

Should I take the ACT or SAT?



Joel Quek
Steven Chang
Natasha



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Going through basic statistics followed by the methodology and explaining how you can strategically choose based on data



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Providing simple steps on implementing this insights to increase your chance

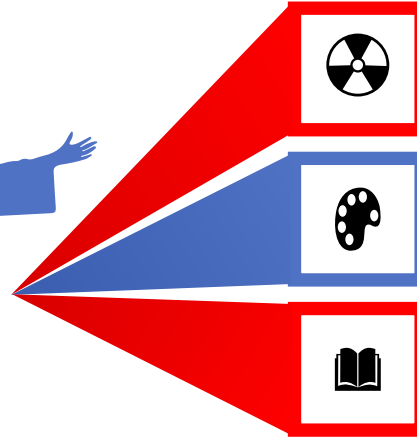
Background



Hefty Cost \$\$\$



Education



Sports Scholarship

Artistic Paths

Remarkable Test Result

- GPA
- Standardized Test (ACT/SAT)



Improve quality of life

Problem Statement

Goal

Increase student's chance to get accepted into a college or major

An Informed Decision

Quick guidance on which test to choose by keeping in mind which school or major we want to go to



How?

Helping students get better score for the big test

(Helping students to choose the ideal test)

What's the problem?

Time is limited

- School
- CCA
- Test Preparation

Statistics 101

What is Outlier?

Outliers in regression are **observations that fall far from the "cloud" of points** (our fitted model)

Why we want to find Outliers?

We will explain in next few slides.

How to find Outliers?

Studentized residuals:

$$r_i = \frac{e_i}{s(e_i)} = \frac{e_i}{\sqrt{MSE(1 - h_{ii})}}$$

An important technique in statistics to detect outliers !

We identify points with absolute value of Studentized residuals > 2 as outliers.

Findings

By Major

Methodology

Average score was used for comparison.
(We did not use 25th or 75th percentile due to unavailability of data online.)

Findings

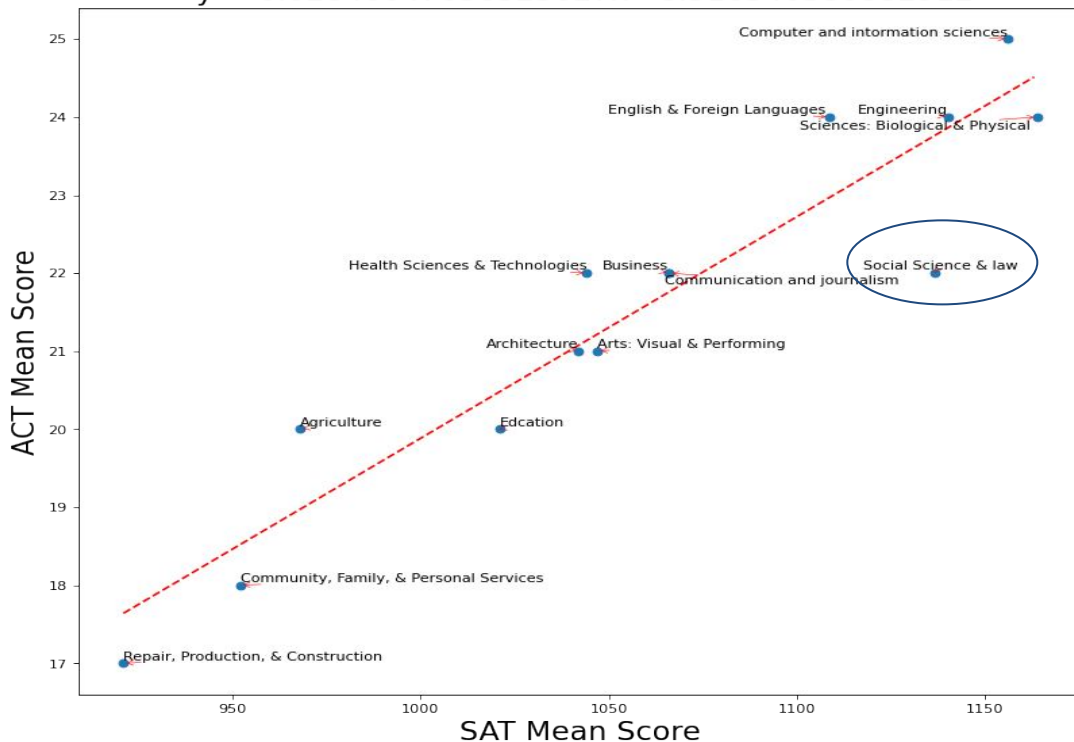
Most points are fitted well in the linear model, except one outlier (Social Science and Law with **Studentized residuals**: -3.1)

Implication

If the actual mean ACT score of an intended major is much lower than **expected** value, then students who want to study this major should take SAT.
Conversely, if actual ACT score is higher than expected, students should take ACT instead.

Fitted Linear Model of Average ACT vs SAT by Major:

$$y = 0.02840047636325027x - 8.516340380882912$$



Findings

By Major

Methodology

Average score was used for comparison.
(We did not use 25th or 75th percentile due to unavailability of data online.)

Findings

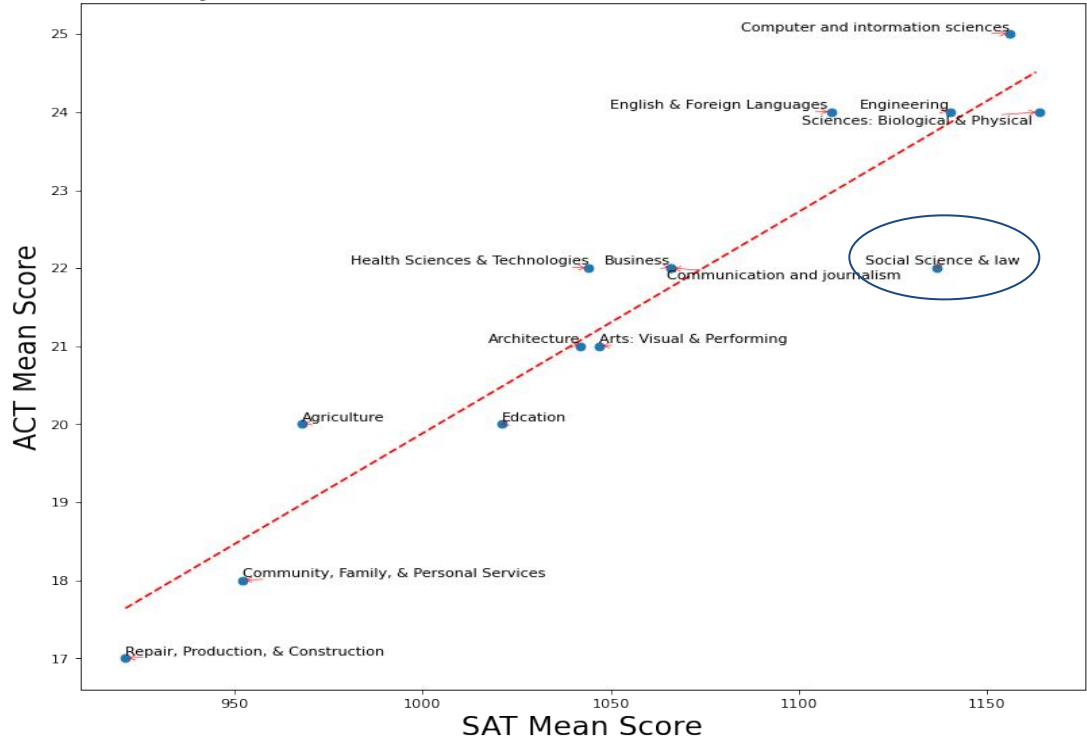
There is strong linear relationship between SAT and ACT mean score by Majors. [$r > 0.94$]
Most points are fitted well in the linear model, except one outlier (Social Science and Law with **Studentized residuals**: -3.1)

Implication

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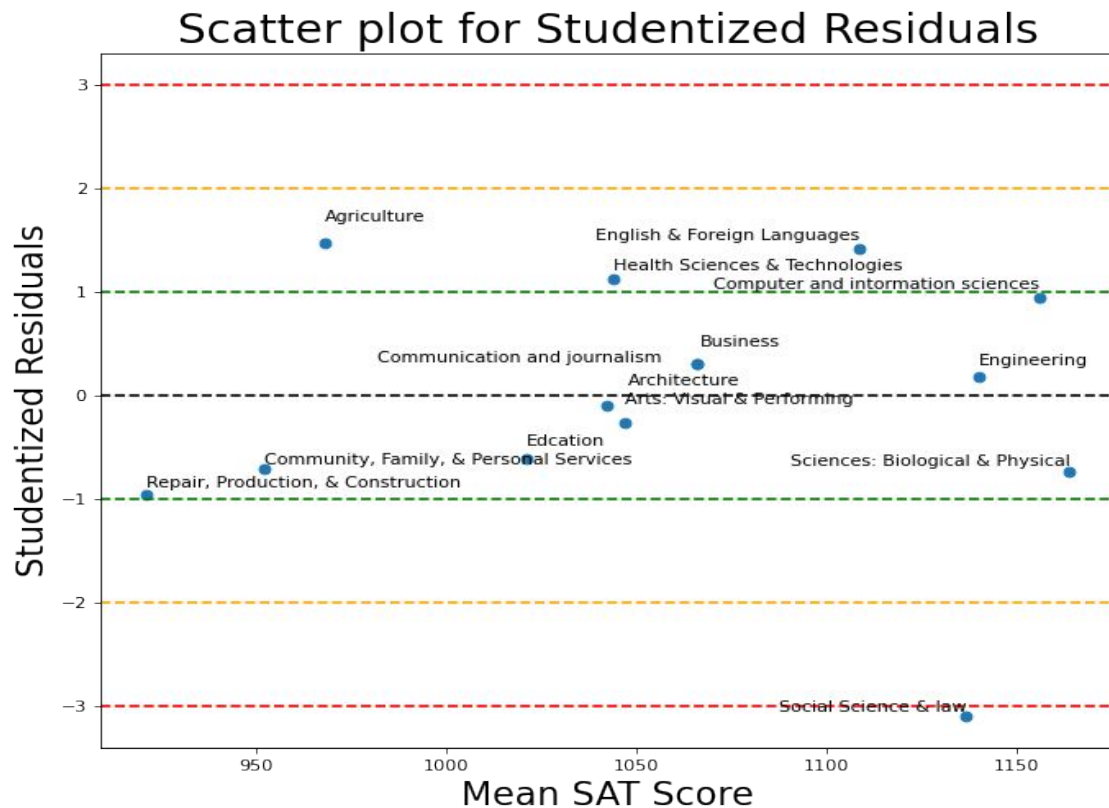
Fitted Linear Model of Average ACT vs SAT by Major:

$$y = 0.02840047636325027x - 8.516340380882912$$



Findings

By Major



Findings

By College

Methodology

25th Percentile captures the lowest scoring students that are accepted into the college.
(Each dot represents the ACT/SAT Scores from the same college)

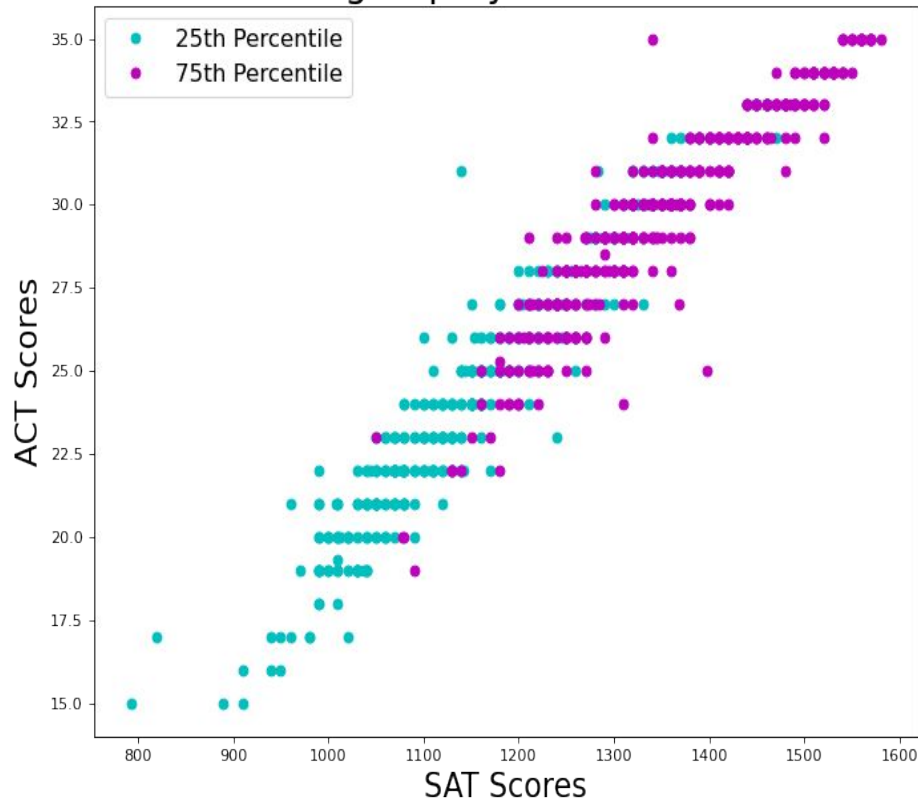
Findings

25th Percentile has a higher correlation between SAT and ACT Score than the 75th Percentile. [$r > 0.96$]

Implication

If the actual college acceptance 25th Percentile ACT score is much lower than **expected** value, then students who want to apply for this college should ACT.
Conversely, if actual ACT score is higher than expected, students should take SAT instead.

ACT vs SAT scores group by students' intended schools

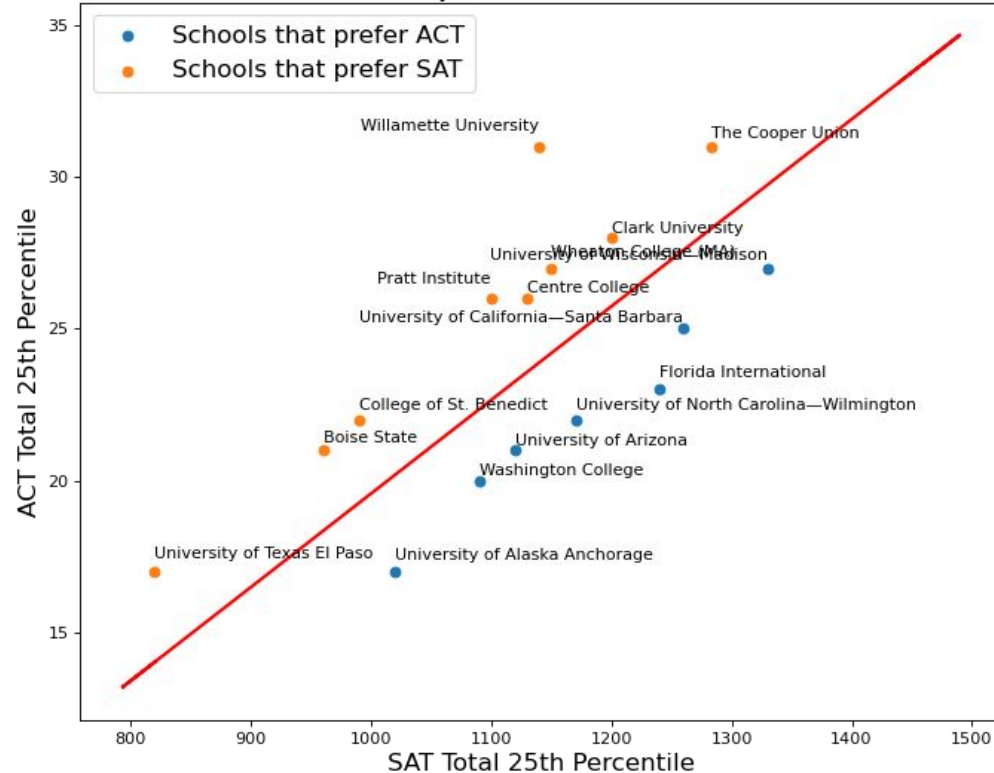




Findings

By College

Schools with preference for SAT/ACT





Decisions

Goal Setting

Decide which school/ major that you intend to go

Decide ACT/SAT

Looking which Test is ideal for your intended school or major

Fee Waiver?**

Let's look at any assistance schemes that we can leverage on and make sure we make good use of them.

Prepare for Test!

Maximize your time to prepare for the preferred test.

- Enrolled in National School Lunch Program?
- Family annual income below USDA Good and Nutrition Service?
- Enrolled in student aids?
- Part of family that receives public assistance?
- Live in public housing? Foster home? Homeless?
- Ward of the state?



Reference Table

ACT	SAT
By Intended School	
University of Alaska Anchorage Washington College University of Arizona University of North Carolina-Wilmington Florida International University of California-Santa Barbara Wheaton College	University of Texas El Paso Boise State College of St. Benedict Pratt Institute Centre College University of Wisconsin Clark University Willamette University The Cooper Union
By Intended Major	
Agriculture Health Sciences & Technologies Business English & Foreign Languages Engineering Computer & Information Sciences	Sciences: Biological and Physical Social Science and Law Architecture Arts: Visual and Performing Education Community, Family & Personal Services Repair, Production & Construction

