



CAPSTONE PROJECT – THE BATTLE OF NEIGHBOURHOODS (WEEK 2)

**THE BEST PLACE TO LOCATE BUS STOP
IN NEW YORK CITY, NY**



Introduction

- There are many transports and high density population in New York City, NY
- It is not easy to find best bus stop to improve public transport

BUSINESS PROBLEM

Public transport wants to optimize bus service for people. If more bus stations are, it may cause traffic on the road, if there are less bus stations, it may not be comfortable for people. In order to optimize the schedule of the bus transport, it needs to find the most appropriate place where people use more and less traffic. That's why it is important to find a data scientific solution.



DATA SELECTION

- To identify how many bus stations and their locations
- We then used Google Map API to find their geographic coordinates based on their postal code addresses.
- In NY, there is 1711 bus stations currently.



DATA SELECTION

- Next, we also used Google Map API to find their geographic coordinates of the 5 locations shortlisted for bus stations:



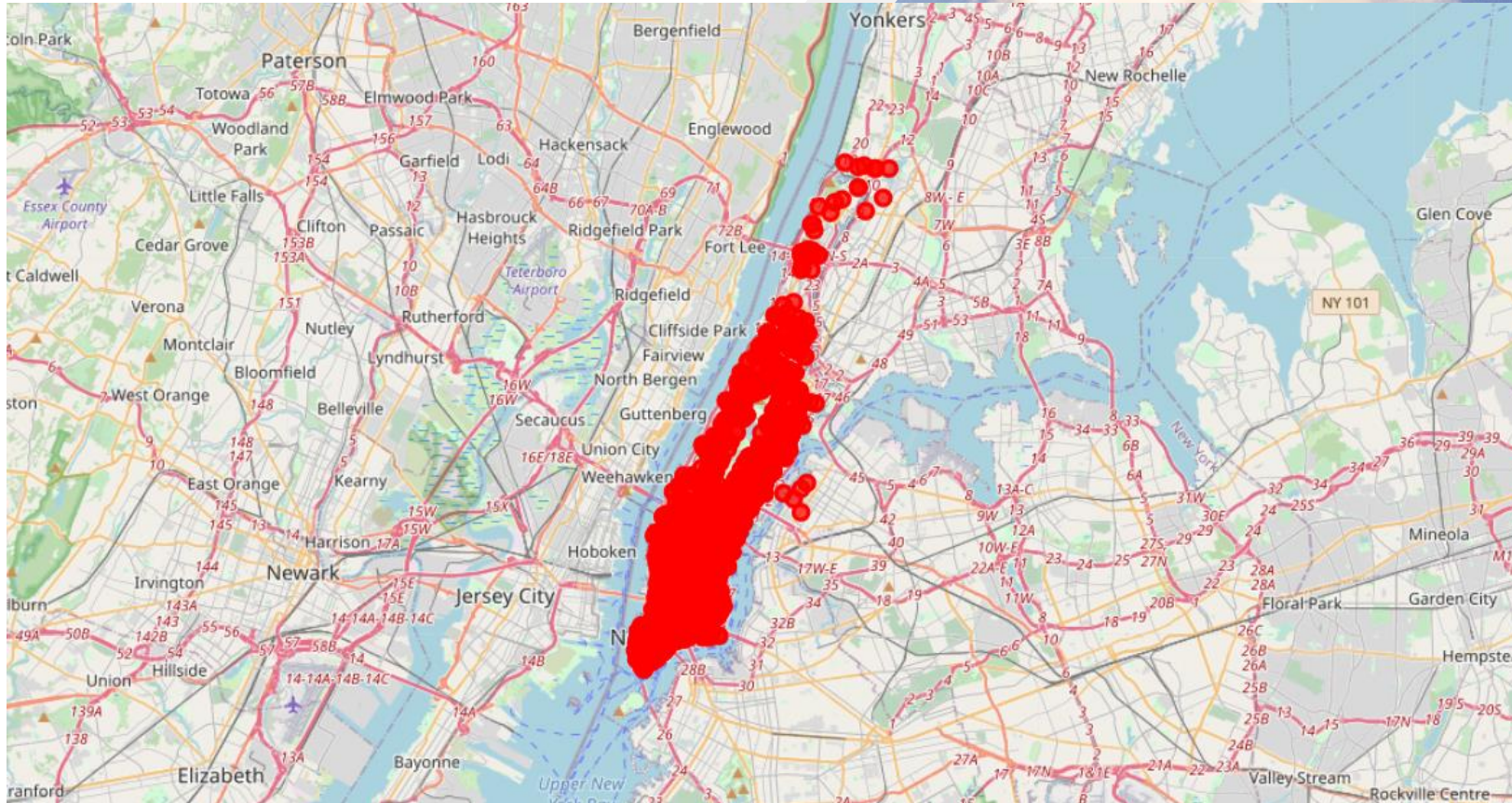
	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.91066	Tibbett & W 230Th St Mta Bus Stop	40.879627	-73.909990	Bus Stop
1	Marble Hill	40.876551	-73.91066	MTA New York City Bus & Bus Company - Bx10/Bx2...	40.879444	-73.912384	Bus Stop
2	Marble Hill	40.876551	-73.91066	MTA Bus - M100/Bx7/Bx20/BxM1 @ Broadway & W. 2...	40.872234	-73.912636	Bus Stop
3	Marble Hill	40.876551	-73.91066	mta bus stop #100705 (Independance AVE &Henry ...	40.880829	-73.918971	Bus Stop
4	Marble Hill	40.876551	-73.91066	MTA Bus - Bx1/Bx1LTD/Bx7/Bx10 @ W. 231st St & ...	40.878803	-73.904570	Bus Stop

METHODOLOGY

- Addresses are converted into their equivalent latitude and longitude values.
- Foursquare API is used to explore neighborhoods in NY.
- After that, explore function to get bus stop categories in each neighborhood.



METHODOLOGY



METHODOLOGY

- Then using this feature to group the neighborhoods into clusters K-means clustering algorithm will be use to complete this task. And also, the Folium library to visualize the neighborhoods in NY and its emerging clusters.



	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
0	Manhattan	Marble Hill	40.876551	-73.910660	2	Bus Stop	General Travel	Bus Station	Bus Line
1	Manhattan	Chinatown	40.715618	-73.994279	0	Bus Stop	Bus Line	General Travel	Bus Station
2	Manhattan	Washington Heights	40.851903	-73.936900	2	Bus Stop	General Travel	Bus Station	Bus Line
3	Manhattan	Inwood	40.867684	-73.921210	2	Bus Stop	General Travel	Bus Station	Bus Line
4	Manhattan	Hamilton Heights	40.823604	-73.949688	2	Bus Stop	General Travel	Bus Station	Bus Line

RESULTS

Cluster 1

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
14	Clinton	Bus Stop	Bus Line	General Travel	Bus Station
30	Carnegie Hill	Bus Stop	Bus Line	Bus Station	General Travel
35	Turtle Bay	Bus Stop	Bus Line	General Travel	Bus Station
36	Tudor City	Bus Stop	Bus Line	General Travel	Bus Station
39	Hudson Yards	Bus Stop	Bus Line	General Travel	Bus Station

Cluster 2

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
0	Marble Hill	Bus Stop	General Travel	Bus Station	Bus Line
2	Washington Heights	Bus Stop	General Travel	Bus Station	Bus Line
3	Inwood	Bus Stop	General Travel	Bus Station	Bus Line
4	Hamilton Heights	Bus Stop	General Travel	Bus Station	Bus Line
5	Manhattanville	Bus Stop	General Travel	Bus Station	Bus Line
6	Central Harlem	Bus Stop	General Travel	Bus Station	Bus Line
13	Lincoln Square	Bus Stop	General Travel	Bus Station	Bus Line
18	Greenwich Village	Bus Stop	General Travel	Bus Station	Bus Line
20	Lower East Side	Bus Stop	General Travel	Bus Station	Bus Line
21	Tribeca	Bus Stop	General Travel	Bus Station	Bus Line
22	Little Italy	Bus Stop	General Travel	Bus Station	Bus Line
24	West Village	Bus Stop	General Travel	Bus Station	Bus Line
29	Financial District	Bus Stop	General Travel	Bus Station	Bus Line
32	Civic Center	Bus Stop	General Travel	Bus Station	Bus Line
37	Stuyvesant Town	Bus Stop	General Travel	Bus Station	Bus Line

RESULTS

Cluster 3

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
8	Upper East Side	Bus Stop	Bus Line	Bus Station	General Travel
9	Yorkville	Bus Stop	Bus Station	Bus Line	General Travel
10	Lenox Hill	Bus Stop	Bus Station	Bus Line	General Travel

Cluster 4

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
11	Roosevelt Island	Bus Stop	Bus Line	General Travel	Bus Station

RESULTS

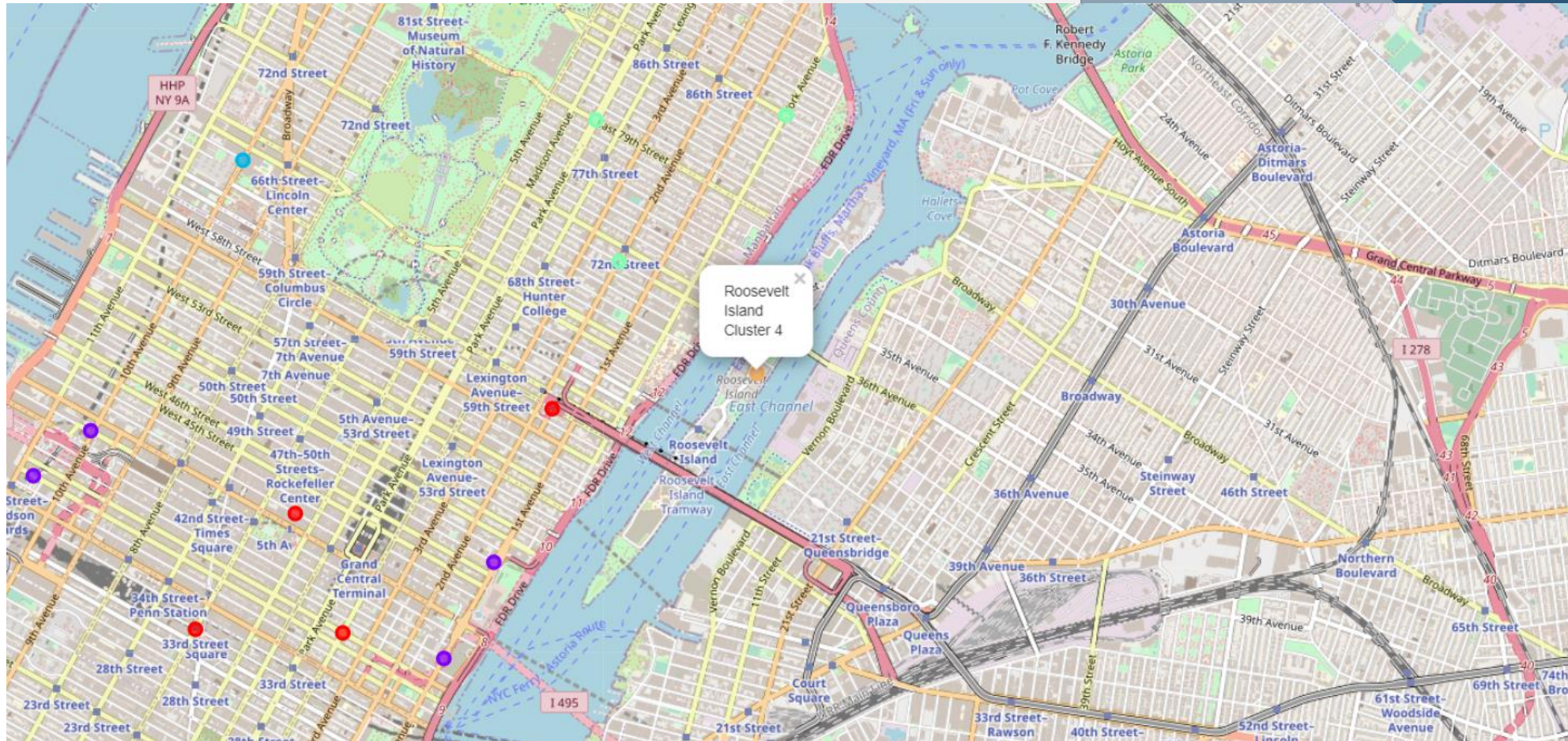
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Cluster 4

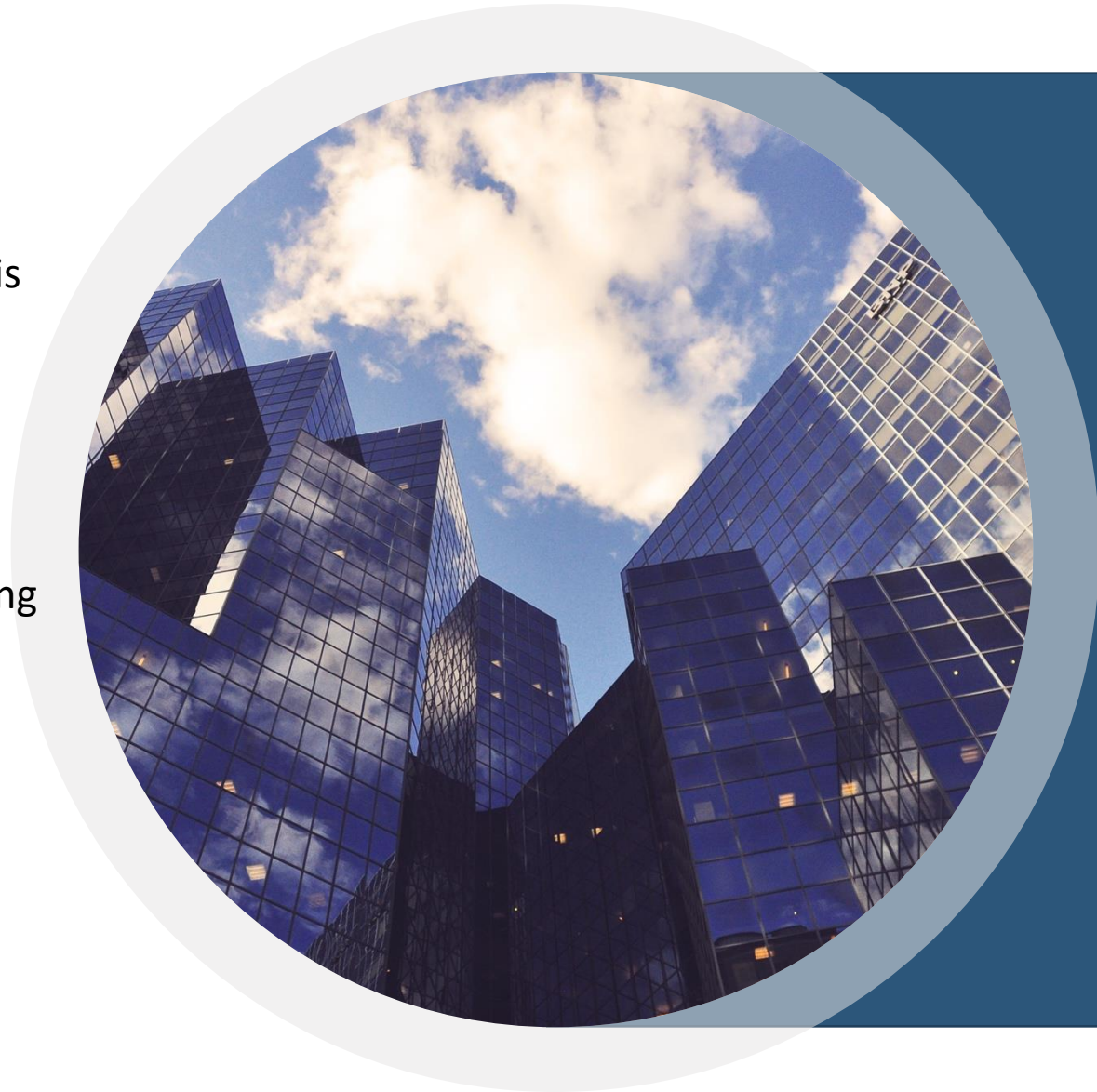
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11	Roosevelt Island	Bus Stop	Bus Line	General Travel	Bus Station

RESULTS



DISCUSSION

- This analysis is performed on limited data. This may be right or may be wrong. But if good amount of data is available there is scope to come up with better results.
- Upper East Side, Yorkville and Lenox Hill have also potential good bus stop location
- It can be done more detailed analysis by adding other factors such as transportation, demographics of inhabitants.





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