

Capstone Project - Battle of the Neighborhoods

1. Introduction: Business Problem - Opening a Japanese Restaurant

New York City's demographics show that it is a large and ethnically diverse metropolis. With its diverse culture, comes diverse food items. There are many restaurants in New York City, each belonging to different categories like Chinese, Spanish, French etc.

If you're a stakeholder, entrepreneur, or chef interested in opening a Japanese restaurant in New York city, this will be for you.

Using efficient data science tools, we will suggest the promising locations to solve the below problems of finding out

- Which areas in New York City have Japanese restaurants?
- Which all areas lack Japanese Restaurants?
- Which is the best location for Japanese restaurants in New York City?

2. Data Description

For this project we need the following data:

(1) New York City data that contains list Boroughs, Neighborhoods along with their latitude and longitude.

- ✧ Data source : https://cocl.us/new_york_dataset
- ✧ Description : This data set contains the required information. And we will use this data set to explore various neighborhoods of New York City.

(2) Japanese restaurants in each neighborhood of New York City.

- ✧ Data source : Foursquare API
- ✧ Description : By using this API, we will get all the venues in each neighborhood. We can filter these venues to get only Japanese restaurants.

(3) GeoSpace data

- ✧ Data source : <https://data.cityofnewyork.us/City-Government/Borough-Boundaries/tqmj-j8zm>
- ✧ Description : By using this geo space data we will get the New York Borough boundaries that will help us visualize choropleth map.

3. Methodology

(1) Collect the New York City data from https://cocl.us/new_york_dataset.

(2) Find all venues for each neighborhood using FourSquare API.

```
In [10]: new_york_data=get_new_york_data()  
new_york_data.head()
```

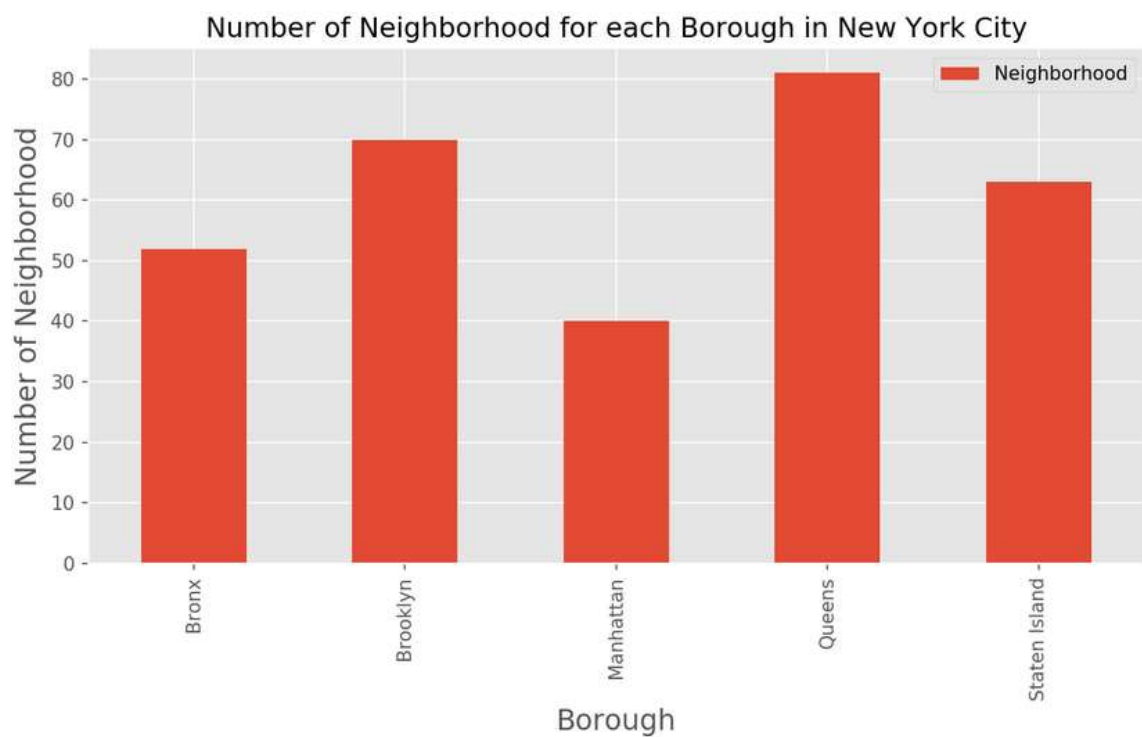
Out [10]:

	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

```
In [11]: new_york_data.shape
```

Out [11]: (306, 4)

there are 306 different Neighborhoods in New York



(3) Filter out all venues that are Japanese Restaurants for further analysis.

```
( 1 / 306 ) Japanese Resturants in Wakefield, Bronx:0
( 2 / 306 ) Japanese Resturants in Co-op City, Bronx:0
( 3 / 306 ) Japanese Resturants in Eastchester, Bronx:0
( 4 / 306 ) Japanese Resturants in Fieldston, Bronx:0
( 5 / 306 ) Japanese Resturants in Riverdale, Bronx:2
( 6 / 306 ) Japanese Resturants in Kingsbridge, Bronx:2
( 7 / 306 ) Japanese Resturants in Marble Hill, Manhattan:0
( 8 / 306 ) Japanese Resturants in Woodlawn, Bronx:0
( 9 / 306 ) Japanese Resturants in Norwood, Bronx:0
( 10 / 306 ) Japanese Resturants in Williamsbridge, Bronx:0
( 11 / 306 ) Japanese Resturants in Baychester, Bronx:0
( 12 / 306 ) Japanese Resturants in Pelham Parkway, Bronx:0
( 13 / 306 ) Japanese Resturants in City Island, Bronx:1
( 14 / 306 ) Japanese Resturants in Bedford Park, Bronx:0
( 15 / 306 ) Japanese Resturants in University Heights, Bronx:0
```

```
In [16]: Japanese_rest_ny.head()
```

Out[16]:

	Borough	Neighborhood	ID	Name
0	Bronx	Riverdale	503cfafe4b066d39de5005a	Aoyu Japanese Restaurant
1	Bronx	Riverdale	4b0b311af964a520642e23e3	Palace of Japan
2	Bronx	Kingsbridge	503cfafe4b066d39de5005a	Aoyu Japanese Restaurant
3	Bronx	Kingsbridge	4b0b311af964a520642e23e3	Palace of Japan
4	Bronx	City Island	4dbdf3d790a02849cbd675be	Ohana Japanese Habachi Seafood & Steakhouse

```
In [17]: Japanese_rest_ny.shape
```

Out[17]: (208, 4)

Got 208 Japanese restaurants across New York City

(4) Find the Ratings, Tips and number of Likes for all the Japanese Restaurants using FourSquare API.

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Riverdale	503cfafe4b066d39de5005a	Aoyu Japanese Restaurant	32	9.2	19
1	Bronx	Riverdale	4b0b311af964a520642e23e3	Palace of Japan	38	8.5	26
2	Bronx	Kingsbridge	503cfafe4b066d39de5005a	Aoyu Japanese Restaurant	32	9.2	19
3	Bronx	Kingsbridge	4b0b311af964a520642e23e3	Palace of Japan	38	8.5	26
4	Bronx	City Island	4dbdf3d790a02849cbd675be	Ohana Japanese Habachi Seafood & Steakhouse	34	7.5	18

(5) Sort neighborhoods and borough the data keeping ratings as the constraint.

	Neighborhood	Average Rating
103	Stuyvesant Town	9.200000
80	Midtown South	9.150000
38	Flatiron	9.133333
33	East Village	9.133333
101	South Side	9.100000
24	Cobble Hill	9.100000
68	Little Italy	9.100000
19	Chinatown	9.100000
84	Noho	9.050000
85	North Side	9.050000

	Borough	Average Rating
2	Manhattan	8.720690
1	Brooklyn	7.662319
0	Bronx	7.590000
3	Queens	6.990741
4	Staten Island	5.852941

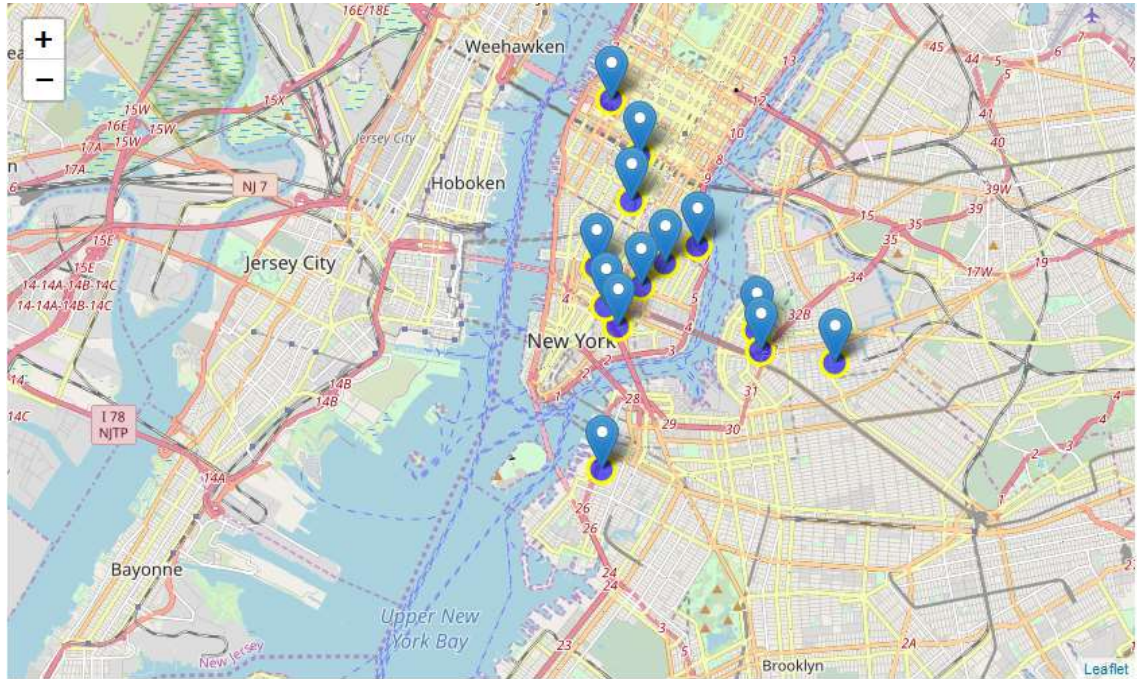
(6) Consider all the neighborhoods with average rating greater or equal to visualize on map

	Neighborhood	Average Rating
103	Stuyvesant Town	9.200000
80	Midtown South	9.150000
33	East Village	9.133333
38	Flatiron	9.133333
19	Chinatown	9.100000
24	Cobble Hill	9.100000
68	Little Italy	9.100000
101	South Side	9.100000
84	Noho	9.050000
85	North Side	9.050000
22	Clinton	9.000000
34	East Williamsburg	9.000000
53	Greenwich Village	9.000000

(7) Join this dataset to original New York data to get longitude and latitude.

	Borough	Neighborhood	Latitude	Longitude	Average Rating
12	Manhattan	Stuyvesant Town	40.731000	-73.974052	9.200000
8	Manhattan	Midtown South	40.748510	-73.988713	9.150000
3	Manhattan	East Village	40.727847	-73.982226	9.133333
5	Manhattan	Flatiron	40.739673	-73.990947	9.133333
0	Manhattan	Chinatown	40.715618	-73.994279	9.100000
2	Brooklyn	Cobble Hill	40.687920	-73.998561	9.100000
7	Manhattan	Little Italy	40.719324	-73.997305	9.100000
11	Brooklyn	South Side	40.710861	-73.958001	9.100000
9	Manhattan	Noho	40.723259	-73.988434	9.050000
10	Brooklyn	North Side	40.714823	-73.958809	9.050000
1	Manhattan	Clinton	40.759101	-73.996119	9.000000
4	Brooklyn	East Williamsburg	40.708492	-73.938858	9.000000
6	Manhattan	Greenwich Village	40.726933	-73.999914	9.000000

(8) Visualize the neighborhoods based on average rating by using python's Folium library.
Neighborhoods based on average rating:



4. Results & Discussion

- There are total of 306 different Neighborhoods in New York
- We have 208 Japanese Restaurants across New York City
- Stuyvesant has the highest average rating = 9.2 for Japanese Restaurants among all neighborhoods
- Top 3 Boroughs with top average ranking of Japanese Restaurants are: Manhattan (8.72), Brooklyn (7.66) and Bronx (7.59)
- The recommendation location to open Japanese Restaurant is Stuyvesant Town based on the best-rated Japanese Restaurant in New York.

5. Conclusion

According to the above results and discussion, these are all neighborhoods option to open the first Japanese Restaurant.

Neighborhood	Average Rating
Stuyvesant Town	9.200000
Midtown South	9.150000
East Village	9.133333
Flatiron	9.133333
Chinatown	9.100000
Cobble Hill	9.100000
Little Italy	9.100000
South Side	9.100000
Noho	9.050000
North Side	9.050000
Clinton	9.000000
East Williamsburg	9.000000
Greenwich Village	9.000000