Predicting the best Location for Indian cuisine in New-York city

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1.1 Background

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 nearly 8.5 million people in 2014, 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. Over the last decade the city has been growing faster than the region. The New York region continues to be by far the leading metropolitan gateway for legal immigrants admitted into the United States.

Throughout its history, New York City has been a major point of entry for immigrants; the term "melting pot" was coined to describe densely populated immigrant neighborhoods on the Lower East Side. As many as 800 languages are spoken in New York, making it the most linguistically diverse city in the world. English remains the most widely spoken language, although there are areas in the outer boroughs in which up to 25% of people speak English as an alternate language, and/or have limited or no English language fluency. English is least spoken in neighborhoods such as Flushing, Sunset Park, and Corona. 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

1.2 Problem statement

In USA there are many people who like Indian Food but it is hard to find a Good restaurant with High rating and Recommendation. So as part of this project, we will list and visualize all major parts of New York City that has great Indian restaurants.

1.3 Interest

- The main object of this project is to find the 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 I prefer Indian Cuisine ?

2. Data Sources and Approach

2.1 Data sources

The data sources used are

- Data source : https://cocl.us/new_york_dataset

Description - his data set contains the required information. And we will use this data set to explore various neighborhoods of new york city. Indian 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 Indian Restaurants.

- 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 to visualize choropleth map

2.2 Project Approach

- Collect the New York city data from https://cocl.us/new_york_dataset
- Using Foursquare API we will find all venues for each neighborhood.
- Filter out all venues that are Indian Restaurants.
- Find rating, tips and like count for each Indian Restaurants using Foursquare API.
- Using rating for each restaurant, we will sort that data.
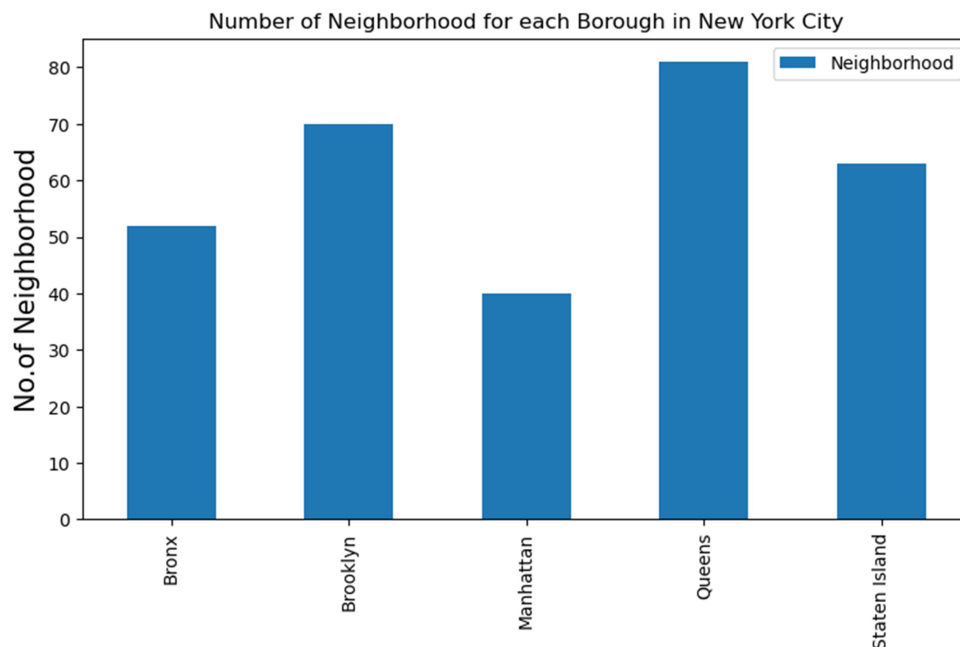
3. Exploratory Data Analysis

3.1 Extract the names of Borough and Neighborhood from New-york dataset with corresponding Latitudes and longitudes

```python
new_york_data = new_york_data.append({'Borough': borough,
                                      'Neighborhood': neighborhood_name,
                                      'Latitude': neighborhood_lat,
                                      'Longitude': neighborhood_lon}, ignore_index=True)
```

	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

3.2 Number of Neighborhoods for each borough

Next step was to find the distribution of Number of boroughs in New York city using a bar plot in the matplotlib library.
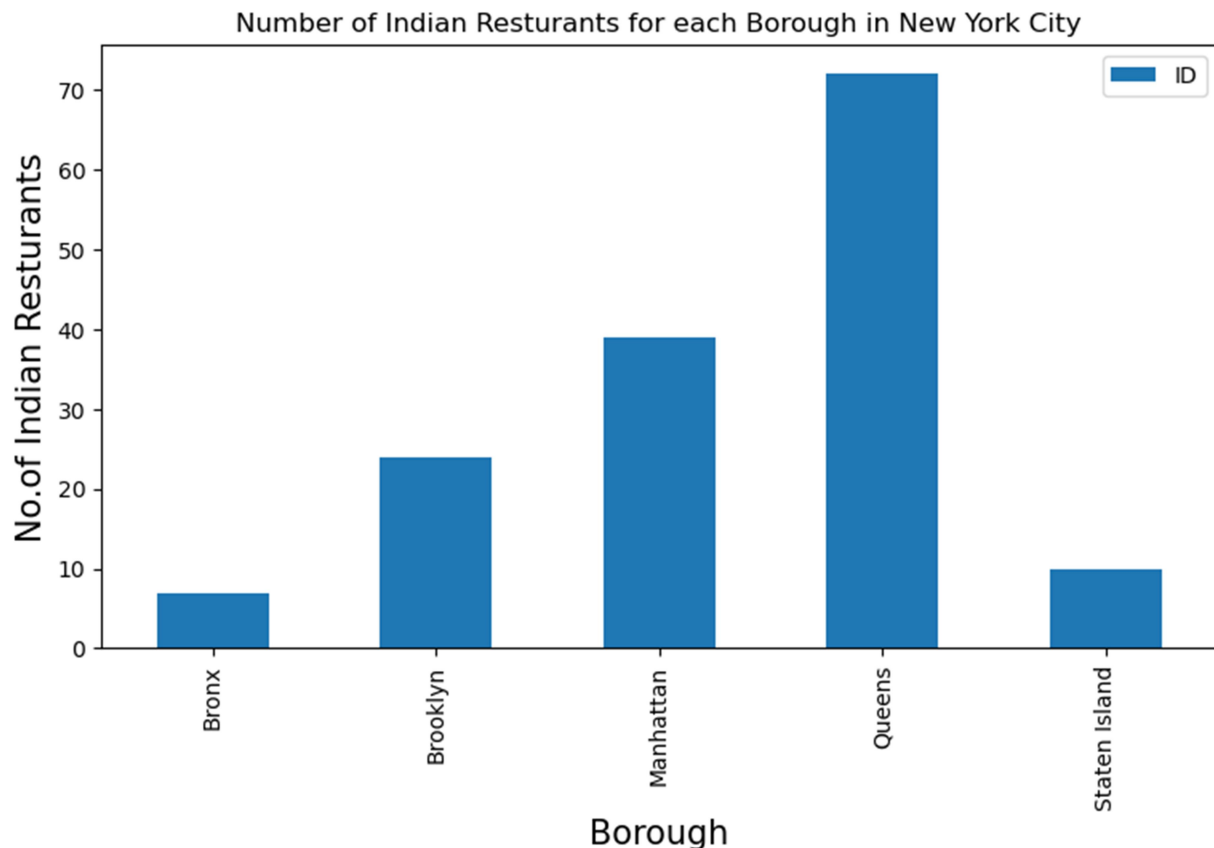
3.3 Number of Indian Restaurants for each borough

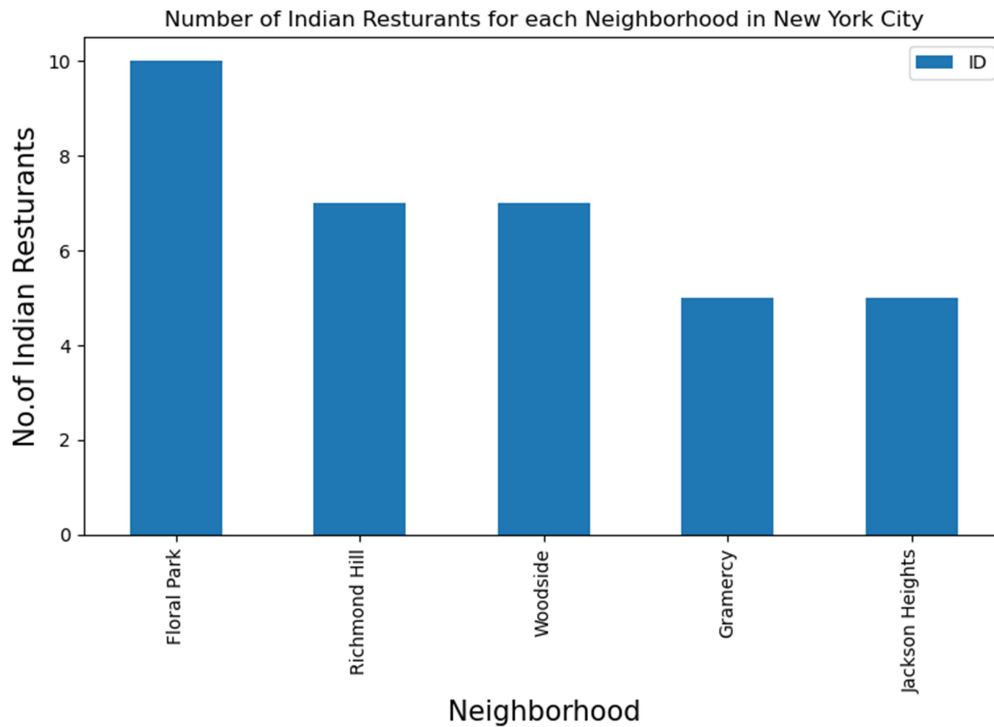Next step was to prepare a list of boroughs that contain Indian Restaurants

```
( 293 / 306 ) Indian Resturants in Lighthouse Hill, Staten Island:0
( 294 / 306 ) Indian Resturants in Richmond Valley, Staten Island:0
( 295 / 306 ) Indian Resturants in Malba, Queens:0
( 296 / 306 ) Indian Resturants in Highland Park, Brooklyn:0
( 297 / 306 ) Indian Resturants in Madison, Brooklyn:0
( 298 / 306 ) Indian Resturants in Bronxdale, Bronx:0
( 299 / 306 ) Indian Resturants in Allerton, Bronx:0
( 300 / 306 ) Indian Resturants in Kingsbridge Heights, Bronx:0
( 301 / 306 ) Indian Resturants in Erasmus, Brooklyn:1
( 302 / 306 ) Indian Resturants in Hudson Yards, Manhattan:0
( 303 / 306 ) Indian Resturants in Hammels, Queens:0
( 304 / 306 ) Indian Resturants in Bayswater, Queens:0
( 305 / 306 ) Indian Resturants in Queensbridge, Queens:2
( 306 / 306 ) Indian Resturants in Fox Hills, Staten Island:1
```

Plot the number of Indian restaurants for each borough

3.4 Find the number of Indian Restaurants for each neighborhood

Next step was to prepare a list of neighborhoods that contain Indian Restaurants. Bar plot

	Borough	Neighborhood	ID	Name
105	Queens	Floral Park	4e4e3e22bd4101d0d7a5c2d1	Kerala Kitchen
106	Queens	Floral Park	527ffc0811d2d329d5e49abd	Jackson Diner
107	Queens	Floral Park	4b647b56f964a520c4b62ae3	Usha Foods & Usha Sweets
108	Queens	Floral Park	4b787c49f964a5209cd12ee3	Santoor Indian Restaurant
109	Queens	Floral Park	4c0c01e0bbc676b00d6b4cd5	Mumbai Xpress
110	Queens	Floral Park	4c76ff35a5676dcb72671721	Flavor Of India
111	Queens	Floral Park	4df0f39dd4c04d0392c853ea	Sagar Chinese
112	Queens	Floral Park	4c953a7672dd224bd8d1a191	Real Usha Sweets & Snacks Inc.
113	Queens	Floral Park	4ec1b54f4690d2338a359d66	Tabaq Kebab Grill
114	Queens	Floral Park	4e6bfe1c7d8b2c711b17bbe5	Surya sweets and snacks

Tabular form

3.5 List of likes, Ratings, and Tips for each Indian restaurant using foursquare API :Next step is to extract a table with list of restaurants with likes, Ratings and tips

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot	5	7.4	10
1	Bronx	Parkchester	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3	5.9	2
2	Bronx	Spuyten Duyvil	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	5.9	9
3	Bronx	Concourse	551b7f75498e86c00a0ed2e1	Hungry Bird	8	7.1	3
4	Bronx	Unionport	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3	5.9	2

4. Results

4.1 Restaurant with Maximum Likes

```
Borough                      Manhattan
Neighborhood                   Midtown
ID               49d91c12f964a520015e1fe3
Name             The Kati Roll Company
Likes                            834
Rating                           8.6
Tips                             256
Name: 38, dtype: object
```

4.2 Restaurants with Maximum Ratings

```
Borough                      Manhattan
Neighborhood                   Tribeca
ID               4bbb9dbded7776b0e1ad3e51
Name                 Tamarind TriBeCa
Likes                            601
Rating                           9.1
Tips                             151
Name: 43, dtype: object
```
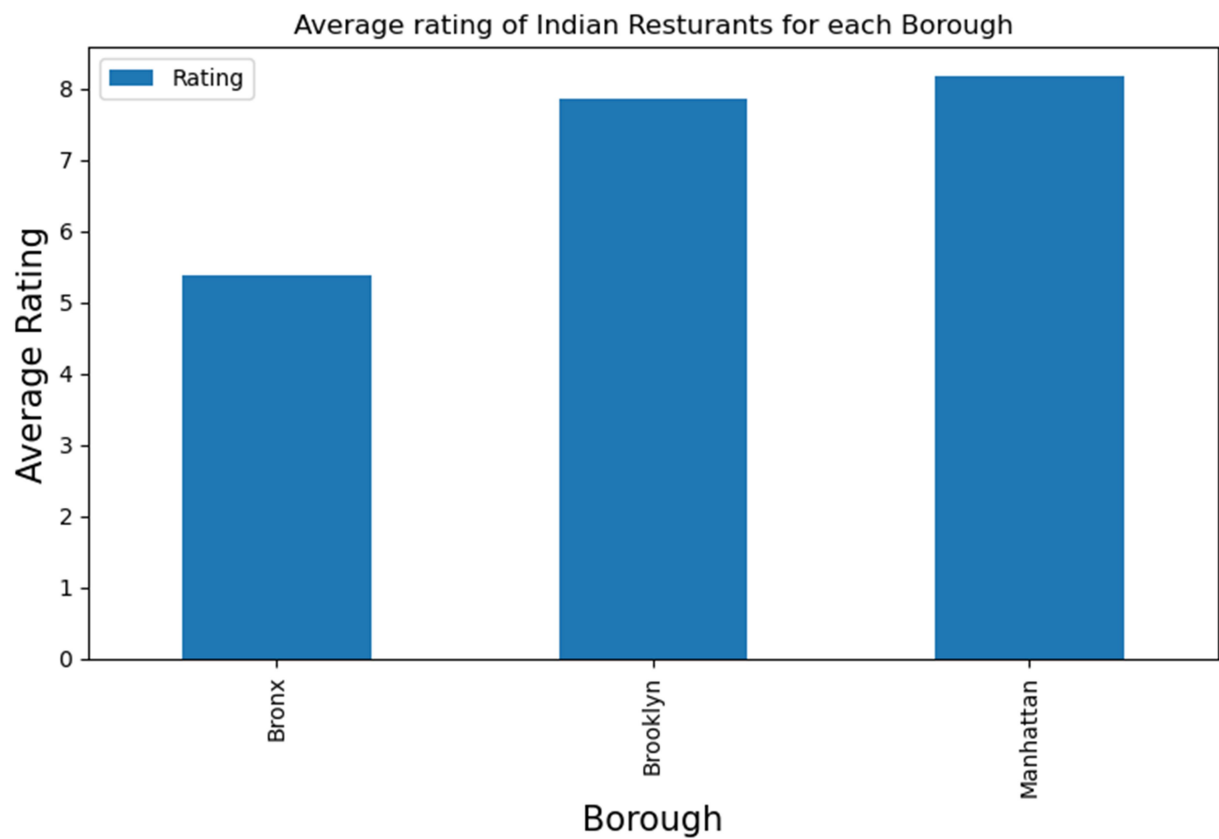
4.3 Restaurants with Maximum Tips

```
Borough                         Manhattan
Neighborhood                      Midtown
ID              49d91c12f964a520015e1fe3
Name              The Kati Roll Company
Likes                                 834
Rating                                8.6
Tips                                  256
Name: 38, dtype: object
```
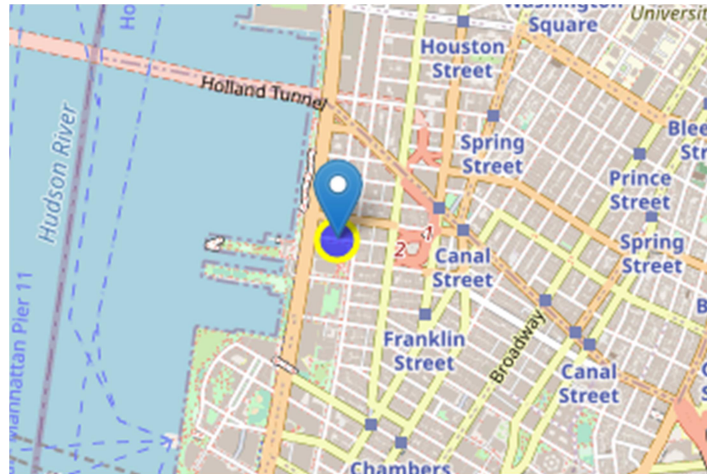
4.4 Average rating of Indian Restaurants for each borough

4.5 Location of Restaurant on MAP using Folium

	Neighborhood	Average Rating	Borough	Latitude	Longitude
0	Tribeca	9.1	Manhattan	40.721522	-74.010683

5. **Conclusion:**

In conclusion we were able to derive the following points:

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

6. **Future Developments**

As seen from the results we could predict the preferable places to stay according to Indian cuisine in New York. In similar way using the same data analysis approach we can predict the best place to stay according to Indian supermarkets, Indian localities for other parts of country.