FINAL REPORT

THE BATTLE OF NEIGHBORHOODS¶

Introduction:

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

So as part of this project , we will list and visualize all major parts of New York City that has great indian resturants.

Problem Description / Business Problem

A restaurant is a business which prepares and serves food and drink to customers in return for money, either paid before the meal, after the meal, or with an open account. The City of New York is famous for its excelllent cuisine. It's food culture includes an array of international cuisines influenced by the city's immigrant history.

Central and Eastern European immigrants, especially Jewish immigrants - bagels, cheesecake, hot dogs, knishes, and delicatessens Italian immigrants - New York-style pizza and Italian cuisine Jewish immigrants and Irish immigrants - pastrami and corned beef Chinese and other Asian restaurants, sandwich joints, trattorias, diners, and coffeehouses are ubiquitous throughout the city mobile food vendors - Some 4,000 licensed by the city Middle Eastern foods such as falafel and kebabs examples of modern New York street food It is famous for not just Pizzerias, Cafe's but also for fine dining Michelin starred restaurants.The city is home to "nearly one thousand of the finest and most diverse haute cuisine restaurants in the world", according to Michelin. So it is evident that to survive in such competitive market it is very important to startegically plan. Various factors need to be studied inorder to decide on the Location such as :

New York Population New York City Demographics Are there any Farmers Markets, Wholesale markets etc nearby so that the ingredients can be purchased fresh to maintain quality and cost? Are there any venues like Gyms, Entertainmnet zones, Parks etc nearby where floating population is high etc Who are the competitors in that location? Cuisine served / Menu of the competitors Segmentation of the Borough Untapped markets Saturated markets etc The list can go on... Eventhough well funded we need to choose the correct location to start its first venture.If this is successful they can replicate the same in other locations. First move is very important, thereby choice of location is very important.

Data Section:

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, Indian, and French etc.

For this project we need the following data:

- New York City data that contains list Boroughs, Neighbourhoods 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 neighbourhoods of New York City

- Indian restaurants in each neighbourhood of New York City.
  - Data source : Foursquare API
  - Description: By using this API we will get all the venues in each neighbourhood. We can filter these venues to get only Indian restaurants.

- 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.

Methodology:

1. We begin by collecting the New York city data from the following link "https://cocl.us/new_york_dataset"
2. We will find all venues for each neighbourhood using Foursquare API

```
In [6]: new_york_data=get_new_york_data()

In [7]: new_york_data.head()
```

Out[7]:
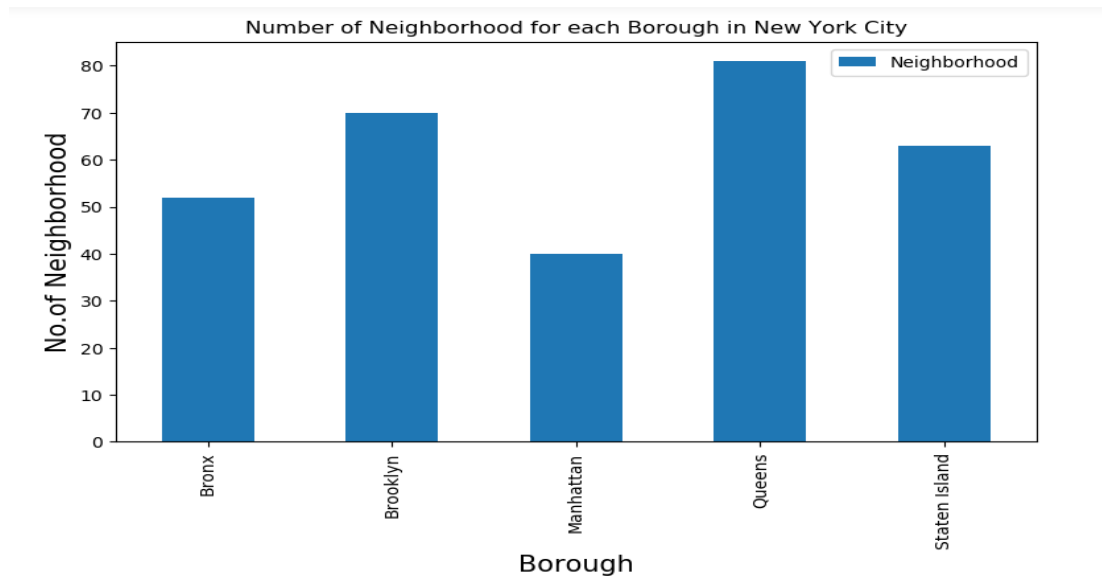
	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

```
In [8]: new_york_data.shape
```
Out[8]: (306, 4)

The above result shows that there are 306 different Neighborhoods in New York.

Number of Neighborhood for each Borough in New York City

3. We will then filter out all venues with Indian restaurant for further analysis.

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

4. Next using Foursquare API, we will find the Ratings, Tips, and Number of Likes for all the Indian Restaurants.

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot	5	7.6	10
1	Bronx	Parkchester	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3	5.8	2
2	Bronx	Spuyten Duyvil	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.1	9
3	Bronx	Concourse	551b7f75498e86c00a0ed2e1	Hungry Bird	8	6.9	3
4	Bronx	Unionport	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3	5.8	2

5. We will then sort Neighbourhoods and Borough the data keeping Ratings as the constraint.

	Neighborhood	Average Rating
12	Civic Center	9.100000
69	Tribeca	9.100000
0	Astoria	9.000000
5	Blissville	9.000000
75	West Village	8.800000
44	Midtown South	8.800000
43	Midtown	8.800000
29	Gramercy	8.733333
25	Fort Greene	8.700000
11	Chelsea	8.700000

	Borough	Average Rating
2	Manhattan	8.210000
1	Brooklyn	7.700000
3	Queens	6.552113
0	Bronx	5.585714
4	Staten Island	3.533333

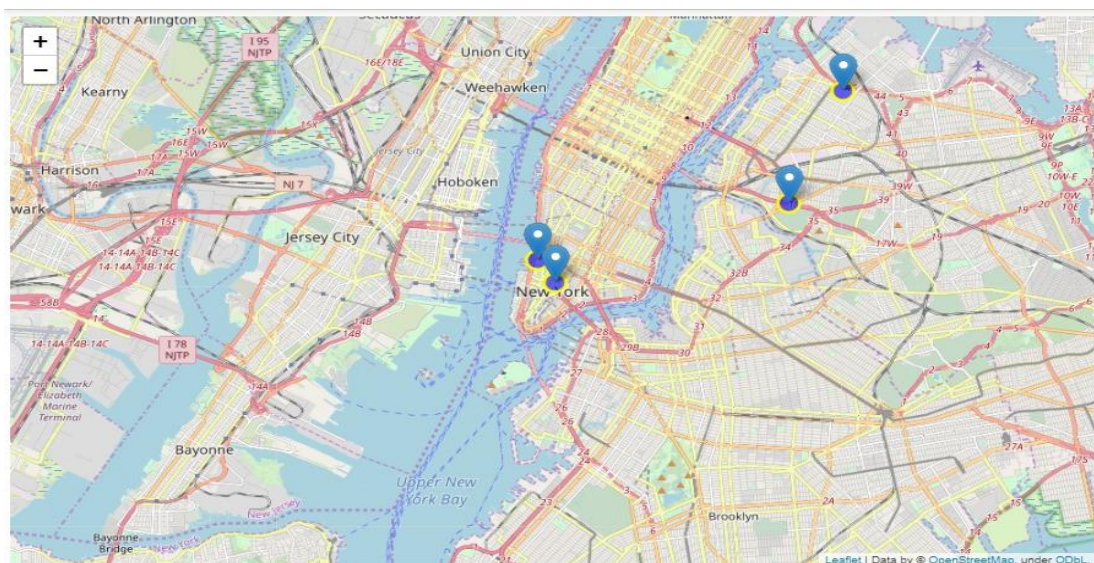6. Next we will consider all the neighbourhoods with average rating greater or equal 9.0 to visualize on map.

	Neighborhood	Average Rating
0	Astoria	9.0
5	Blissville	9.0
12	Civic Center	9.1
69	Tribeca	9.1

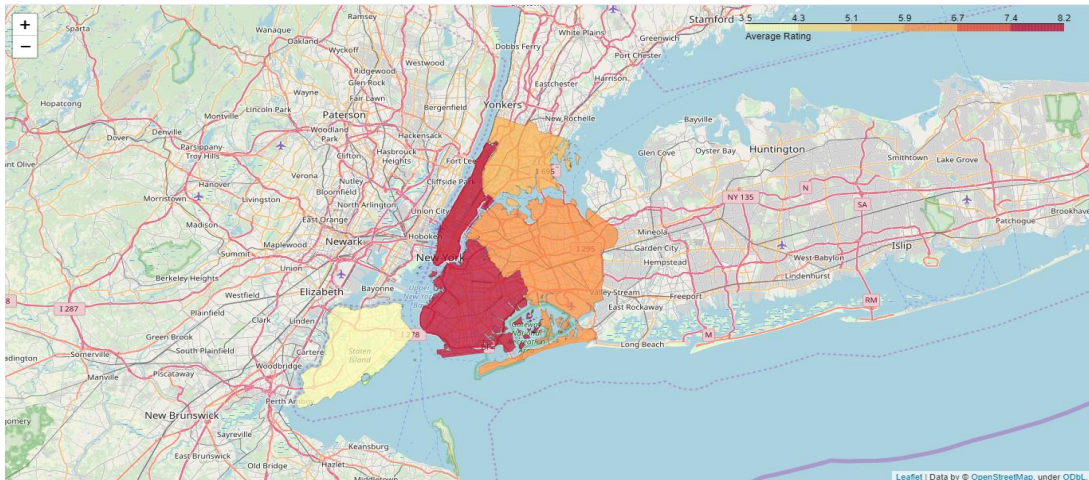7. We will join this dataset to original New York data to get longitude and latitude.

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Queens	Astoria	40.768509	-73.915654	9.0
1	Queens	Blissville	40.737251	-73.932442	9.0
2	Manhattan	Civic Center	40.715229	-74.005415	9.1
3	Manhattan	Tribeca	40.721522	-74.010683	9.1

8. Finally, we will visualize the Neighbourhoods and Borough based on average Rating using python's Folium library.

Neighbourhoods based on average rating:

Borough based on average rating:

Result:

So now we can answer the questions asked above in the Questions section:

Answers:

1. The following location in New York City has great Indian restaurants.

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Queens	Astoria	40.768509	-73.915654	9.0
1	Queens	Blissville	40.737251	-73.932442	9.0
2	Manhattan	Civic Center	40.715229	-74.005415	9.1
3	Manhattan	Tribeca	40.721522	-74.010683	9.1

2. Astoria (Queens), Blissville (Queens), Civic Center (Manhattan) are some of the best neighbourhoods for Indian cuisine.
3. Manhattan have potential Indian Restaurant Market.
4. Staten Island ranks last in average rating of Indian Restaurants.
5. Manhattan is the best place to stay if you prefer Indian Cuisine.

Conclusion:

There is always room for improvement and hence the above solution I have provided can also be improved for best results depending upon the data we have.