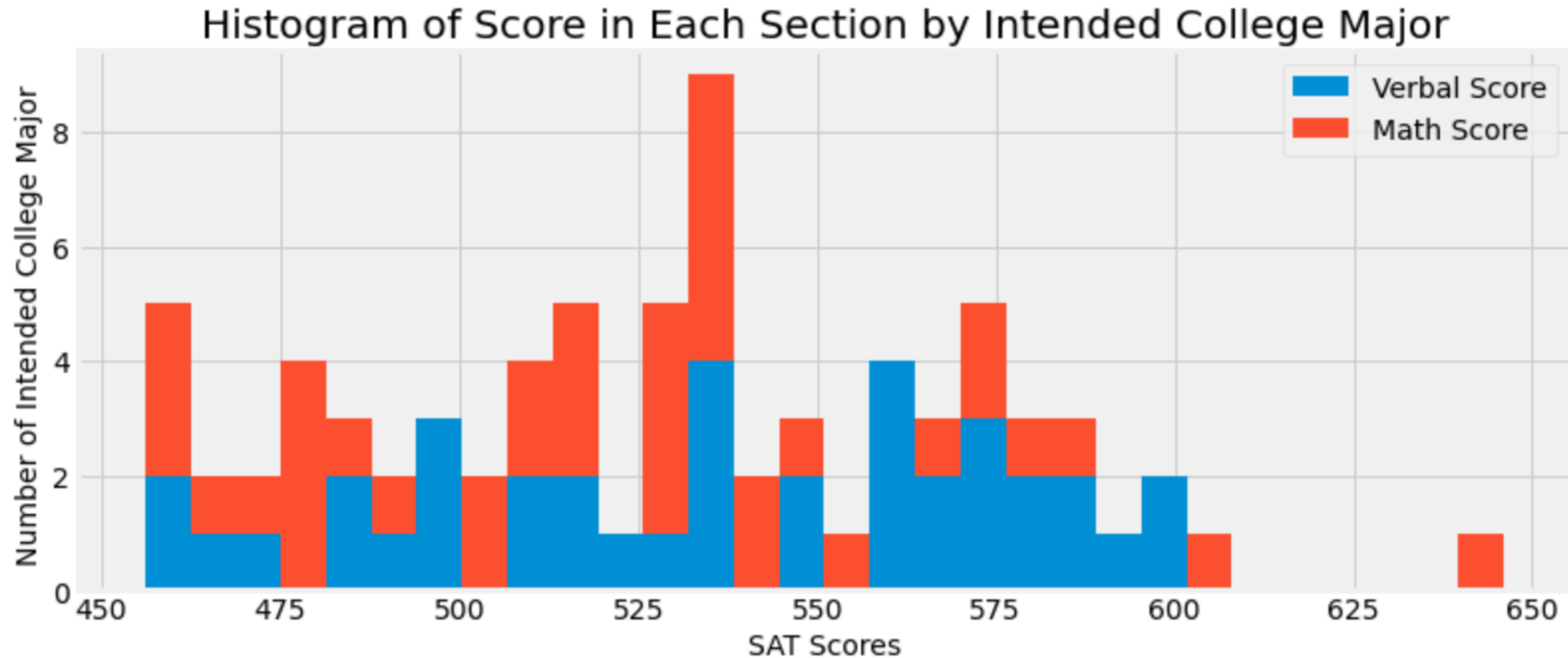# THERE ARE HIGHER NUMBER OF STATES THAT PERFORMED WELL IN MATH COMPARED TO VERBAL

Histogram of Score in Each Section by State
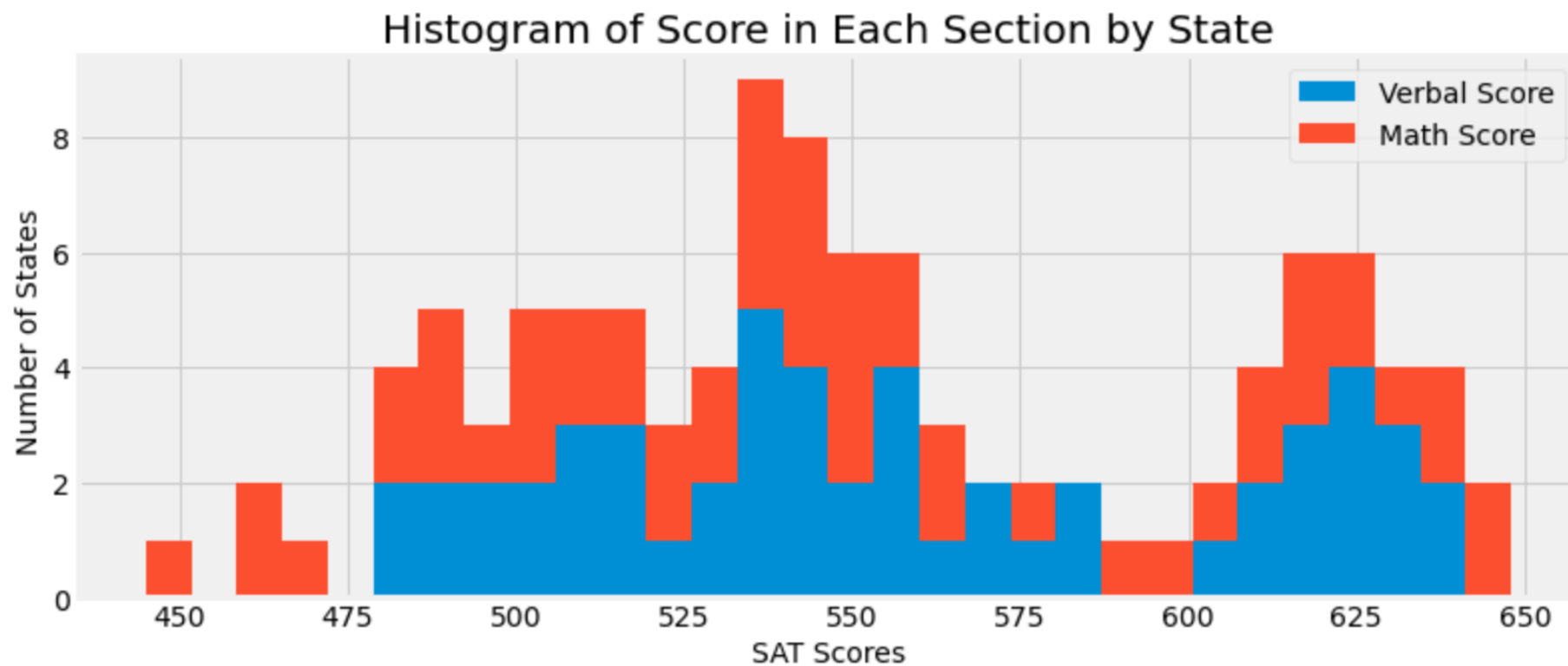
SIMILARLY, THERE ARE HIGHER NUMBER OF INTENDED COLLEGE MAJORS THAT PERFORMED WELL IN MATH COMPARED TO VERBAL

KEY TAKEAWAYS (1)

- The top 5 states with highest SAT scores are states in the Midwestern area

- On the other hand, the top 5 states with lowest SAT scores tend to be those that are not in the main US territory i.e. Puerto Roco, Virgin Islands.

- The top 5 intended college majors with the highest total SAT scores are mainly majors that are related to Math i.e Mathematics and Statistics, Physical Science, Social Science, and Computer and Information Science.

- Students who intended to major in science related fields also received highest scores in verbal.

- College majors with least scores are those that tend to use less of math and verbal in the fields i.e. Mechanic and repair technology, construction trade, personal and culinary services. One assumption is these majors might not use SAT scores as a college admission test.

- There are more number of states that do well in math compared to those of verbal.

- Similarly, there are more number of intended college majors that do well in math compared to those of verbal.

- Generally, students tend to do better in verbal compared to math as they have higher minimum and higher maximum scores. The median for verbal section is also slightly higher.

KEY TAKEAWAYS (2)

- There are 14 intended college majors that have zero participation rate

- Health Professions, Business Management, and Engineering have the highest participation rates compared to others.

- States with low participation rates are the same states with low SAT scores

- The main question that I was looking at is that "are there any correlation between states that have high SAT scores and certain intended college majors?" and the short answer is no.

- There is no correlation in the SAT scores by state and the scores by college major.

- There is a strong positive correlation in verbal scores and math scores.

- There is somewhat negative correlation between participation rate for each state and SAT scores.

- There is no correlation between participation rate for each intended college major and SAT scores.

RECOMMENDATION

My recommendations are to keep looking for additional data on:

- top college majors that have highest and lowest participation rate

- states with low participation rate and mechanism behind states with high participation rate

- additional data to find correlation between states and intended college major

THANK YOU