FINAL REPORT

The Capstone-The Battle of Neighborhoods

Introduction

New York City's demographics show that it is a large and ethnically diverse metropolis. It is the largest city in the United States with a long history of international immigration. New York City was home to over 8.3 million people in 2019, accounting for over 40% of the population of New York State and a slightly lower percentage of the New York metropolitan area, home to approximately 23.6 million. One of the **most** cosmopolitan **cities** in the world, **New York** is an exhilarating metropolis located on the East Coast of the US. Made up of five boroughs, Queens is the **most diverse**, with people from India, Korea, and Brazil to name but a few countries.

With the diversity of people city New York comes diversity in food. There are all types of cuisines from all over the world, from western countries to eastern countries. So in case you are going to New York For some work or vacation you might need some analysed data to help you find your favourite cuisine restaurants among the many diversified restaurants.

So in this capstone I have analysed particularly best source of Indian cuisine restaurants in New York.

People Interested: This analysis will be useful the following people:

- Any immigrant or person or any visitor who have no prior knowledge of the neighbourhoods of New York and want to explore the best rated restaurants with Indian cuisine.
- Any company or individual to is planning to open Indian Restaurant in the neighbourhood of New York and want to know which area have potential Indian restaurant market.

Problem

In this capstone we will find answers to the following questions.

1) List and visualize all the places with best available in NY with Indian food.
2) What are some best restaurants with Indian cuisine based on given rating, likes and tips by the previous visited customers?
3) Which area (borough) have potential of Indian restaurant market?
4) Which place ranks the least for Indian restaurant?

5) Which place you should settle in New York in case you prefer Indian restaurants in your neighborhoods?

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.
 o Data source : https://cocl.us/new_york_dataset
 o 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.
 o Data source: Foursquare API
 o 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
 o Data source : https://data.cityofnewyork.us/City-Government/BoroughBoundaries/tqmj-j8zm
 o Description: By using this geo space data we will get the New York Borough boundaries that will help us visualize choropleth map.

Methodology

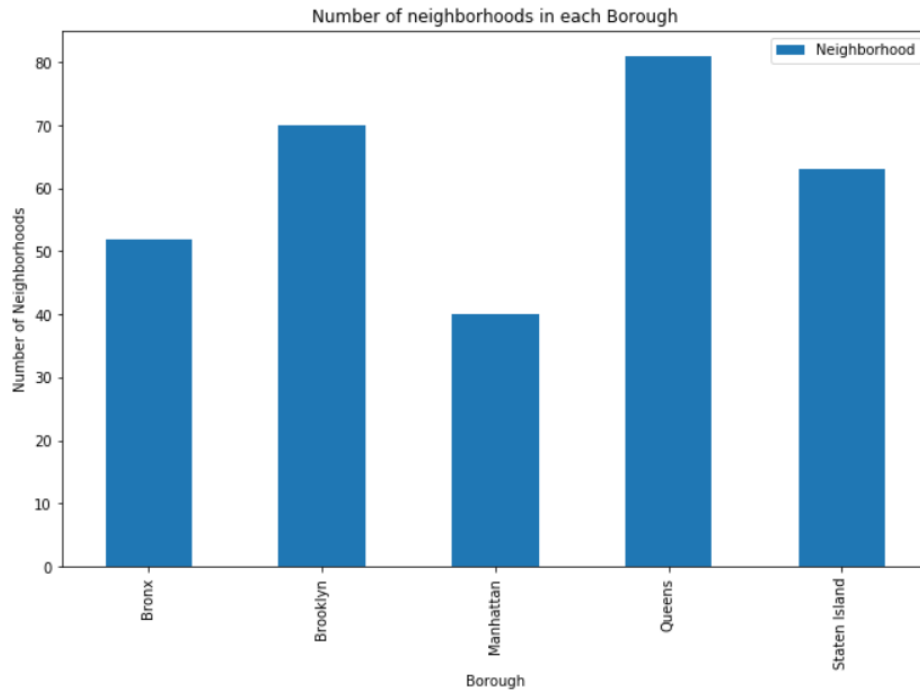1. First we get the New York dataset from the above mentioned link.

```
[5]: new_york_data.head()
```

	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

```
[6]: new_york_data.shape
```
```
[6]: (306, 4)
```

2. Visualize the number of neighborhoods in New York.

Number of neighborhoods in each Borough

3. Next, find all the Indian restaurants in the neighborhoods of New York.

```
( 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
```

4. We construct Dataframe with all Indian restaurants in NY.

```
[21]:  indian_rest_ny.head()
```

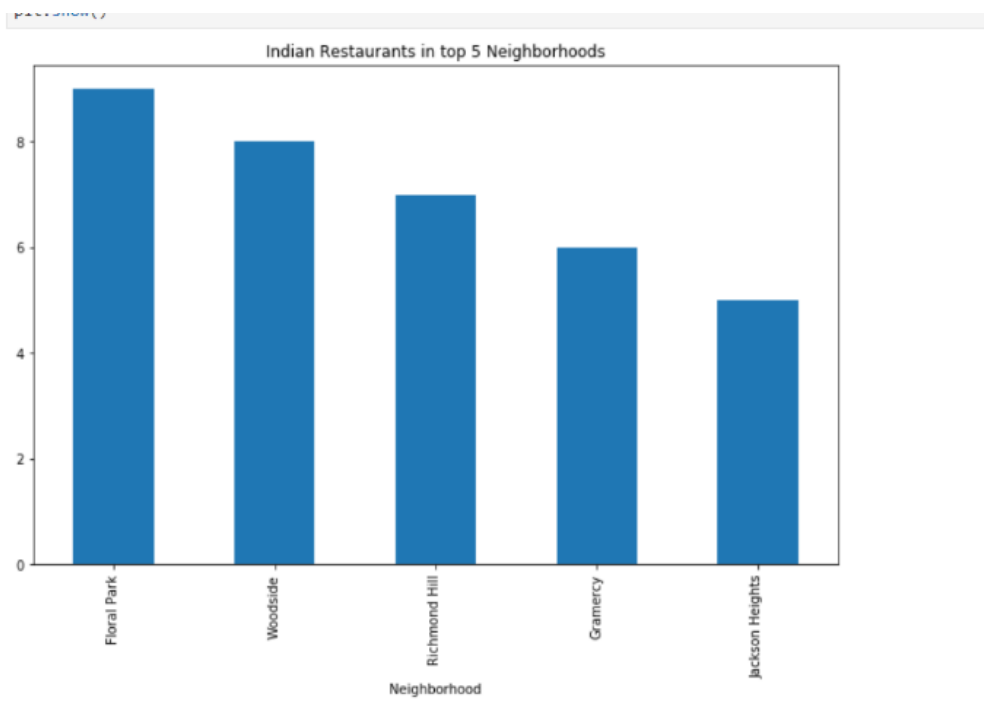|	Borough	Neighborhood	ID	Name
0	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot
1	Bronx	Parkchester	4c194631838020a13e78e561	Melanies Roti Bar And Grill
2	Bronx	Spuyten Duyvil	4c04544df423a593ac83d116	Cumin Indian Cuisine
3	Bronx	Concourse	551b7f75498e86c00a0ed2e1	Hungry Bird
4	Bronx	Unionport	4c194631838020a13e78e561	Melanies Roti Bar And Grill

```
[22]:  indian_rest_ny.shape
```

```
[22]:  (144, 4)
```

By this we can see there are 144 Indian restaurants in New York Neighborhoods

5. Visualize the number of Indian restaurant in the top 5 neighbourhood.

Indian Restaurants in top 5 Neighborhoods

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

```
[27]:  indian_rest_ny_stat.head()
```

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot	5.0	7.8	10.0
1	Bronx	Parkchester	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3.0	6.0	2.0
2	Bronx	Spuyten Duyvil	4c04544df423a593ac83d116	Cumin Indian Cuisine	13.0	6.0	9.0
3	Bronx	Concourse	551b7f75498e86c00a0ed2e1	Hungry Bird	8.0	6.8	3.0
4	Bronx	Unionport	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3.0	6.0	2.0

```
[28]:  indian_rest_ny_stat.shape
```

```
[28]:  (144, 7)
```

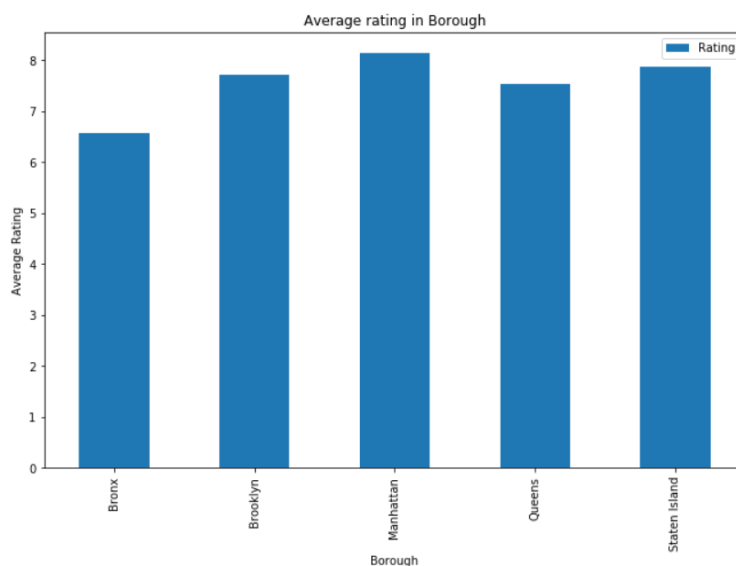7. Let's see neighborhoods with maximum average ratings.

	Neighborhood	Rating
0	Astoria	9.0
5	Blissville	9.0
25	Fort Greene	8.8
49	Prospect Heights	8.7
12	Civic Center	8.6
71	West Village	8.6
66	Tribeca	8.6
21	Emerson Hill	8.6
31	Greenwich Village	8.6
14	Concord	8.6

8. Let's see borough with maximum average ratings.

	Borough	Rating
2	Manhattan	8.139394
4	Staten Island	7.866667
1	Brooklyn	7.707407
3	Queens	7.531884
0	Bronx	6.566667

9. Visualize it.

Thus we can see that Manhattan Borough is best if you like Indian cuisine

10. Next we will get the top 5 Indian restaurants in neighborhood with ratings as constrain.

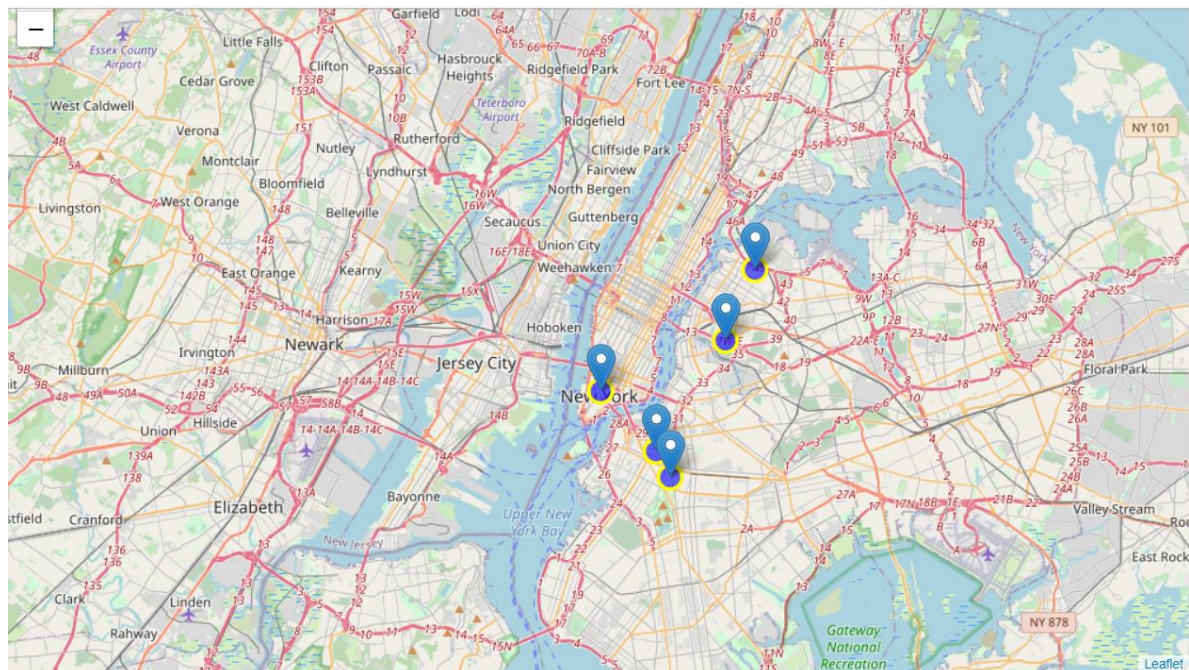|	Neighborhood	Rating
0	Astoria	9.0
5	Blissville	9.0
25	Fort Greene	8.8
49	Prospect Heights	8.7
12	Civic Center	8.6

This shows the top five neighborhoods in NY with best Indian cuisine

11. We will merge this data with original NY dataset to get latitudes and longitudes.

	Borough	Neighborhood	Latitude	Longitude	Rating
0	Brooklyn	Prospect Heights	40.676822	-73.964859	8.7
1	Brooklyn	Fort Greene	40.688527	-73.972906	8.8
2	Queens	Astoria	40.768509	-73.915654	9.0
3	Manhattan	Civic Center	40.715229	-74.005415	8.6
4	Queens	Blissville	40.737251	-73.932442	9.0

12. Next, we will visualize the data on the map.

Results.

Now we can answer the following question mentioned above.

- Some of the places to visit in NY for Indian cuisine are:

	Borough	Neighborhood	Latitude	Longitude	Rating
0	Brooklyn	Prospect Heights	40.676822	-73.964859	8.7
1	Brooklyn	Fort Greene	40.688527	-73.972906	8.8
2	Queens	Astoria	40.768509	-73.915654	9.0
3	Manhattan	Civic Center	40.715229	-74.005415	8.6
4	Queens	Blissville	40.737251	-73.932442	9.0

- Prospect Heights(Brooklyn), Fort Greene(Brooklyn), Astoria(Queens) are some of the best place with Indian cuisine.
- Manhattan has potential Indian restaurant market.
- Parkchester in Bronx ranks last in average ratings in NY.
- You should live in Manhattan if you prefer Indian cuisine.

Discussions

I realised that only there were two restaurants with rating 9.0 and all other are below 9.0. There is a chance that there is very less restaurants providing good Indian food with the authentic Indian taste.

This analysis can be improved for best results including a through analysis of all the states of US to find best city with great Indian food. This analysis can be also done on othere type of cuisine you are interested in.

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.