

## **Locating A Suitable Place of A Student in NYC**

### **Capstone Project - The Battle of the Neighborhoods Applied Data Science Capstone by IBM/Coursera**

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#### **I. Introduction**

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##### **A. Background Information**

Scholastic Assessment Test (SAT) is a standardized examination usually taken by high school juniors and seniors used for college admissions in United States. This test is conducted in order to measure literacy, numeracy and writing skills which are three important components needed for academic success in college. In addition, SAT is said to be an assessment on how well the students analyze and solve problems which are skills learned in school that is vital in college. However, the test is administered under time constraint in order to help produce a range of scores.

With future as the biggest consequence of this assessment specially for incoming college students, it is important for parents to consider which accredited high school would help students achieve the needed skills to be learned as preparation for college. Preferably, parents want to know which public high school's students received the highest overall SAT score and which borough has the highest performing schools. This will serve as a guide for them in order to select the best school for their children in the hope of a bright future.

##### **B. Business Problem**

The average SAT scores for NYC public schools dataset from Kaggle provides a rich data compilation of average scores on each SAT test section for the 2014-2015 school year.

This project aims to help parents select which area or borough in NYC is recommended for high performance on SAT, explore the neighborhoods of that borough to find the most venues in each neighborhood that may affect the life of the students and cluster the neighborhoods using k-mean clustering.

##### **C. Target Interest**

The project is intended for parents who are considering which borough they are to select with the highest satisfactory performance on SAT. In addition, check the public high school in that area they can consider to be the next home of their children and what are the most common venues on that boroughs that will certainly affect the life of the students.

## II. Data Definition and Cleaning

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### A. Data Definition

The dataset to be used came from Kaggle, Average SAT Scores for NYC Public Schools.

Link: <https://www.kaggle.com/nycopendata/high-schools>

This dataset consists of a row for every accredited high school in New York City with the following attributes:

- School ID: The unique id of the school
- School Name: The name of the school
- Borough: Common name for NYC borough
- Building Code: The unique identifier of the building
- Street Address: The specific address
- City: The city where school is located
- State: NYC
- Zip Code: The address zipcode
- Latitude: The latitude of the location
- Longitude: The longitude of the location
- Phone Number: The school's phone number
- Start Time: Start of classes
- End Time: End of classes
- Student Enrollment: No. of enrollment for the school year
- Percent White: Percent of white from the total population
- Percent Black: Percent of black from the total population
- Percent Hispanic: Percent of hispanic from the total population
- Percent Asian: Percent of asian from the total population
- Average Score (SAT Math): Average score in Math
- Average Score (SAT Reading): Average score in Reading
- Average Score (SAT Writing): Average score in Writing
- Percent Tested: Percent of the sample tested from the whole

population

This data will be used to describe the different goals of the project such as which borough they are to select with the highest satisfactory performance on SAT and check the public high school in that area they can consider to be the next home of their children.

In order to determine the most common venues for each neighborhood on the most desired boroughs that will certainly affect the life of the students, the final dataset will be used to fetch data using the Foursquare API and then using k-means clustering algorithm to cluster similar neighborhoods.

## B. Data Cleaning

	School_ID	School_Name	Borough	Building_Code	Street_Address	City	State	Zip_Code	Latitude	Longitude	Phone_Number	Start_Time	End_Time
0	02M260	Clinton School Writers and Artists	Manhattan	M933	425 West 33rd Street	Manhattan	NY	10001	40.75321	-73.99786	212-695-9114	NaN	NaN
1	06M211	Inwood Early College for Health and Informatio...	Manhattan	M052	650 Academy Street	Manhattan	NY	10002	40.86605	-73.92486	718-935-3660	8:30 AM	3:00 PM
2	01M539	New Explorations into Science, Technology and ...	Manhattan	M022	111 Columbia Street	Manhattan	NY	10002	40.71873	-73.97943	212-677-5190	8:15 AM	4:00 PM
3	02M294	Essex Street Academy	Manhattan	M445	350 Grand Street	Manhattan	NY	10002	40.71687	-73.98953	212-475-4773	8:00 AM	2:45 PM
4	02M308	Lower Manhattan Arts Academy	Manhattan	M445	350 Grand Street	Manhattan	NY	10002	40.71687	-73.98953	212-505-0143	8:30 AM	3:00 PM

Fig 1. Sample Dataset After Cleaning

## III. Methodology

### A. Exploratory Data Analysis

#### a. Descriptive Statistics of SAT

	Ave_SAT_Score_Math	Ave_SAT_Score_Reading	Ave_SAT_Score_Writing	Ave_SAT_Score_Overall
count	375.000000	375.000000	375.000000	375.000000
mean	432.944000	424.504000	418.458667	1275.906667
std	71.952373	61.881069	64.548599	194.906283
min	317.000000	302.000000	284.000000	924.000000
25%	386.000000	386.000000	382.000000	1157.000000
50%	415.000000	413.000000	403.000000	1226.000000
75%	458.500000	445.000000	437.500000	1330.500000
max	754.000000	697.000000	693.000000	2144.000000

Fig 2. Descriptive Statistics of SAT

SAT has three sections (Math, Reading, and Writing) worth 800 points each with a maximum total score of 2400. In the dataset used, the mean of public school SAT score is 1275 and the median is 1226, meaning the distribution is skewed slightly to the right with more high-scoring outliers. Significantly, the highest average score is attained in Math and the lowest average score is Writing. All scores on each section is skewed slightly to the right with more high-scoring outliers.

## b. Top 15 Schools with the Highest Overall SAT Scores

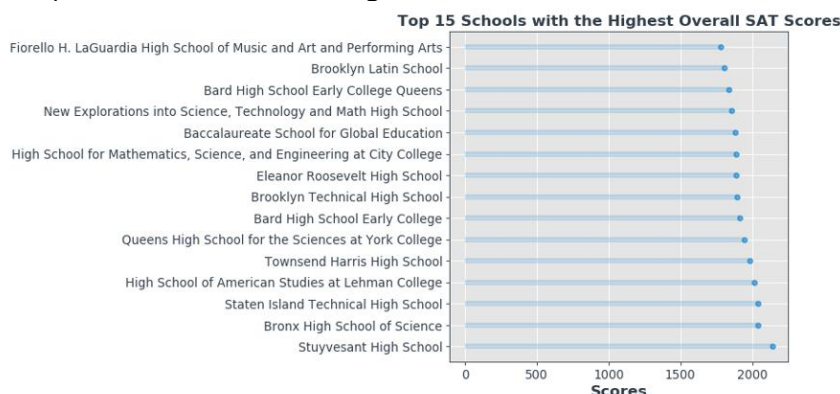


Fig 3. Top 15 Schools on Overall SAT Score

Overall, the top three performing schools are: Stuyvesant High School, Bronx High School of Science and Staten Island Technical High School.

## c. Top 15 Schools with the Highest SAT Scores on each Area

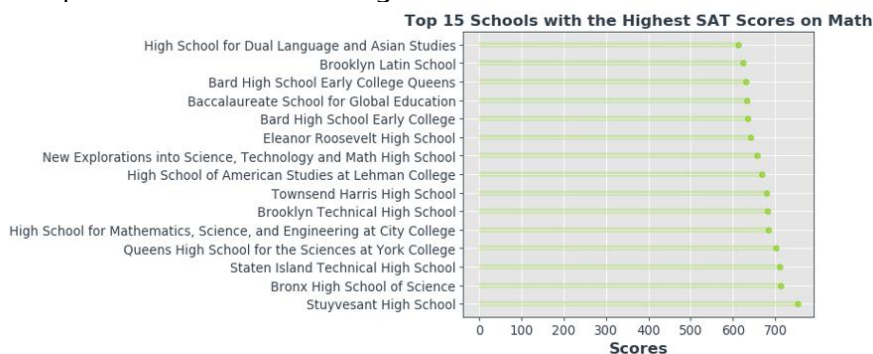


Fig 4. Top 15 Schools on Math SAT Score

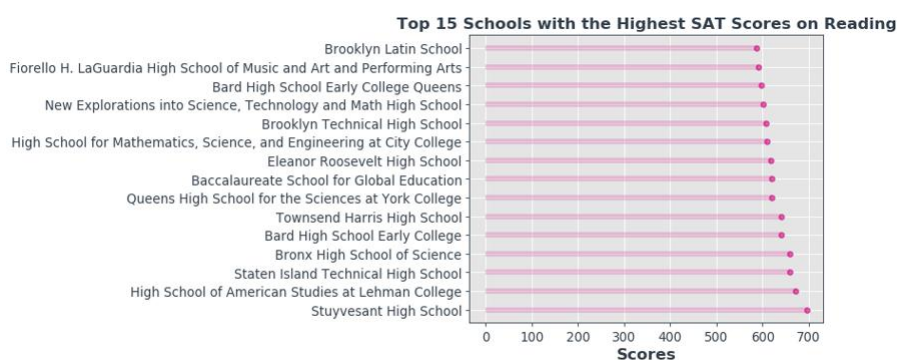


Fig 5. Top 15 Schools on Reading SAT Score

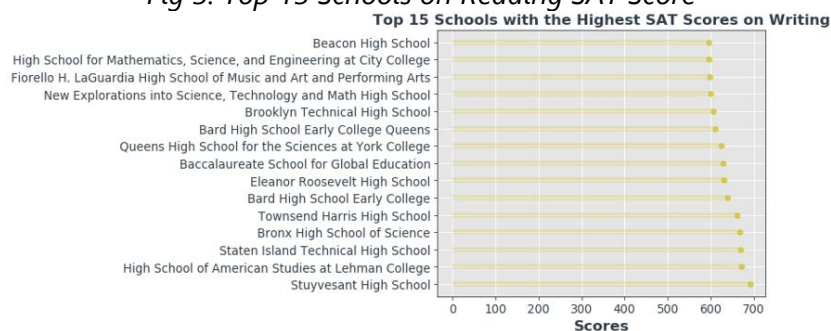


Fig 6. Top 15 Schools on Writing SAT Score

For the Math Section, the top 3 public high school with the highest scores are still: Stuyvesant High School, Bronx High School of Science and Staten Island Technical High School. On the other hand, High School of American Studies at Lehman College claimed the top 2 spot for Reading and Writing Section while Stuyvesant High School remain at the top spot. Bronx High School of Science and Staten Island Technical High School claimed the top 3 and 4 spot for the said section.

d. Location of the the Top 5 Schools for Overall and Each Section

Overall:	School_Name	Borough
105	Stuyvesant High School	Manhattan
203	Bronx High School of Science	Bronx
110	Staten Island Technical High School	Staten Island
208	High School of American Studies at Lehman College	Bronx
385	Townsend Harris High School	Queens
Math Section:	School_Name	Borough
105	Stuyvesant High School	Manhattan
203	Bronx High School of Science	Bronx
110	Staten Island Technical High School	Staten Island
424	Queens High School for the Sciences at York Co...	Queens
80	High School for Mathematics, Science, and Engi...	Manhattan
Reading Section:	School_Name	Borough
105	Stuyvesant High School	Manhattan
208	High School of American Studies at Lehman College	Bronx
110	Staten Island Technical High School	Staten Island
203	Bronx High School of Science	Bronx
7	Bard High School Early College	Manhattan
Writing Section:	School_Name	Borough
105	Stuyvesant High School	Manhattan
208	High School of American Studies at Lehman College	Bronx
110	Staten Island Technical High School	Staten Island
203	Bronx High School of Science	Bronx
385	Townsend Harris High School	Queens

The top school is located at Manhattan. On the other hand, some of schools that claimed the top spots are located at Bronx, Staten Islands and Queens.

e. Average Overall SAT Scores per Borough

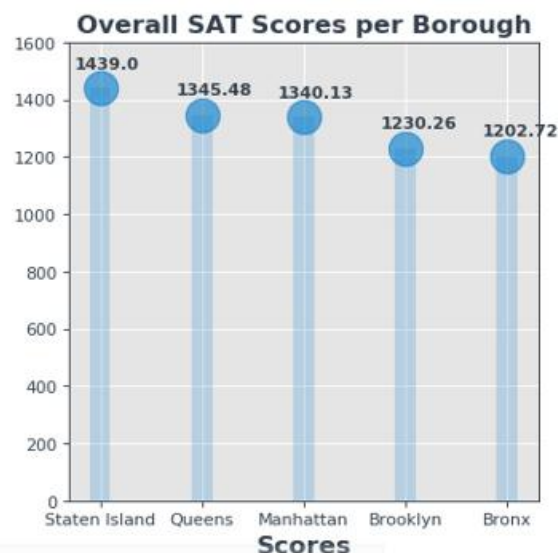
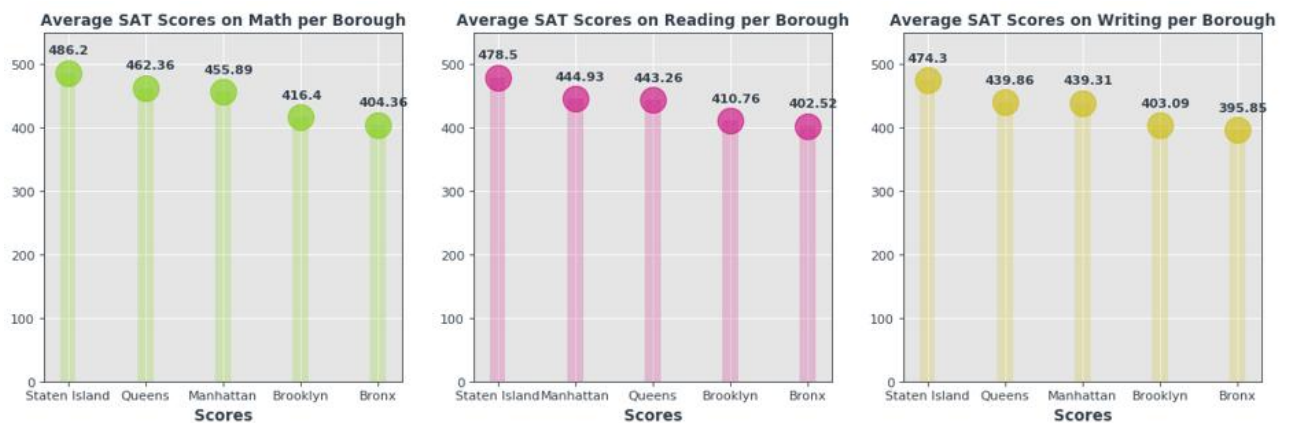


Fig 7. Average Overall SAT Scores per Borough

Even though the top school is located at Manhattan, in terms of average score per borough, it seems that public schools at Staten Islands have the consistent high performance. It is followed by Queens and Manhattan. On the other hand, Bronx seems to have the lowest scores in SAT.

f. Average SAT Scores on each Section per Borough



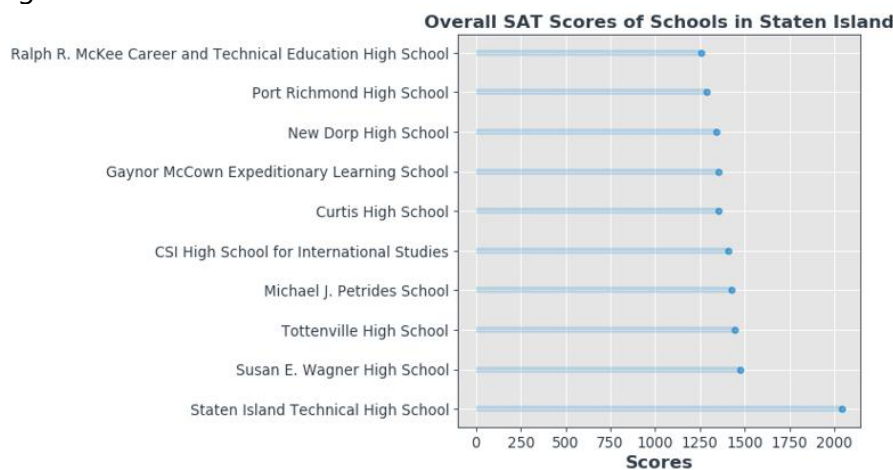
*Fig 8. Average SAT Scores on each Section per Borough*

From the figure above, it is very consistent that public schools at Staten Islands have the highest scores across each section of SAT even though the top school is located at Manhattan. On the other hand, Bronx still has the lowest scores across each section of SAT.

Since it is Staten Island that has the highest scores on SAT, we will focus more on the neighborhoods of this borough. The list of Neighborhoods in the Staten Island was found on this Wikipedia page:

[https://en.wikipedia.org/wiki/List\\_of\\_Staten\\_Island\\_neighborhoods](https://en.wikipedia.org/wiki/List_of_Staten_Island_neighborhoods)

g. The Staten Island



*Fig 9. Average SAT Scores on each School in Staten Island*

The top performing school at Staten Island is Staten Island Technical School which is also part of the Top 3 Performing School in the whole New York City.



#### h. The Neighborhood at Staten Island

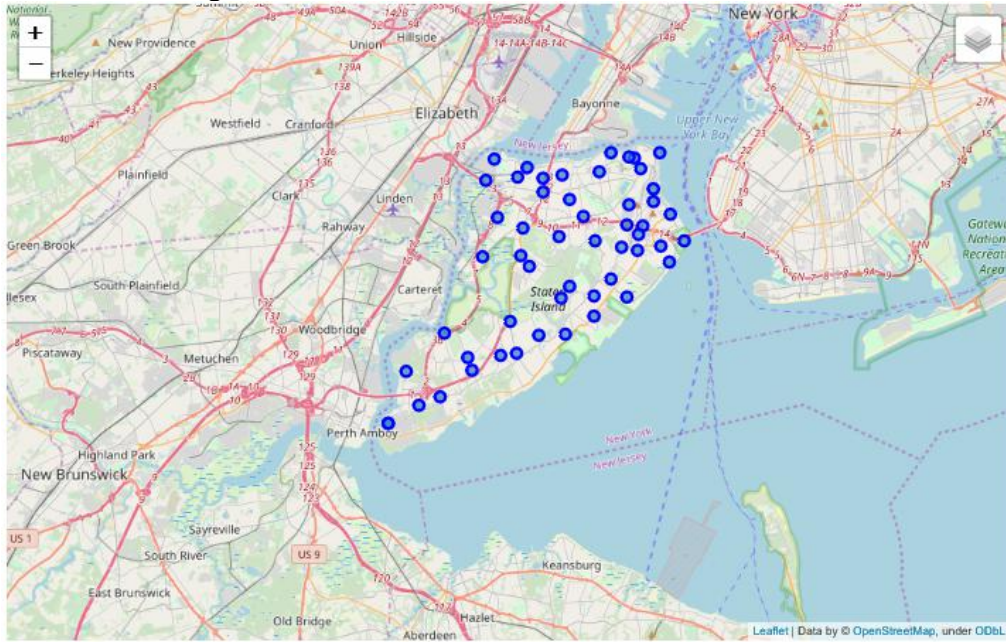


Fig 10. Map of the Neighborhood at Staten Island

### B. Modelling

In order to find out the most common venues around the neighborhood that may affect the school life of students, here are the steps to be taken.

- Find all the venues within the 500 meter radius of each neighborhood.
- Perform one hot encoding on the venues data for modelling.
- Group the venues by the neighborhood and compute their mean.
- Perform K-means clustering to attained clusters.

After finding all the venues around the different neighborhood in Staten Island, conducting the data wrangling and arriving to the final dataset, elbow method was used to identify the optimal number of clusters before implementing clustering.

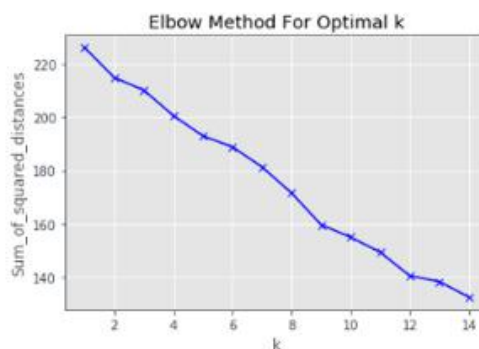


Fig 11. Scree Plot for the Optimal Number of Clusters

From the graph above, it can be seen that the elbow was found at  $k=9$ . Therefore we set the number of clusters to 9.

After implementing the the clustering algorithm, here is the visualization of the clusters on the map. Colors of the same represents the clusters.

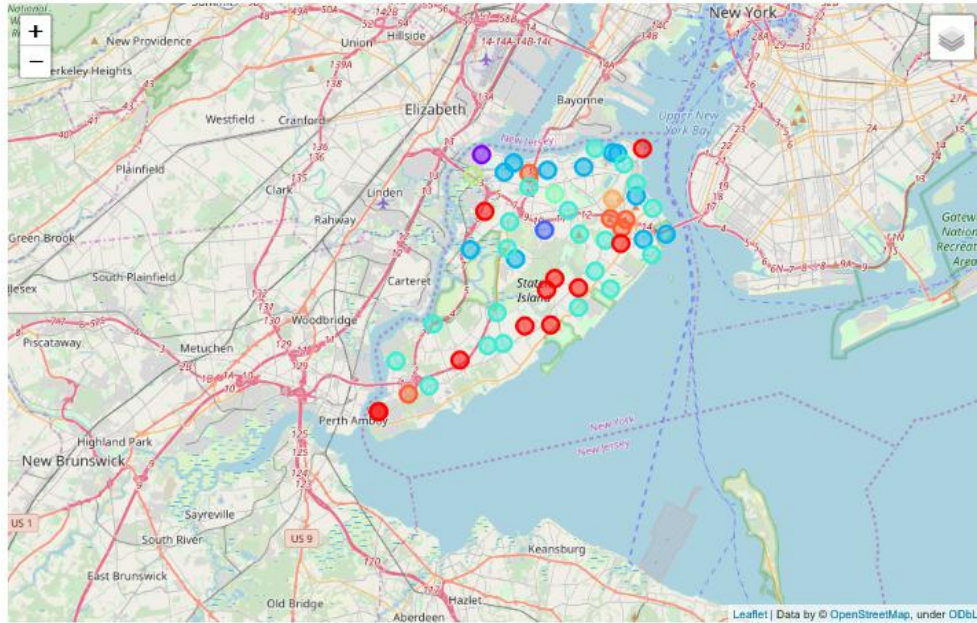


Fig 11. Map of the Neighborhood at Staten Island with Clusters

## IV. Cluster Analysis

### A. Cluster 0 ( Dining and Leisure Place)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
3	Bay Terrace	Staten Island	40.555278	-74.134167	0.0	Food Truck	American Restaurant	Playground	Italian Restaurant	Performing Arts Venue	Train Station	Shopping Mall	Electronics Store
4	Bloomfield	Staten Island	40.612604	-74.178200	0.0	Hotel	Department Store	Spa	Italian Restaurant	Video Store	Cocktail Bar	Candy Store	Tea Room
11	Egberville	Staten Island	40.578622	-74.131570	0.0	Cosmetics Shop	Italian Restaurant	Massage Studio	Trail	Bagel Shop	Dim Sum Restaurant	Diner	Food
19	Great Kills	Staten Island	40.554272	-74.151532	0.0	Pizza Place	Italian Restaurant	Bar	Bagel Shop	Spanish Restaurant	Bus Stop	Falafel Restaurant	Chinese Restaurant
24	Huguenot	Staten Island	40.537328	-74.194588	0.0	Movie Theater	Italian Restaurant	Nightlife Spot	Yoga Studio	Elementary School	Flower Shop	Filipino Restaurant	Fast Food Restaurant
28	New Dorp	Staten Island	40.573994	-74.115976	0.0	Italian Restaurant	Deli / Bodega	Indian Restaurant	Taco Place	Gas Station	Mexican Restaurant	Flower Shop	Dim Sum Restaurant
32	Old Town	Staten Island	40.596268	-74.087592	0.0	Italian Restaurant	Pizza Place	Jewelry Store	Pharmacy	Mattress Store	Gas Station	Liquor Store	Restaurant
38	Richmondtown	Staten Island	40.572882	-74.137366	0.0	Spa	History Museum	Italian Restaurant	Art Museum	Bagel Shop	Café	Massage Studio	Event Space
41	Saint George	Staten Island	40.643963	-74.073442	0.0	Clothing Store	Italian Restaurant	Sporting Goods Shop	Bar	Coffee Shop	Tapas Restaurant	Deli / Bodega	Pharmacy
46	Tottenville	Staten Island	40.511217	-74.249312	0.0	Pizza Place	American Restaurant	Ice Cream Shop	Deli / Bodega	Italian Restaurant	Train Station	Park	Bagel Shop
47	Tottenville Beach	Staten Island	40.511217	-74.249312	0.0	Pizza Place	American Restaurant	Ice Cream Shop	Deli / Bodega	Italian Restaurant	Train Station	Park	Bagel Shop

The first cluster has the second to the highest number of Neighborhood. Most of the common venues are food related places such as food trucks, restaurants and pizza place. In addition, other common venues includes, playgrounds, bar and department store. Therefore, this cluster can be known as "Dining and Leisure Place".



## B. Cluster 1 (Pragmatic District)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
34	Port Ivory	Staten Island	40.840937	-74.180144	1.0	Locksmith	Yoga Studio	Food	Flower Shop	Filipino Restaurant	Fast Food Restaurant	Farmers Market	Falsafel Restaurant

Most common venue for the second cluster is a locksmith place. Thus, it can be named as the "Pragmatic District".

## C. Cluster 2 (Food District)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
51	Willowbrook	Staten Island	40.80316	-74.138476	2.0	Bus Stop	Café	Yoga Studio	Food	Flower Shop	Filipino Restaurant	Fast Food Restaurant	Farmers Market

Different restaurants, cafe and markets are the most common venues in the third cluster. Therefore, it can be known as the "Food District".

## D. Cluster 3 (Travel Friendly Place)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
1	Arlington	Staten Island	40.832328	-74.165144	3.0	Bus Stop	Deli / Bodega	American Restaurant	Home Service	Supermarket	Event Space	Food	Flower Shop
2	Arrochar	Staten Island	40.598438	-74.072841	3.0	Pizza Place	Bus Stop	Deli / Bodega	Bagel Shop	Elementary School	Food	Flower Shop	Filipino Restaurant
8	Clifton	Staten Island	40.620104	-74.077086	3.0	Bus Stop	Deli / Bodega	Discount Store	Baseball Field	Chinese Restaurant	Train Station	Grocery Store	Intersection
15	Fort Wadsworth	Staten Island	40.800763	-74.057639	3.0	Hotel	Historic Site	Bus Stop	Lighthouse	Elementary School	Food	Flower Shop	Filipino Restaurant
22	Hamilton Park	Staten Island	40.841726	-74.090072	3.0	Bus Stop	Deli / Bodega	Park	Restaurant	Playground	Mexican Restaurant	Garden Center	Chinese Restaurant
23	Heartland Village	Staten Island	40.588333	-74.157778	3.0	Bus Station	Bus Stop	Sandwich Place	Gym / Fitness Center	Yoga Studio	Elementary School	Flower Shop	Filipino Restaurant
25	Mariners Harbor	Staten Island	40.838770	-74.158755	3.0	Grocery Store	American Restaurant	Coffee Shop	Bus Stop	Nightlife Spot	Yoga Studio	Flower Shop	Filipino Restaurant
27	New Brighton	Staten Island	40.842326	-74.092919	3.0	Bus Stop	Bar	Deli / Bodega	Playground	Mexican Restaurant	Park	Restaurant	Donut Shop
35	Port Richmond	Staten Island	40.833159	-74.136532	3.0	Bus Stop	Pizza Place	Martial Arts Dojo	Ice Cream Shop	Deli / Bodega	Supermarket	Laundry Service	Basketball Court
48	Travis	Staten Island	40.593160	-74.187922	3.0	Spanish Restaurant	Park	Bus Stop	Steakhouse	Sandwich Place	Baseball Field	Elementary School	Filipino Restaurant
50	West New Brighton	Staten Island	40.834548	-74.112087	3.0	Bus Stop	Pizza Place	Convenience Store	Bar	Cosmetics Shop	Chinese Restaurant	Seafood Restaurant	Breakfast Spot

It is very apparent that the most common venue in the fourth cluster are bus stops and convenience stores. Thus, this cluster can be called the "Travel Friendly Place"

## E. Cluster 4 (All Around District)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
0	Annadale	Staten Island	40.544550	-74.176532	4.0	Pizza Place	Restaurant	American Restaurant	Cosmetics Shop	Food	Park	Liquor Store	Sports Bar
5	Bulls Head	Staten Island	40.607048	-74.162088	4.0	Baseball Field	Pharmacy	Diner	Bus Stop	Food Truck	Playground	Convenience Store	Coffee Shop
6	Castleton Corners	Staten Island	40.613160	-74.122365	4.0	Ice Cream Shop	Pizza Place	Bank	Deli / Bodega	Cosmetics Shop	Beer Garden	Diner	Convenience Store
7	Charleston	Staten Island	40.536772	-74.237367	4.0	German Restaurant	Deli / Bodega	Music Venue	Recreation Center	Rental Car Location	Restaurant	Bakery	Liquor Store
10	Dongan Hills	Staten Island	40.597927	-74.098027	4.0	Pizza Place	Asian Restaurant	Diner	Bagel Shop	Yoga Studio	Elementary School	Food	Flower Shop
13	Eltingville	Staten Island	40.546383	-74.165699	4.0	Sushi Restaurant	Pizza Place	Fast Food Restaurant	Bank	Pharmacy	Diner	Sandwich Place	Restaurant
16	Graniteville	Staten Island	40.624826	-74.148477	4.0	Diner	Pizza Place	Fast Food Restaurant	Playground	Sushi Restaurant	Convenience Store	Pet Store	Donut Shop
17	Grant City	Staten Island	40.582049	-74.104984	4.0	Convenience Store	Pharmacy	Rental Car Location	BBQ Joint	Bank	Yoga Studio	Electronics Store	Flower Shop
20	Greenridge	Staten Island	40.581224	-74.169885	4.0	Bagel Shop	Pizza Place	Sandwich Place	Asian Restaurant	Coffee Shop	Pet Store	Pharmacy	Diner
26	Midland Beach	Staten Island	40.573161	-74.094586	4.0	Deli / Bodega	Restaurant	Bus Stop	Baseball Field	Pet Store	Dessert Shop	Home Service	Electronics Store
29	New Springville	Staten Island	40.593438	-74.163199	4.0	Pizza Place	Coffee Shop	Mobile Phone Shop	Bus Stop	Bagel Shop	Accessories Store	Sandwich Place	Mexican Restaurant
30	Oakwood	Staten Island	40.563994	-74.115975	4.0	Pharmacy	Bus Stop	Smoke Shop	Burger Joint	Supplement Shop	Furniture / Home Store	Business Service	Sandwich Place
33	Pleasant Plains	Staten Island	40.523994	-74.215700	4.0	Donut Shop	Pizza Place	Cosmetics Shop	Bank	Fast Food Restaurant	Other Repair Shop	Discount Store	Deli / Bodega
36	Randall Manor	Staten Island	40.644199	-74.104576	4.0	Museum	Garden	Dance Studio	Baseball Field	Cultural Center	Concert Hall	Park	Event Space

The fifth cluster has a good mixed of different venues such as food place, stores, fields for recreational activities, banks, parks and more. In addition it is the largest cluster of 19 neighborhoods. Therefore, it can be known as the "All Around District".

## F. Cluster 5 (Technohub)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
49	Westerleigh	Staten Island	40.621215	-74.131809	5.0	Arcade	Yoga Studio	Electronics Store	Food	Flower Shop	Filipino Restaurant	Fast Food Restaurant	Farmers Market

The sixth cluster is mainly electronic stores and arcades. This cluster seems more advanced than the other cluster, making it a "Technohub".

## G. Cluster 6 (Recreational Place)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
31	Old Place	Staten Island	40.630381	-74.185978	6.0	Toll Plaza	Harbor / Marina	Park	Dry Cleaner	Flower Shop	Filipino Restaurant	Fast Food Restaurant	Farmers Market

The seventh cluster is mainly for those who are seeking peace to reflect on place such as harbor and park. Thus, it can be called the "Recreational Place".

## H. Cluster 7 (Physical Activity District)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
21	Grymes Hill	Staten Island	40.618715	-74.093475	7.0	Dance Studio	Trail	Golf Course	Gym	Dessert Shop	Dim Sum Restaurant	Flower Shop	Filipino Restaurant

The second to the last cluster is mainly for those who are looking for physical activities for it is comprised of dance studios, trails, golf courses and gyms. We call it the "Physical Activity District".

## I. Cluster 8 (Deli Place)

	Neighborhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
9	Concord	Staten Island	40.808160	-74.084308	8.0	Deli / Bodega	Automotive Shop	Park	Bus Stop	Food Truck	Pizza Place	Supermarket	Gym / Fitness Center
12	Elm Park	Staten Island	40.831493	-74.148754	8.0	Deli / Bodega	Italian Restaurant	Athletics & Sports	Bus Stop	Elementary School	Food	Flower Shop	Filipino Restaurant
14	Emerson Hill	Staten Island	40.808585	-74.094554	8.0	Deli / Bodega	Pharmacy	Automotive Shop	Elementary School	Food	Flower Shop	Filipino Restaurant	Fast Food Restaurant
18	Grasmere	Staten Island	40.804271	-74.087086	8.0	Deli / Bodega	Cosmetics Shop	Gym / Fitness Center	Peruvian Restaurant		Park	Bus Stop	Pizza Place
37	Richmond Valley	Staten Island	40.520105	-74.229311	8.0	Food	Bank	Deli / Bodega	Smoothie Shop	Train Station	Bus Stop	Flower Shop	Filipino Restaurant

The last cluster is mainly composed of deli/bodega venues. Therefore, it is the "Deli Place".

## V. Results and Discussion

The aim of this project is to help parents identify which borough in NYC is ideal for their children to be their next home for a satisfactory performance in SAT. From the data that was studied, although the top performing school for overall and across NYC was Stuyvesant High School located at Manhattan, when it comes to the performance per borough, it seems that schools at Staten Island are more consistent in achieving satisfactory performance on SAT both overall and across sections (Math, Reading and Writing). In addition Staten Island Technical High School, which also is included in the Top 3 Schools with high performance in SAT is located in this area. Thus, we focused more on studying the neighborhood of this borough.

Another goal of this project is to identify which area/neighborhood on the borough is suitable for students based on the most common venues on each clustered neighborhood for it will greatly affect the student life of students. Nine (9) clusters were generated namely:

- Dining and Leisure Place
- Pragmatic District
- Food District
- Travel Friendly Place
- All Around District
- Technohub
- Recreational Place
- Physical Activity District
- Deli Place

The most ideal place for students is the All Around District for it is comprised of good mixed of different venues such as food place, stores, fields for recreational activities, banks, parks and more. Other options would be, the Technohub for those who are seeking advancement and technology lovers or Physical Activity District for parents who want their children to be physically active or learn dancing and sports.

## **VI. Conclusion**

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The project provided a means for parents to select which borough in NYC has more consistent satisfactory score in SAT and is most suitable to shelter their children for a brighter future ahead of them since SAT is a tool for college applications. It also helps in finding a comfortable neighborhood for a student depending on the most common venues located in the place which will greatly affect the students' life. In the future, this project can consider other factors such as cost of living in the areas, demographics and safety on the location for finding the most suitable area to live for a student.