

FINAL REPORT

Capstone Project - The Battle of Neighbourhoods

Introduction/Business Problem section:

The demographics of New York City indicate that it is a metropolis that is broad and ethnically diverse. It is the largest city with a long history of international immigration in the United States. In 2014, New York City was home to about 8.5 million residents, accounting for about 40 percent of the population of the state of New York and a significantly smaller proportion of the metropolitan area of New York, home to around 23.6 million.

The city has been rising faster than the area over the last decade. The New York area continues to be the leading metropolitan gateway for accepted legal immigrants to the United States by far. New York City has also been an important entry point for immigrants; the word "melting pot" was coined on the Lower East Side to describe heavily populated immigrant communities.

In New York, as many as 800 languages are spoken, making it the world's most linguistically diverse region. While there are areas in the outer boroughs in which up to 25 percent of people speak English as an alternative language and/or have little or no fluency in English, English remains the most spoken language. In communities such as Flushing, Sunset Park, and Corona, English is less spoken. With its diverse community, numerous food products are available. In New York City, there are several restaurants, each belonging to various categories, such as Chinese, Indian, and French, etc.

Target Audience:

A customer who is an immigrant in the New York city or a normal person who likes to explore different cuisine. Customer wants a good recommendation for the Indian restaurant which provide the best taste.

Success Criteria:

We should help to make the best choice for the below points by listing and visualizing all major parts of New York City that has great Indian restaurants.

- what is best location in New York City for Indian Cuisine?
- which areas have potential Indian Restaurant Market?
- which all areas lack Indian Restaurants?
- which is the best place to stay if you prefer Indian Cuisine?

Data Section:

The demographics of New York City indicate that it is a mega city that is broad and ethnically diverse. With its diverse community, numerous food products are available. In New York City, there are several restaurants, each belonging to various categories, such as Chinese, Indian, and French, etc.

For this project we will be working on the following data:

1. New York City dataset: https://cocl.us/new_york_dataset
 - a. The dataset contains list Boroughs, Neighbourhoods along with their latitude and longitude.
 - b. The necessary information is included in this data set and to explore different communities of New York City, we can use this dataset.
2. Foursquare API : <https://ru.foursquare.com/>
 - a. This service is used to collect Foursquare location data, to explore and get all the venues in each neighbourhood. We can filter these venues to get only Indian restaurants s in each neighbourhood of New York City.
3. GeoSpace data: <https://data.cityofnewyork.us/City-Government/BoroughBoundaries/tqmi-j8zm>
 - a. We can get the New York Borough boundaries by using this geo space data that will help us visualize the map of choropleth.

Methodology Section:

Business Understanding:

- Our main goal is to find Indian restaurants which provide the best taste.

Exploratory Data Analysis:

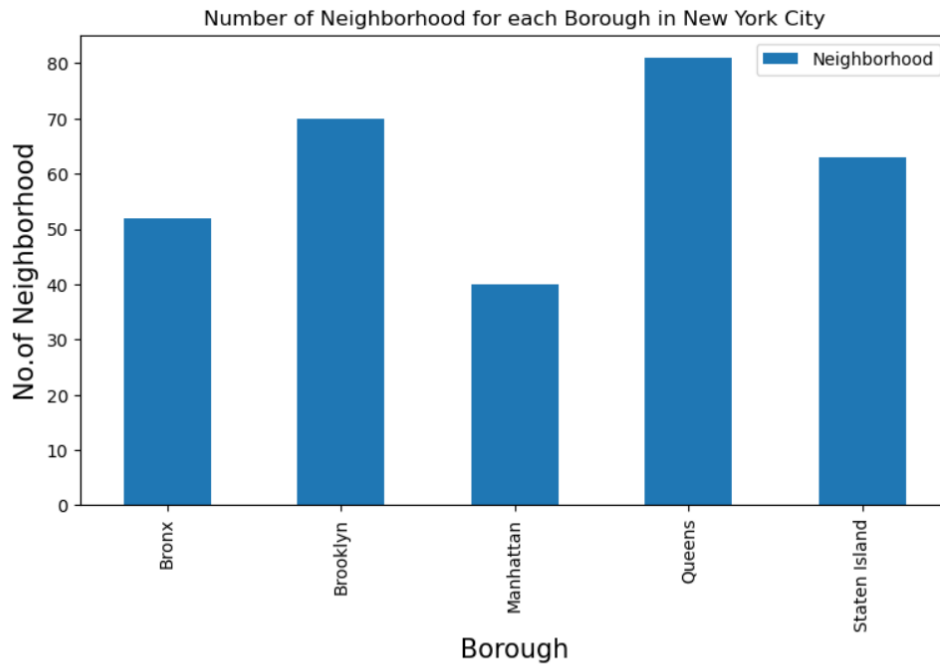
1. We begin by collecting the New York city data from the following link https://cocl.us/new_york_dataset

```
In [83]: new_york_data=get_new_york_data()  
         new_york_data.head()  
         new_york_data.shape
```

```
Out[83]: (306, 4)
```

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

2. We will find all venues for each neighbourhood using Foursquare API



From the above Bar Plot, we can see that Queens has highest number of neighborhoods.

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
( 16 / 306 ) Indian Resturants in Morris Heights, Bronx:0
( 17 / 306 ) Indian Resturants in Fordham, Bronx:0
( 18 / 306 ) Indian Resturants in East Tremont, Bronx:0
( 19 / 306 ) Indian Resturants in West Farms, Bronx:0
( 20 / 306 ) Indian Resturants in High Bridge, Bronx:0
( 21 / 306 ) Indian Resturants in Melrose, Bronx:0
( 22 / 306 ) Indian Resturants in Mott Haven, Bronx:0
( 23 / 306 ) Indian Resturants in Port Morris, Bronx:0
( 24 / 306 ) Indian Resturants in Longwood, Bronx:0
( 25 / 306 ) Indian Resturants in Hunts Point, Bronx:0
( 26 / 306 ) Indian Resturants in Morrisania, Bronx:0
( 27 / 306 ) Indian Resturants in Soundview, Bronx:0
( 28 / 306 ) Indian Resturants in Clason Point, Bronx:0
( 29 / 306 ) Indian Resturants in Throgs Neck, Bronx:0
( 30 / 306 ) Indian Resturants in Country Club, Bronx:0
( 31 / 306 ) Indian Resturants in Parkchester, Bronx:1
( 32 / 306 ) Indian Resturants in Westchester Square, Bronx:0
( 33 / 306 ) Indian Resturants in Van Nest, Bronx:0
( 34 / 306 ) Indian Resturants in Morris Park, Bronx:0
( 35 / 306 ) Indian Resturants in Belmont, Bronx:0
( 36 / 306 ) Indian Resturants in Spuyten Duyvil, Bronx:1
( 37 / 306 ) Indian Resturants in North Riverdale, Bronx:0
( 38 / 306 ) Indian Resturants in Pelham Bay, Bronx:0
( 39 / 306 ) Indian Resturants in Schuylerville, Bronx:0
( 40 / 306 ) Indian Resturants in Edgewater Park, Bronx:0
```

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

In [212]: `indian_rest_stats_ny.head()`

Out[212]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot	5.0	7.9	10.0
1	Bronx	Parkchester	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3.0	6.2	2.0
2	Bronx	Spuyten Duyvil	4c04544df423a593ac83d116	Cumin Indian Cuisine	13.0	5.8	9.0
3	Bronx	Concourse	551b7f75498e86c00a0ed2e1	Hungry Bird	8.0	7.2	3.0
4	Bronx	Unionport	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3.0	6.2	2.0

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

	Neighborhood	Average Rating
27	Tribeca	9.1
13	Greenwich Village	9.1
31	West Village	9.0
3	Chelsea	8.8
12	Gramercy	8.7
22	Prospect Lefferts Gardens	8.7
29	Upper West Side	8.6
9	Fort Greene	8.5
24	Roosevelt Island	8.4
25	South Side	8.3

Above are the top neighborhoods with top average rating of Indian restaurants.

	Borough	Average Rating
2	Manhattan	8.356
1	Brooklyn	7.755
0	Bronx	6.660

Above are the top Borough with the top average rating of Indian restaurants.

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

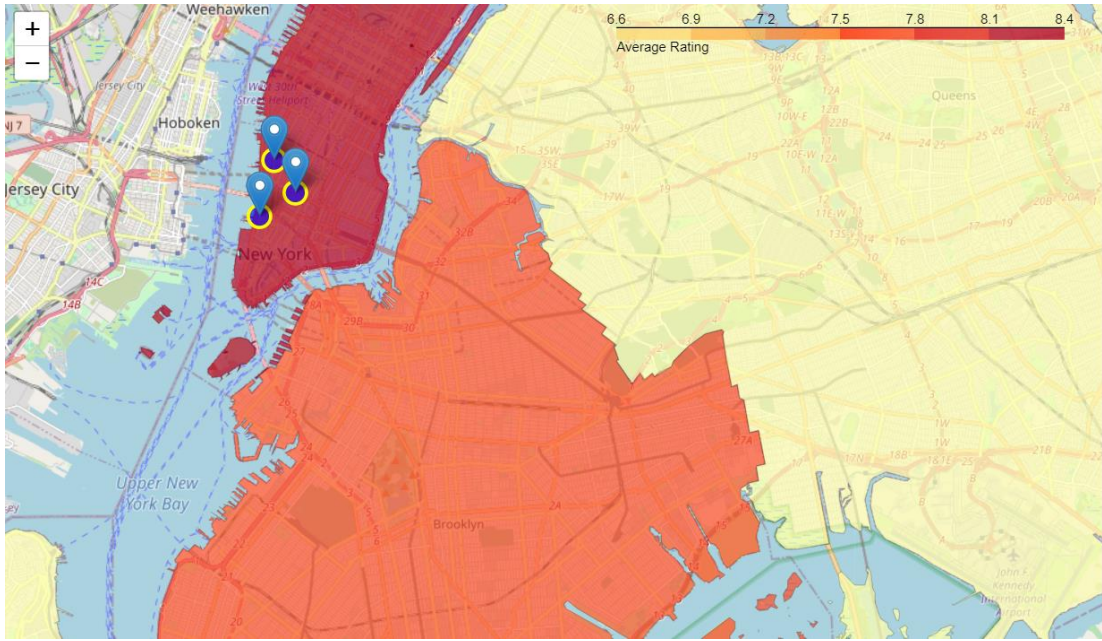
	Neighborhood	Average Rating
13	Greenwich Village	9.1
27	Tribeca	9.1
31	West Village	9.0

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

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Manhattan	Greenwich Village	40.726933	-73.999914	9.1
1	Manhattan	Tribeca	40.721522	-74.010683	9.1
2	Manhattan	West Village	40.734434	-74.006180	9.0

- 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 Section:

From our analysis main research results are:

- Greenwich Village (Manhattan), Tribeca (Manhattan), West Village (Manhattan) are some of the best neighborhoods for Indian cuisine.
- Manhattan have potential Indian Restaurant Market.
- Bronx ranks last in average rating of Indian Restaurants.
- Manhattan is the best place to stay if you prefer Indian Cuisine.

Conclusion section:

Our goal was to find the best Indian restaurants which provide the best taste.

As a result, we can recommend are Greenwich Village, Tribeca and West Village neighborhoods. In the future, it's a good idea to collect more information on wider area range instead of just New York city that will help to choose more places for the best Indian restaurants that provide the better Indian cuisine.