

Introduction/Business Problem

In this project we are going to finding a good location in New York for my relocation and this report targets all the families planning to relocate the New York.

Since there are lots of communities in New York we will **find a good community in the neighborhood** and at the same time with **good school ratings**. We would also prefer **locations as close to city as possible**, assuming that first two conditions are met.

We will use our data science powers to generate a few most promising neighborhoods based on these criteria. Advantages of each area will then be clearly expressed so that best possible final location can be chosen by stakeholders.

Based on the definition of our problem factors that will influence our decision are:

- number of existing schools available in the neighborhood
- distance to schools in the neighborhood, if any
- distance of neighborhood from the city

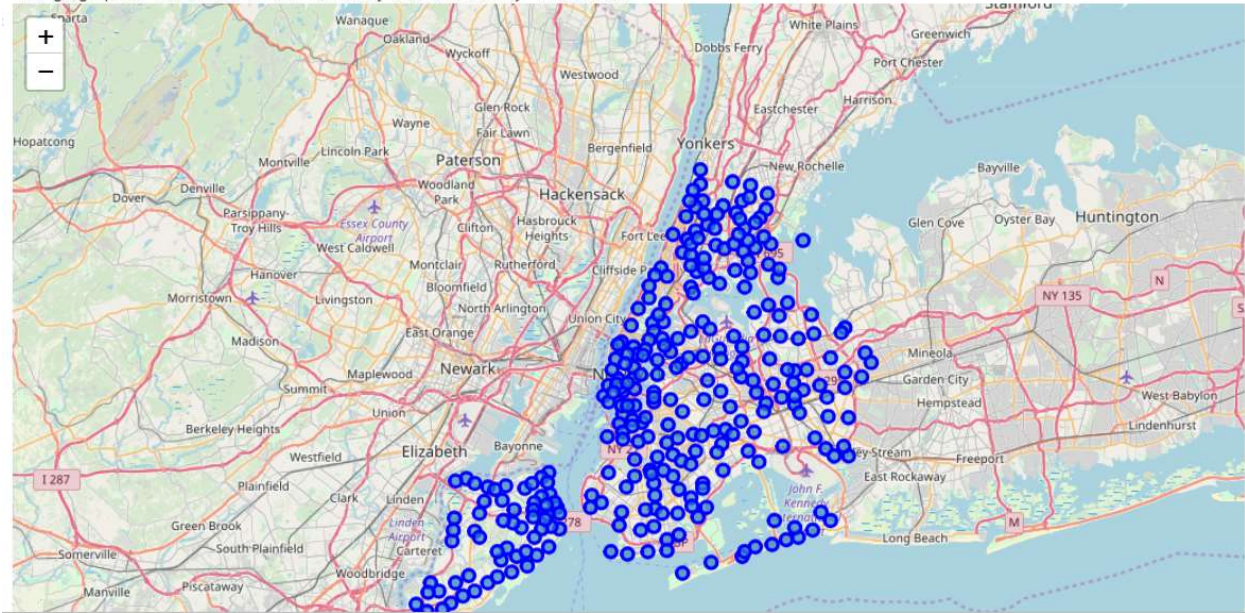
Following data sources will be needed to extract/generate the required information:

- New York Neighborhood data will be gathered from the below website in a Json format: https://geo.nyu.edu/catalog/nyu_2451_34572
- **Foursquare API** will be used to explore schools near each New York neighborhood. This data needs to analyzed and find the frequency of schools available in each Neighborhood: <https://api.foursquare.com/v2/venues/explore?>
- Geopy library to get the latitude and longitude values of New York City Folium visualization library to display the data in the map, each circle mark to reveal the name of the neighborhood and its respective borough, for illustration purposes, simplified the map and segment and cluster only the neighborhoods. Machine learnings: K-means Clustering algorithm is used in this project. The data are clustered based on the similarity. There are 5 cluster used in this project to cluster the data.

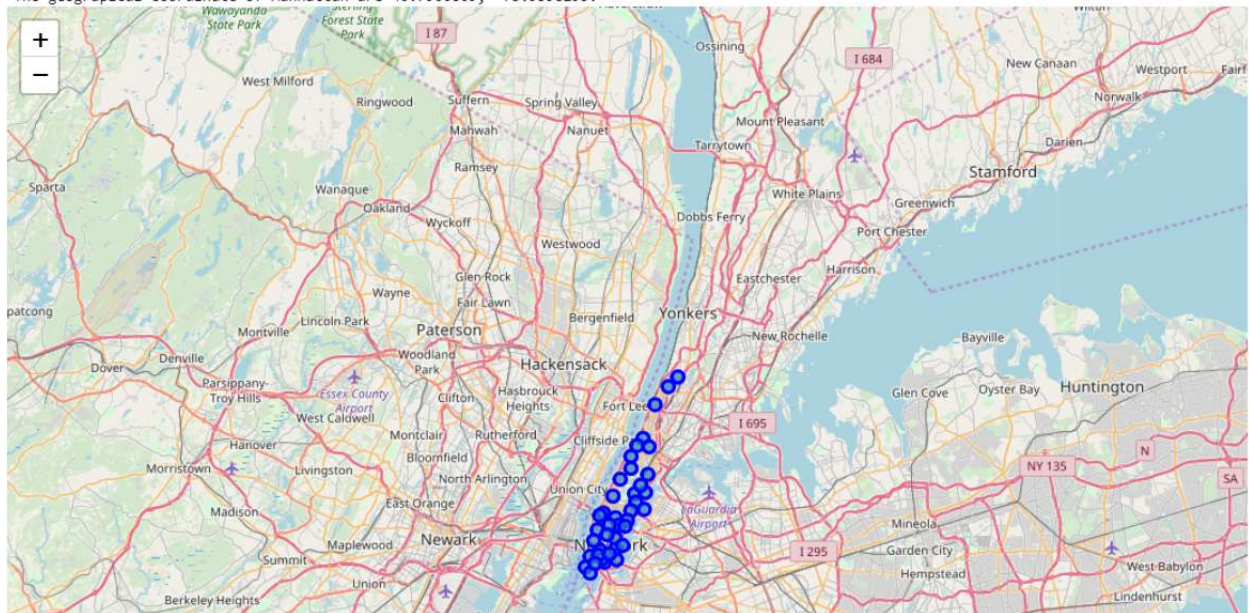
Sample Neighbors:

	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

The geographical coordinate of New York City are 40.7308619, -73.9871558.



The geographical coordinate of Manhattan are 40.7900869, -73.9598295.



Nearby venues:

	name	categories	lat	lng
0	The New Visions Charter High School for the Hu...	School	40.877392	-73.912769
1	P.S 207	School	40.878314	-73.905977
2	John F. Kennedy High School	High School	40.876944	-73.912976
3	Bronx Theatre High School	High School	40.875952	-73.912384
4	marble hill high school	High School	40.877414	-73.912597
5	John F. Kennedy High School	High School	40.877266	-73.912746
6	Korean School Of New York	Language School	40.878851	-73.912671
7	Public school 207	School	40.878345	-73.906568
8	ELLIS Preparatory Academy	High School	40.875809	-73.912597
9	International Leadership Charter School	High School	40.880955	-73.909562
10	IN-Tech Academy MS/HS 368	High School	40.878978	-73.910518
11	IN-Tech Academy	High School	40.879030	-73.911061
12	In Tech Academy	High School	40.879229	-73.910093
13	Atmosphere Academy	Middle School	40.874669	-73.909933
14	PS/MS 37	Elementary School	40.880132	-73.910600
15	PS 186X Site 306	Elementary School	40.873867	-73.907091
16	Hispanoamericana Adult Education Center	Adult Education Center	40.875239	-73.909315

Manhattan Venues:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.91066	The New Visions Charter High School for the Hu...	40.877392	-73.912769	School
1	Marble Hill	40.876551	-73.91066	P.S 207	40.878314	-73.905977	School
2	Marble Hill	40.876551	-73.91066	John F. Kennedy High School	40.876944	-73.912976	High School
3	Marble Hill	40.876551	-73.91066	Bronx Theatre High School	40.875952	-73.912384	High School
4	Marble Hill	40.876551	-73.91066	marble hill high school	40.877414	-73.912597	High School

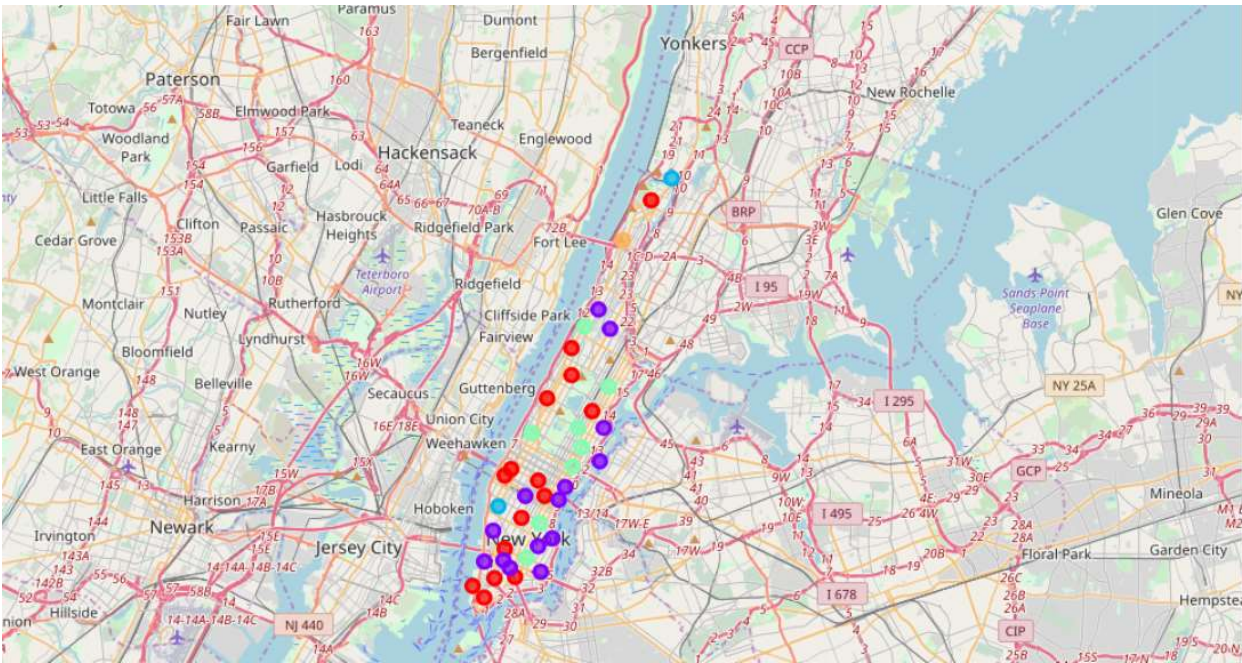
Venues by frequency:

----Battery Park City----		
	venue	freq
0	School	0.4
1	Nursery School	0.1
2	College Academic Building	0.1
3	Music School	0.1
4	College Library	0.1
----Carnegie Hill----		
	venue	freq
0	School	0.35
1	High School	0.12
2	Music School	0.12
3	Language School	0.09
4	Elementary School	0.09

Top 5 Neighborhood venues:

	Neighborhood	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	9th Most Common Venue	10th Most Common Venue
0	Battery Park City	School	Cooking School	College Library	Nursery School	College Academic Building	Preschool	Music School	College Residence Hall	College Auditorium	College Science Building
1	Carnegie Hill	School	Music School	High School	Language School	Elementary School	Driving School	Preschool	Middle School	Church	College Academic Building
2	Central Harlem	School	Elementary School	Middle School	College Academic Building	Church	Driving School	Arts & Crafts Store	Building	Dance Studio	Cooking School
3	Chelsea	High School	School	Elementary School	Swim School	Office	College Lab	Preschool	College Classroom	College Engineering Building	College Gym
4	Chinatown	School	High School	Music School	Driving School	Middle School	Elementary School	College Arts Building	College Classroom	Preschool	Church

Map by cluster:



Sample final data:

	Neighborhood	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	9th Most Common Venue	10th Most Common Venue
1	Chinatown	School	High School	Music School	Driving School	Middle School	Elementary School	College Arts Building	College Classroom	Preschool	Church
3	Inwood	School	Driving School	College Academic Building	High School	Adult Education Center	Office	College Auditorium	Community College	Cooking School	College Theater
12	Upper West Side	School	Music School	High School	Elementary School	Preschool	Church	Nursery School	Middle School	Dance Studio	Office
14	Clinton	School	Music School	Church	General College & University	High School	Middle School	Office	Playground	Elementary School	Adult Education Center
15	Midtown	School	Language School	Trade School	High School	Office	General College & University	Adult Education Center	Music School	Preschool	College Academic Building
16	Murray Hill	School	Language School	High School	Music School	Nursery School	Preschool	Daycare	Driving School	Office	Trade School
18	Greenwich Village	School	High School	Language School	Adult Education Center	College Academic Building	Nursery School	Law School	Office	General College & University	Music School
25	Manhattan Valley	School	Preschool	Elementary School	High School	College Academic Building	Nursery School	Church	Pool	Music School	Swim School

Results and Discussions

From our analysis we see about the result of schools to be the best in the neighborhood and the recommended zones should therefore be considered only as a starting point for more detailed analysis which could eventually result in location which has not only no nearby competition but also other factors taken into account and all other relevant conditions met.

Conclusion

Purpose of this project was to identify best communities with good schools in New York and zone centers were created to be used as starting points for final exploration by stakeholders.

Final decision on the location will be made by stakeholders based on specific characteristics of neighborhoods and locations in every recommended zone, taking into consideration additional factors like attractiveness of each location (proximity to park or water), levels of noise / proximity to major roads etc.

In [] :