

# Analysis of SAT Scores in New York City High Schools

## 1.0 Introduction/Business Problem

The purpose of this analysis is to determine the top 5 high schools with the highest scholastic aptitude test (SAT) scores in each New York City (NYC) borough. The intended audiences for the analysis are parents of soon-to-be or current high schoolers. This analysis is relevant to parents of soon-to-be high schoolers who intend on taking the SAT to provide guidance in determining the best high school or see if their current high school is a top SAT performer.

## 2.0 Data

The data sets used for this analysis will be the New York City Department of Education 2011 School Survey data, Kaggle NYC Schools/SAT dataset and Foursquare API. The NYC 2011 School Survey will be used to obtain the school identifier (unique school identifier), school type (high school), total number of students, school address, and borough (borough where school is located). The Kaggle NYC Schools/SAT dataset will be used to obtain various data about the high schools in NYC. This data includes SAT results, unique school identifiers, school names and addresses, total number of students, and the longitude/latitude of each high school. The Foursquare API data will be used to map the top SAT performing schools in each borough to visually display where they are located and what venues like bus stops and subway stops are nearby.

Since the data was in raw format in CVS, the data had to be cleaned. Therefore, the data was filtered for only high schools and rows that did not have SAT data were deleted. The three datasets were merged into one file for processing. Additionally, only the columns with relevant data were kept – dbn, school name, school type, borough, school address, SAT critical reading SAT avg score, SAT math avg score and SAT writing avg score. dbn was kept because it was used as unique identifier to merge and filter files. The shape of the file before filtering the high schools was 1,646 and 271 afterwards. So, there were 271 high schools in New York City in 2011.

## 3.0 Descriptive Analysis

Determine the highest average SAT scores for critical reading, writing and math across all the high schools in New York City. Generate a bar graph of the maximum average SAT score of each category grouped by borough, which displays the maximum SAT average scores in each borough.

The first step in the descriptive analysis is looking at the overall SAT average scores in all of New York City. Bar graphs were generated of each SAT category – critical reading, writing and math – for each borough. The bar graphs are show below.

Figure 3.1: Maximum SAT Critical SAT Critical Reading Average Scores by Borough

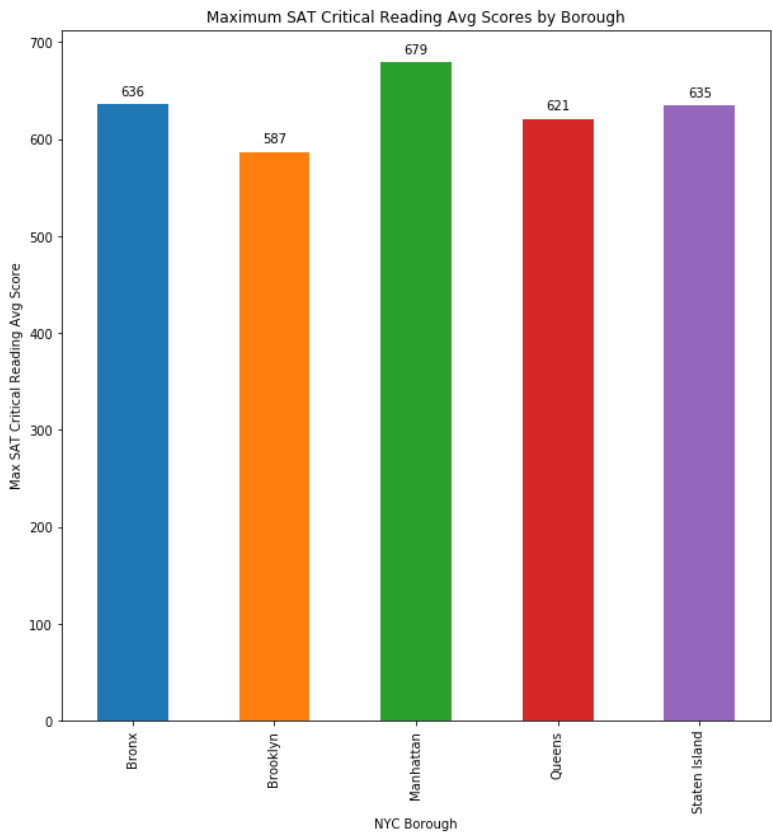


Figure 3.2: Maximum SAT Critical SAT Math Average Scores by Borough

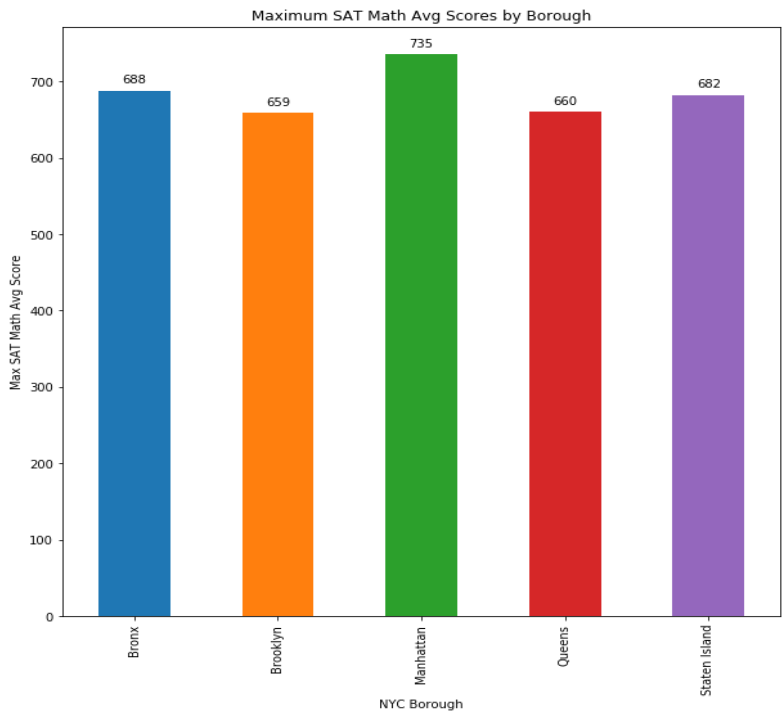
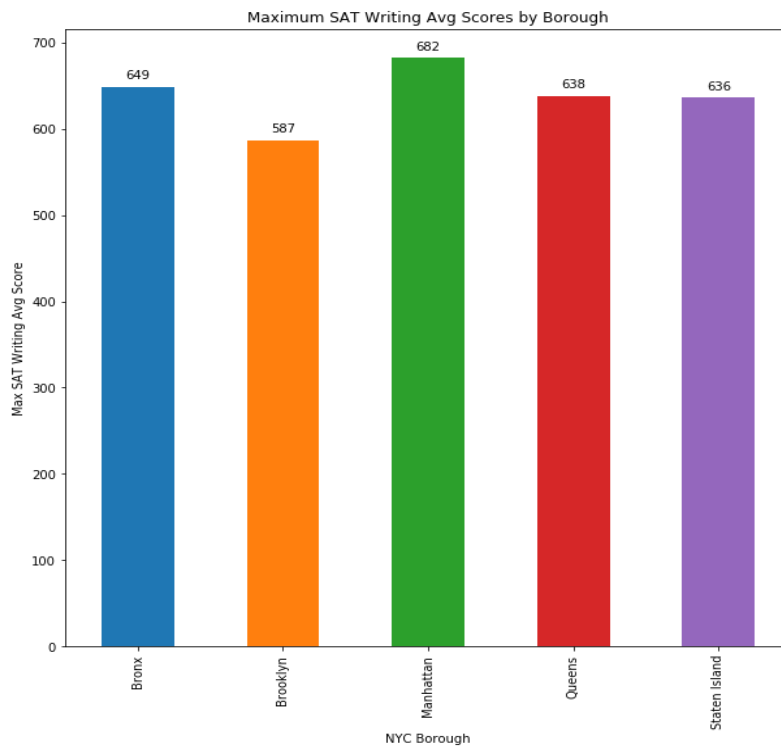


Figure 3.3: Maximum SAT Critical SAT Writing Average Scores by Borough



Looking at the bar graphs show that Manhattan borough shows the maximum average scores in all SAT categories. Additionally, most of the high schools performed approximately the same in all boroughs for all SAT categories. However, Brooklyn borough performed the lowest in all SAT categories.

Now, the next step is to determine which high school(s) within Manhattan are the top performing. The SAT category table was sorted in descending order to determine which high school was the top performer in each category. The result from the first row is shown below,

	dbn	schoolname	schooltype	borough	school_address	SAT Critical Reading Avg. Score	SAT Math Avg. Score	SAT Writing Avg. Score
27	02M475	Stuyvesant High School	High School	Manhattan	345 Chambers Street, New York, NY, 10282	679	735	682

As shown in the table, Stuyvesant High School had the highest average scores in all three SAT categories- critical reading, writing and math. Now that the top performing SAT high school is known, use

Foursquare API to investigate Stuyvesant High School. One of the descriptions from Foursquare API about Stuyvesant High School stated,

"Stuyvesant High School has been a symbol of excellence in education for over a century. Our mission is to continue and enhance that commitment by providing an environment which will nurture and enhance the special academic talents of the students admitted to Stuyvesant."

Another Foursquare API user uploaded a picture of the high school.

Figure 3.4: Stuyvesant High School, Manhattan, New York City



Now that the top performing SAT high school in New York City has been determined, a descriptive analysis of the other boroughs will be investigated. The SAT dataset is sliced for each borough, beside Manhattan, to determine the top performing SAT high schools in each. Each borough will be addressed below.

### 3.1 Determine Top SAT Performing High Schools for the Bronx

Table 3.1.1: SAT Critical Reading Average Scores for Top 5 Performing High Schools in the Bronx

borough	schoolname	SAT Critical Reading Avg. Score
Bronx	High School of American Studies at Lehman College	636
Bronx	Bronx High School of Science	632
Bronx	Bronx Center for Science and Mathematics	459
Bronx	Collegiate Institute for Math and Science	444

<b>borough</b>	<b>schoolname</b>	<b>SAT Critical Reading Avg. Score</b>
Bronx	Pelham Preparatory Academy	431

Table 3.1.2: SAT Writing Average Scores for Top 5 Performing High Schools in the Bronx

<b>borough</b>	<b>schoolname</b>	<b>SAT Writing Avg. Score</b>
Bronx	Bronx High School of Science	649
Bronx	High School of American Studies at Lehman College	636
Bronx	Bronx Center for Science and Mathematics	457
Bronx	Collegiate Institute for Math and Science	433
Bronx	Celia Cruz Bronx High School of Music, The	427

Table 3.1.3: SAT Math Average Scores for Top 5 Performing High Schools in the Bronx

<b>borough</b>	<b>schoolname</b>	<b>SAT Math Avg. Score</b>
Bronx	Bronx High School of Science	688
Bronx	High School of American Studies at Lehman College	648
Bronx	Bronx Center for Science and Mathematics	480
Bronx	Collegiate Institute for Math and Science	471
Bronx	Pelham Preparatory Academy	438

The Bronx High School of Science had the highest average scores for both writing and math and was a close second highest performer for critical reading. The highest performer for critical reading was High School of American Studies at Lehman College.

### 3.2 Determine Top SAT Performing High Schools for Brooklyn

Table 3.2.1: SAT Critical Reading Average Scores for Top 5 Performing High Schools in Brooklyn

<b>borough</b>	<b>schoolname</b>	<b>SAT Critical Reading Avg. Score</b>
Brooklyn	Brooklyn Technical High School	587
Brooklyn	Brooklyn Latin School, The	586
Brooklyn	Leon M. Goldstein High School for the Sciences	524
Brooklyn	Midwood High School	478
Brooklyn	Benjamin Banneker Academy	471

Table 3.2.2: SAT Writing Average Scores for Top 5 Performing High Schools in Brooklyn

<b>borough</b>	<b>schoolname</b>	<b>SAT Writing Avg. Score</b>
Brooklyn	Brooklyn Technical High School	587
Brooklyn	Brooklyn Latin School, The	570
Brooklyn	Leon M. Goldstein High School for the Sciences	542
Brooklyn	Midwood High School	476
Brooklyn	Edward R. Murrow High School	467

Table 3.2.3: SAT Math Average Scores for Top 5 Performing High Schools in Brooklyn

<b>borough</b>	<b>schoolname</b>	<b>SAT Math Avg. Score</b>
Brooklyn	Brooklyn Technical High School	659
Brooklyn	Brooklyn Latin School, The	584

<b>borough</b>	<b>schoolname</b>	<b>SAT Math Avg. Score</b>
Brooklyn	Leon M. Goldstein High School for the Sciences	561
Brooklyn	Midwood High School	519
Brooklyn	CITY POLYTECHNIC HIGH SCHOOL OF ENGINEERING, A...	499

Brooklyn Technical High School ranked the highest in all three categories, like Stuyvesant High School in Manhattan. The Brooklyn Latin School was the second highest ranking high school in all categories, coming in a close second in the critical reading and writing categories.

### 3.3 Determine Top SAT Performing High Schools for Queens

Table 3.3.1: SAT Critical Reading Average Scores for Top 5 Performing High Schools in Queens

<b>borough</b>	<b>schoolname</b>	<b>SAT Critical Reading Avg. Score</b>
Queens	Townsend Harris High School	621
Queens	Queens High School for the Sciences at York Colle	612
Queens	Bard High School Early College II	545
Queens	Frank Sinatra School of the Arts High School	504
Queens	Academy of American Studies	487

Table 3.3.2: SAT Writing Average Scores for Top 5 Performing High Schools in Queens

<b>borough</b>	<b>schoolname</b>	<b>SAT Writing Avg. Score</b>
Queens	Townsend Harris High School	638
Queens	Queens High School for the Sciences at York Colle	596

<b>borough</b>	<b>schoolname</b>	<b>SAT Writing Avg. Score</b>
Queens	Bard High School Early College II	550
Queens	Frank Sinatra School of the Arts High School	494
Queens	Academy of American Studies	491

Table 3.3.3: SAT Math Average Scores for Top 5 Performing High Schools in Queens

<b>borough</b>	<b>schoolname</b>	<b>SAT Math Avg. Score</b>
Queens	Queens High School for the Sciences at York Colle	660
Queens	Townsend Harris High School	651
Queens	Bard High School Early College II	568
Queens	Benjamin N. Cardozo High School	545
Queens	Francis Lewis High School	539

Townsend Harris High School was the top performer for critical reading and writing and Queens High School for the Sciences at York College performed the highest for math.

### 3.4 Determine Top SAT Performing High Schools for Staten Island

Table 3.4.1: SAT Critical Reading Average Scores for Top 5 Performing High Schools in Staten Island

<b>borough</b>	<b>schoolname</b>	<b>SAT Critical Reading Avg. Score</b>
Staten Island	Staten Island Technical High School	635
Staten Island	Tottenville High School	462
Staten Island	Susan E. Wagner High School	455



<b>borough</b>	<b>schoolname</b>	<b>SAT Critical Reading Avg. Score</b>
Staten Island	CSI High School for International Studies	452
Staten Island	Curtis High School	437

Table 3.4.2: SAT Writing Average Scores for Top 5 Performing High Schools in Staten Island

<b>borough</b>	<b>schoolname</b>	<b>SAT Writing Avg. Score</b>
Staten Island	Staten Island Technical High School	636
Staten Island	Tottenville High School	470
Staten Island	Susan E. Wagner High School	459
Staten Island	CSI High School for International Studies	450
Staten Island	Curtis High School	429

Table 3.4.3: SAT Math Average Scores for Top 5 Performing High Schools in Staten Island

<b>borough</b>	<b>schoolname</b>	<b>SAT Math Avg. Score</b>
Staten Island	Staten Island Technical High School	682
Staten Island	Tottenville High School	486
Staten Island	Susan E. Wagner High School	474
Staten Island	CSI High School for International Studies	451
Staten Island	Port Richmond High School	438

Staten Island Technical High School performed the highest in all SAT categories. Unlike the other boroughs, in Staten Island, the top performing high school outperformed the other high schools.

#### 4.0 Conclusion

Analyzing average SAT scores in New York City yielded some interesting insights. Manhattan had the top performing high school, Stuyvesant High School, in all three SAT categories. On the other end of the spectrum, Brooklyn had the lowest average scoring high schools in all three SAT categories.

Three out of the five boroughs - Manhattan, Brooklyn and Staten Island - had the same high school as the top performer in all of the SAT categories. Most of the boroughs had two high schools that were the top performers in all three SAT categories.

Staten Island was the only borough whose top performing high school outperformed the second highest performing high school.