

A State-by-State Analysis of Performance in SAT from 2000 to 2019

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1. A B C D
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 5. A B C D



Exploratory Data Analysis and Visualization

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INTRODUCTION

- SAT is a standardized test administered by the College board and taken by the high school students for their college admissions.
- Multiple-choice pencil-and-paper test.
- Purpose is to test college-readiness of high-school students
- Test Scores play a critical role in the decision-making process of the college admissions team
- Modern-day SAT scores students on a 1600-point scale and comprises of a Math and a Reading/Writing section each awarded between 200-800 points

BRIEF HISTORY

- Originated from an IQ test for US Army recruits entering World War I
- First SAT was administered on June 23, 1926
- Original SAT consisted of single score derived from nine subtests- 7 focusing on Verbal and 2 on Math
- By 1952, SAT started resembling the current day format - Verbal and Math Sections
- Over half a million students took the tests by 1960s
- 1994 marked the first-time students were allowed to use calculators which continues to this day
- 2005 marked the introduction of a separate essay section which increased the maximum score from 1600 to 2400
- 2016 marked another change in the SAT and back to 1600 scoring scale. Modern day SAT consists of two sections: Evidence based Reading-Writing and Math

WHAT DO THE CRITICS SAY?

- Inherently biased in favor of affluent, white and Asian-American students
- SAT test taking is expensive with parents spending thousands of dollars for the student's prep
- Makes higher education less accessible to disadvantaged kids

"It's the evil empire, The SAT is basically a dodge.... It provides a shiny scientific cover for a system of inequality that guarantees that rich kids go to the most selective college. It makes all that sound like science when it's not."

-Dr. Anthony P. Carnevale

OBJECTIVES

1. Trends in the SAT scores and the participation rates by States
2. Trends in the SAT scores by selected student characteristics

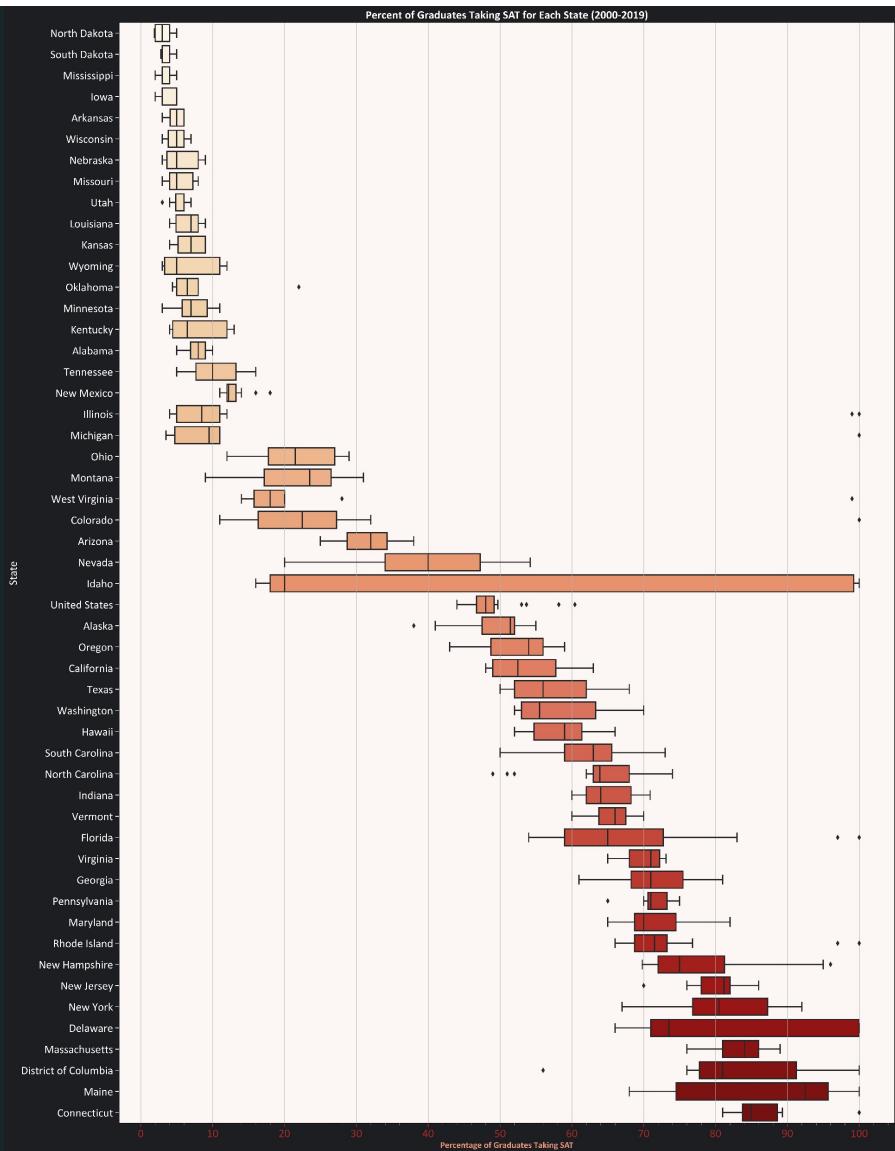
INPUT DATASETS

Two sets of SAT scores were downloaded from *National Center of Educational Statistics* for the period of 2000-2019

1. SAT scores by State
2. SAT scores by selected student characteristics

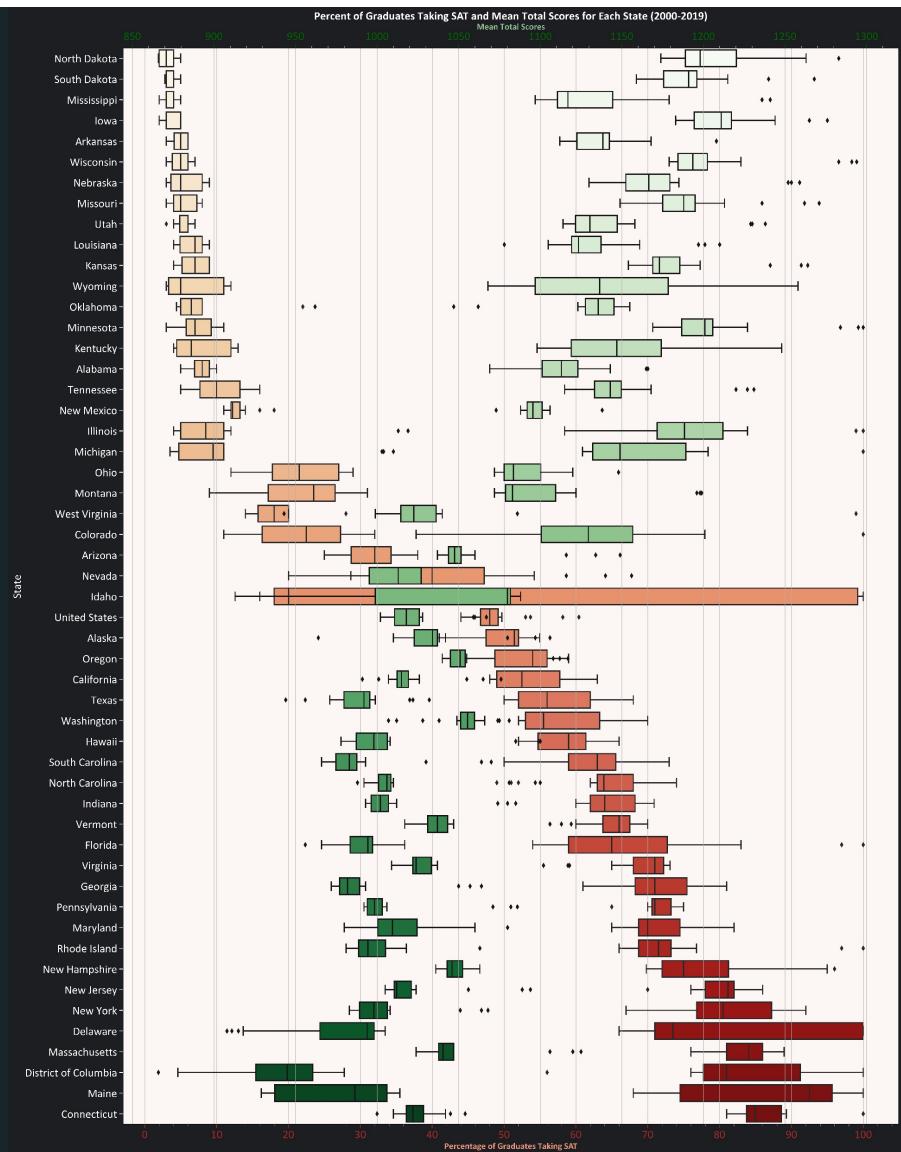
PARTICIPATION RATES

- Boxplot showing the distribution of percent of graduates taking SAT by each state for the years 2000-2019
- On the lower end, percentages have varied between 5-10% for 20 states with the Dakotas having the lowest rates
- D.C., Maine, Connecticut have participation rates over 80%
- Idaho started covering the fees of SAT tests from 2013-2014 which saw the states SAT participation rates jump from 20% to ~100% in 2014



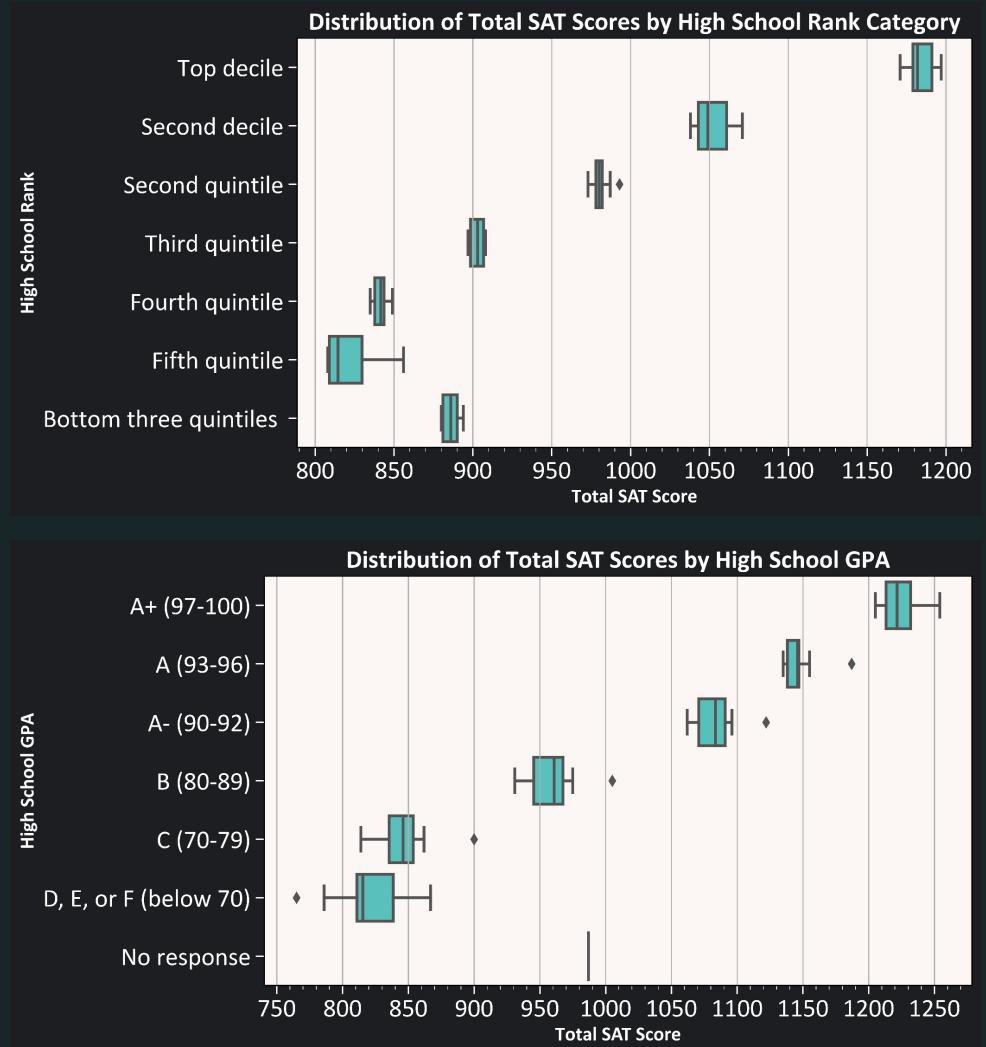
PARTICIPATION RATES & SAT SCORES

- Boxplot showing the distribution of percent of graduates taking SAT by each state and their corresponding SAT scores for the years 2000-2019
- In general, states with lower participation rates tend to have higher scores and wider variability
- SAT scores should be adjusted for their corresponding participation rates for a real comparative analysis



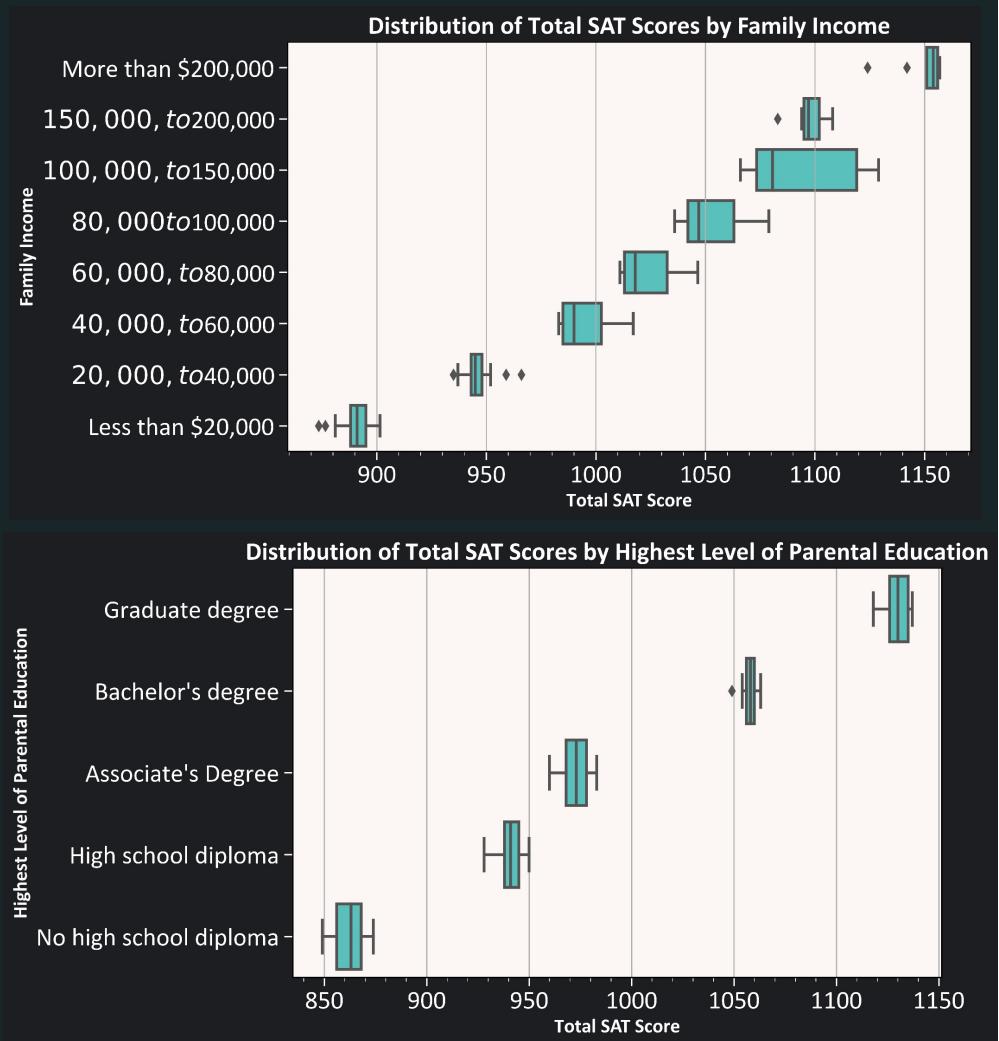
HIGH SCHOOL PERFORMANCE & SAT SCORES

- Students performing better in school tend to have higher SAT scores
- Average SAT scores for the top performing students are around 1200 and at the lower end students score around 800

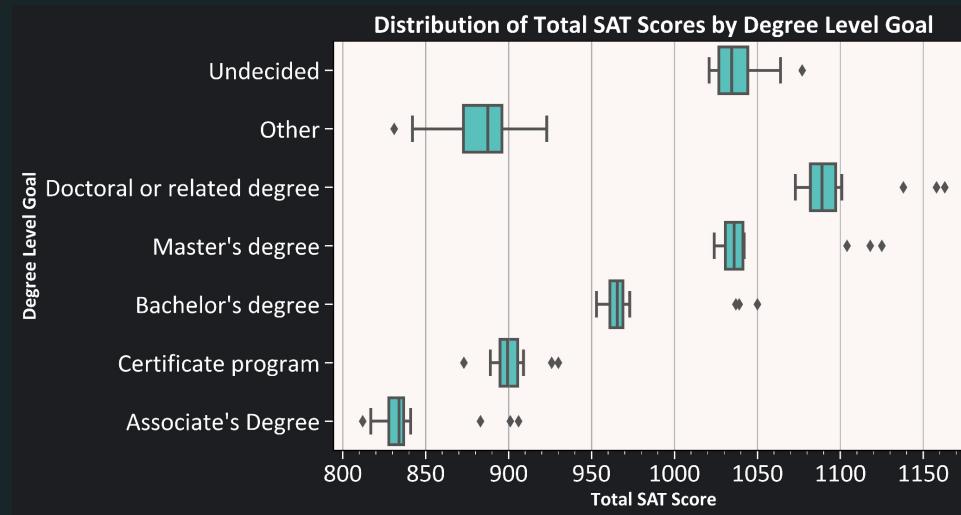


FAMILY BACKGROUND & SAT SCORES

- Kids belonging to families with higher income and advanced degrees perform significantly better than those belonging to low-income and no high school diploma families



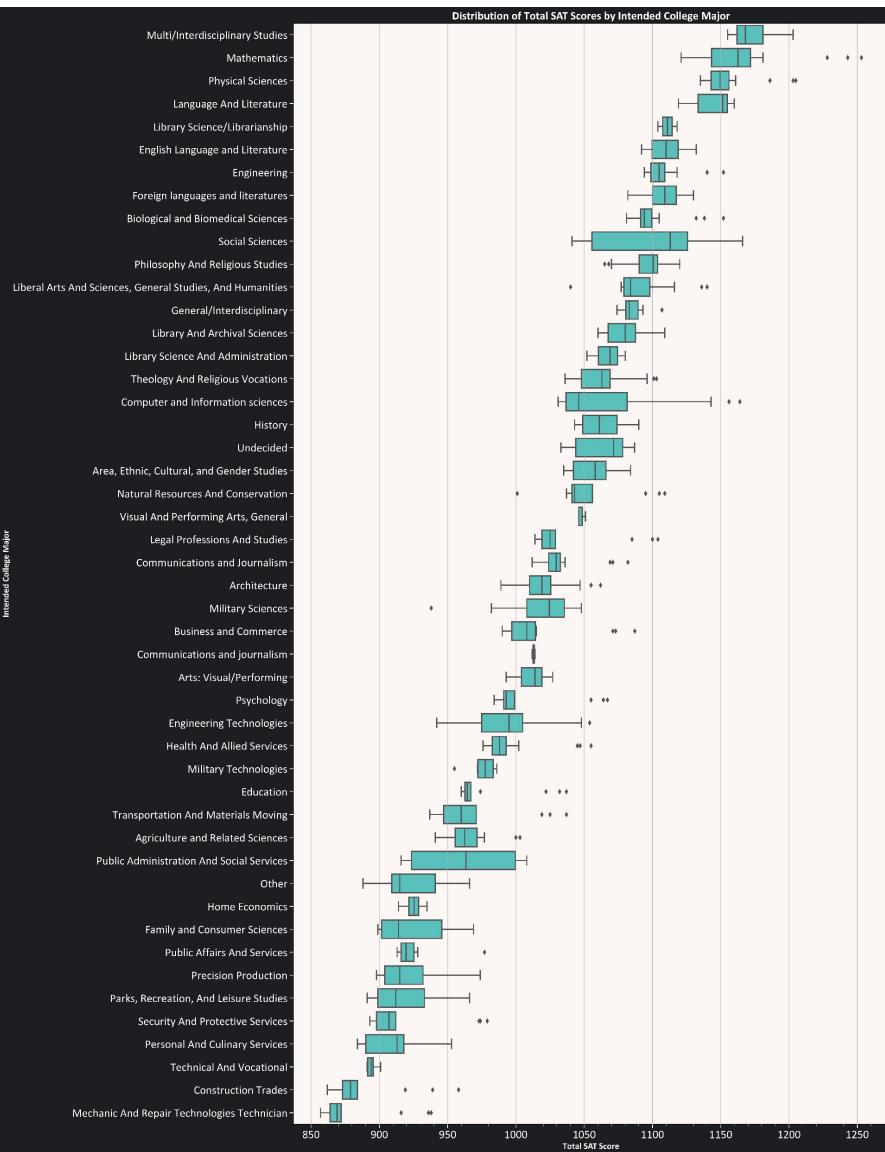
DEGREE LEVEL GOAL & SAT SCORES



Students with higher SAT scores tend to aim for more advanced degrees in their careers

INTENDED COLLEGE MAJOR & SAT SCORES

Boxplot shows how the SAT scores influences the student's decision in selecting their majors



CONCLUSIONS

- Certain states which have started covering the SAT test fees have seen an increase in the student participation in the recent years
- Students with a good academic performance also perform better in the SAT test. Although this should not come as a surprise, it does show that SAT does its job well as a standardized metric to evaluate student's academic performance across wide ranges of schools, districts, states
- Family's background plays a huge role in the student's performance in the SAT. If the colleges started to rely on a standardized metric as a sole admission's criteria, it will end up severely disadvantaging the students coming from low-income families
- Student's academic choices and their acceptance into a particular major are greatly influenced by their SAT scores

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