

Capstone Project - The Battle of Neighborhoods

Introduction (Part1)

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1 Introduction

New York, nowadays, is home of nearly 9 million people, accounting over the 40% of the population of New York State and slightly lower to the New York metropolitan area, home of over 23 million people. In the last years the city has been growing faster than any other city of the state and leads the metropolitan gateway for legal immigrants admitted into the United States.

In New York's demographics it is shown that it is an enormous diversity in its food, due to the so many cultures that are settled in there. As a result of this diversity there are a many restaurant in New York based on the culture of their owner like Chinese, Taiwanese, Italian etc.

2 Problem

To find the answers to the following questions:

1. List and visualize all major parts of New York City that has great Indian restaurants.
2. What is the best location in New York for Indian food?
3. Which areas have potential Indian restaurants market?
4. Which all areas lack Indian restaurants.
5. Which is the best place to stay if you prefer Indian food?

3 Data Section

In New York's demographics it is shown that it is an enormous diversity in its food, due to the so many cultures that are settled in there. As a result of this diversity there are a many restaurant in New York based on the culture of their owner like Chinese, Taiwanese, Italian etc.

In order to develop this project, the following data is needed:

- Data that contains list Boroughs, Neighborhoods, from New York, and their respective location (longitude and latitude).
 - Source: https://cocl.us/new_york_dataset
 - Description: This dataset contains the requires information in a .json file that will be used to explore the neighborhoods of New York.
- Indian restaurants in each neighborhood of New York
 - Source: Foursquare API

- Description: With the help of Foursquare API we will be able to get the names of the venues of each neighborhood and the ones that have Indian restaurants, done by filtering.
- Geo Space data
 - Source: <https://data.cityofnewyork.us/City-Government/Borough-Boundaries/tqmj-j8zm>
 - Description: With the help of this Geo Space data we will be able to get information of New York Borough boundaries in order to create a choropleth map.

4 Methodology

1. Data is downloaded using the given link in the Data Section.
2. We will find all venues for each neighborhood with the help of Foursquare API.

```
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

Figure 1. New York Location data.

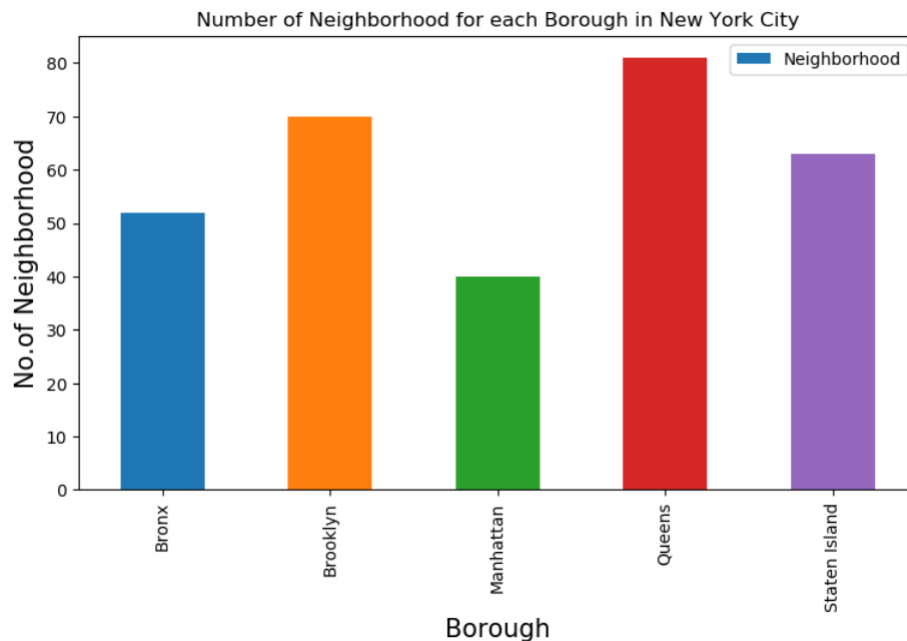


Figure 2. Plot neighborhoods of New York City.

3. The venues with Indian restaurants on it are filtered for further analysis.

```
( 124 / 306 ) Indian Resturants in West Village, Manhattan:1
( 125 / 306 ) Indian Resturants in Manhattan Valley, Manhattan:2
( 126 / 306 ) Indian Resturants in Morningside Heights, Manhattan:1
( 127 / 306 ) Indian Resturants in Gramercy, Manhattan:6
( 128 / 306 ) Indian Resturants in Battery Park City, Manhattan:0
( 129 / 306 ) Indian Resturants in Financial District, Manhattan:0
( 130 / 306 ) Indian Resturants in Astoria, Queens:1
( 131 / 306 ) Indian Resturants in Woodside, Queens:8
( 132 / 306 ) Indian Resturants in Jackson Heights, Queens:5
( 133 / 306 ) Indian Resturants in Elmhurst, Queens:3
( 134 / 306 ) Indian Resturants in Howard Beach, Queens:0
( 135 / 306 ) Indian Resturants in Corona, Queens:0
( 136 / 306 ) Indian Resturants in Forest Hills, Queens:0
( 137 / 306 ) Indian Resturants in Kew Gardens, Queens:2
( 138 / 306 ) Indian Resturants in Richmond Hill, Queens:6
( 139 / 306 ) Indian Resturants in Flushing, Queens:0
( 140 / 306 ) Indian Resturants in Long Island City, Queens:3
( 141 / 306 ) Indian Resturants in Sunnyside, Queens:1
( 142 / 306 ) Indian Resturants in East Elmhurst, Queens:0
( 143 / 306 ) Indian Resturants in Maspeth, Queens:0
```

Figure 3. Ranking of each restaurant.

- Find the ratings, likes, and tips of all the Indian restaurants using Foursquare API.

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot	5	7.8	10
1	Bronx	Norwood	0		0	0.0	0
2	Bronx	Parkchester	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3	6.0	2
3	Bronx	Spuyten Duyvil	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.0	9
4	Bronx	Concourse	551b7f75498e86c00a0ed2e1	Hungry Bird	8	6.8	3

Figure 4. Indian Restaurants with their respective ratings, tips and likes.

- Filter neighborhoods and ratings from the original dataset.

	Neighborhood	Average Rating
25	Fort Greene	8.8
14	Clinton Hill	8.8
52	Prospect Heights	8.7
70	Tribeca	8.6
31	Greenwich Village	8.6
75	West Village	8.6
61	Roosevelt Island	8.5
63	South Side	8.4
18	East Flatbush	8.3
78	Yorkville	8.2

Figure 5. Average Rating of each neighborhood.

	Borough	Average Rating
2	Manhattan	6.261290
1	Brooklyn	5.940000
0	Bronx	4.657143
3	Queens	0.000000
4	Staten Island	0.000000

Figure 6. Average Rating of each borough.

6. Get all the neighborhoods with eight or greater average to visualize them on the map.

	Neighborhood	Average Rating
11	Central Harlem	8.0
14	Clinton Hill	8.8
18	East Flatbush	8.3
25	Fort Greene	8.8
31	Greenwich Village	8.6
49	Ocean Hill	8.0
52	Prospect Heights	8.7
61	Roosevelt Island	8.5
63	South Side	8.4
70	Tribeca	8.6
74	Washington Heights	8.0
75	West Village	8.6
78	Yorkville	8.2

Figure 7. Filtering neighborhoods based on their rating.

7. Join this dataset to the dataset of New York's data in order to get the latitude and longitude of the neighborhoods.

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Manhattan	Central Harlem	40.815976	-73.943211	8.0
1	Brooklyn	Clinton Hill	40.693229	-73.967843	8.8
2	Brooklyn	East Flatbush	40.641718	-73.936103	8.3
3	Brooklyn	Fort Greene	40.688527	-73.972906	8.8
4	Manhattan	Greenwich Village	40.726933	-73.999914	8.6
5	Brooklyn	Ocean Hill	40.678403	-73.913068	8.0
6	Brooklyn	Prospect Heights	40.676822	-73.964859	8.7
7	Manhattan	Roosevelt Island	40.762160	-73.949168	8.5
8	Brooklyn	South Side	40.710861	-73.958001	8.4
9	Manhattan	Tribeca	40.721522	-74.010683	8.6
10	Manhattan	Washington Heights	40.851903	-73.936900	8.0
11	Manhattan	West Village	40.734434	-74.006180	8.6
12	Manhattan	Yorkville	40.775930	-73.947118	8.2

Figure 8. Joining the ratings and locations dataset.

8. Make a visualization(map) of the neighborhoods with the ratings filtered and placed on the map, using Folium's library from python.

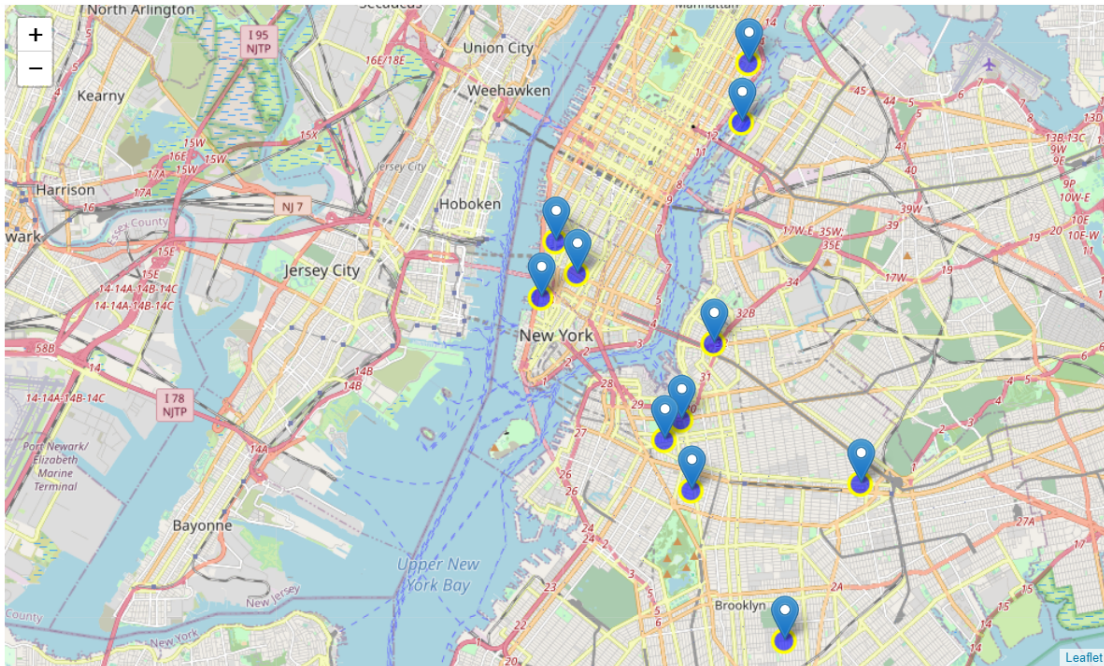


Figure 9. Markers on map.

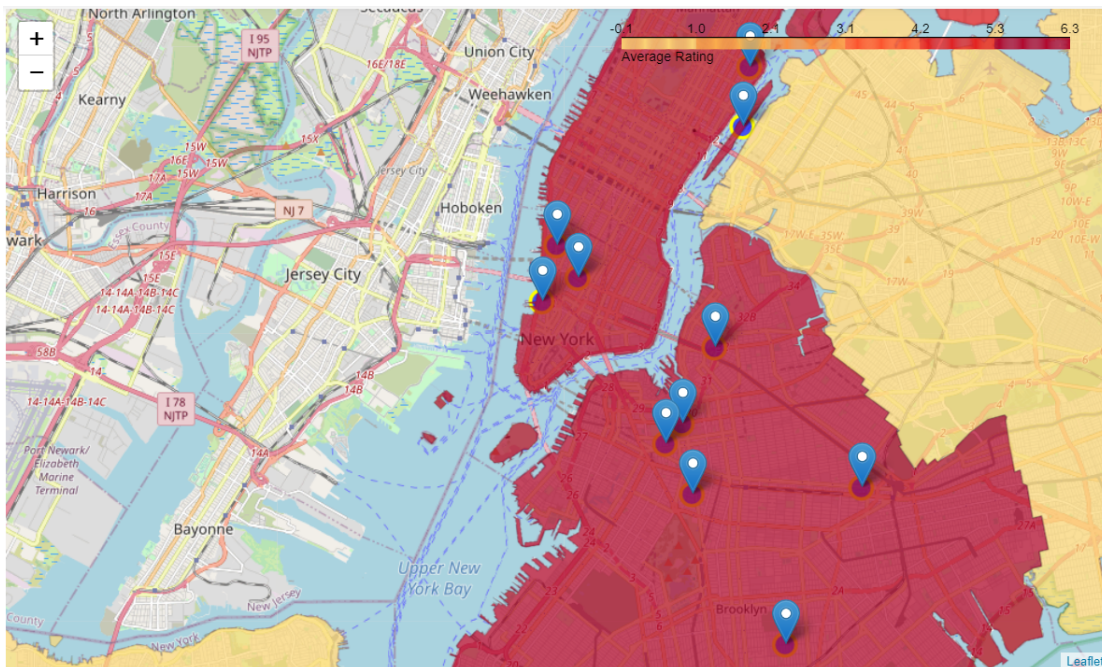


Figure 10. Choropleth map.

5 Results

By applying all the data preprocessing and visualization we were able to answer to the questions in the problem section.

1. The location of the best rated Indian restaurants in New York city.

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Manhattan	Central Harlem	40.815976	-73.943211	8.0
1	Brooklyn	Clinton Hill	40.693229	-73.967843	8.8
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Figure 11. Joining the ratings and locations dataset.

2. The best neighborhoods in NewYork for Indian food are Astoria (Queens), Blissville (Queens), Civic Center (Manhattan).
3. Manhattan has potential Indian Restaurant Market.
4. Staten Island ranks last in average rating of Indian Restaurants.
4. Manhattan is the best place to stay if you prefer Indian Cuisine.

6 Conclusion

It was possible to use Foursquare API and make data manipulation with pandas in order to visualize in a map, using Foulum, the best Indian restaurants in new York city.