The Battle of Neighborhoods

A. Introduction

A.1. Description & Discussion of the Background

New York can be called the financial capital of the world. As a metropolis, it has rich and diverse culture where people from all over the world come to work. Owing to the liberal immigrant laws of the US, many have made it their home. This brings myriads of culture to the city making New York a multicultural city. In such a multicultural city, people often work as much as they socialize culturally. Apart from working in sophisticated sectors they have started their business too. One of such venues for socializing are the restaurants of the city, many of which are being run by immigrants from all across the world.

Since restaurants serve a purpose of spending time with friends and families, it turns out to be a profitable business. So much so that an increasingly number of people are investing in food and beverage business in New York.

In such a scenario, we intend to build a solution that helps the new investors in their decision making for a new investment that is profitable. This can be effectively done by using data driven technologies like Data Science which makes recommendation on the profitable parameters to the people who need to make a decision.

A.2. Data Description

The data to be used for building this solution will primarily be the location data fetched from Foursquare website that helps you discover and share information about businesses and attractions around a location.

Below is the sample of the locality data that will be used

(Source: https://cocl.us/new_york_dataset)

	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

The about the restaurants in New York will be further used to do the requisite analysis

(Source: Foursqaure)

name	categories	address	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country
Harry's Italian Pizza Bar	Pizza Place	225 Murray St	40.715218	-74.014739	[{'label': 'display', 'lat': 40.71521779064671...	77	10282	US	New York	NY	United States
Conca Cucina Italian Restaurant	Food	63 W Broadway	40.714484	-74.009806	[{'label': 'display', 'lat': 40.71448400000000...	499	10007	US	New York	NY	United States

Geospatial data for New York City will be used to make the visualization easy to understand for the business decision makers (Source https://bit.ly/35TyKLh)

B. Methodology

First the data was acquired about the NY city from the source as mentioned above. And an exploratory data analysis was done to check the basic behavior of the data.
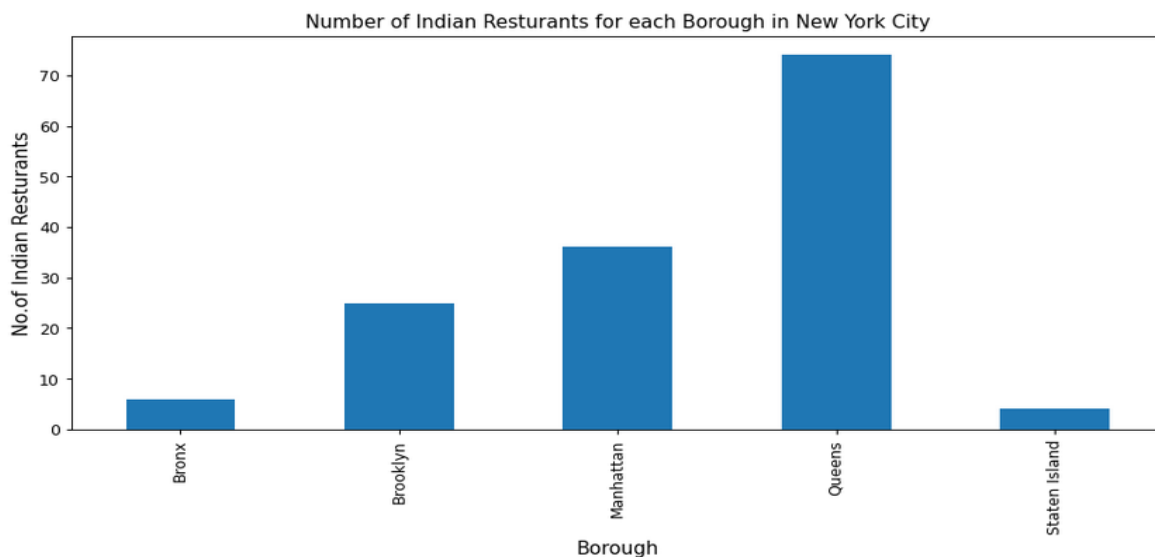
Out[5]:

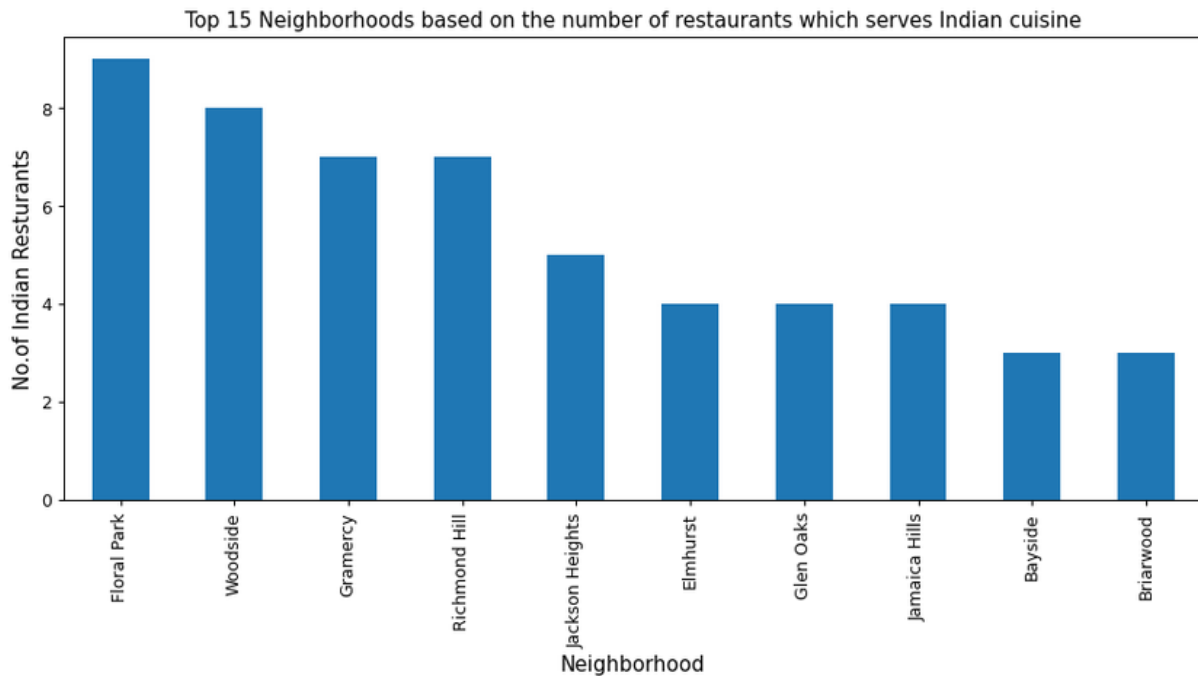|	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

Then the data about neighborhood having Indian restaurants was taken. This data would tell how many restaurants are located in which borough of the NY City. And was visualized as the following bargraph.

Out[14]:

	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

Number of Indian Resturants for each Borough in New York City

It is necessary to know the distribution of restaurants in the neighborhoods to proceed for further analysis. The below bar graph meets the purpose

Top 15 Neighborhoods based on the number of restaurants which serves Indian cuisine

Later, analysis was done for top locality with most number of Indian restaurants. It gave an insight about the trend of the restaurants in borough and neighborhood.

Now it was required to get the venue related information like likes, rating and tips for all the venues of the boroughs which were already analyzed in previous steps.
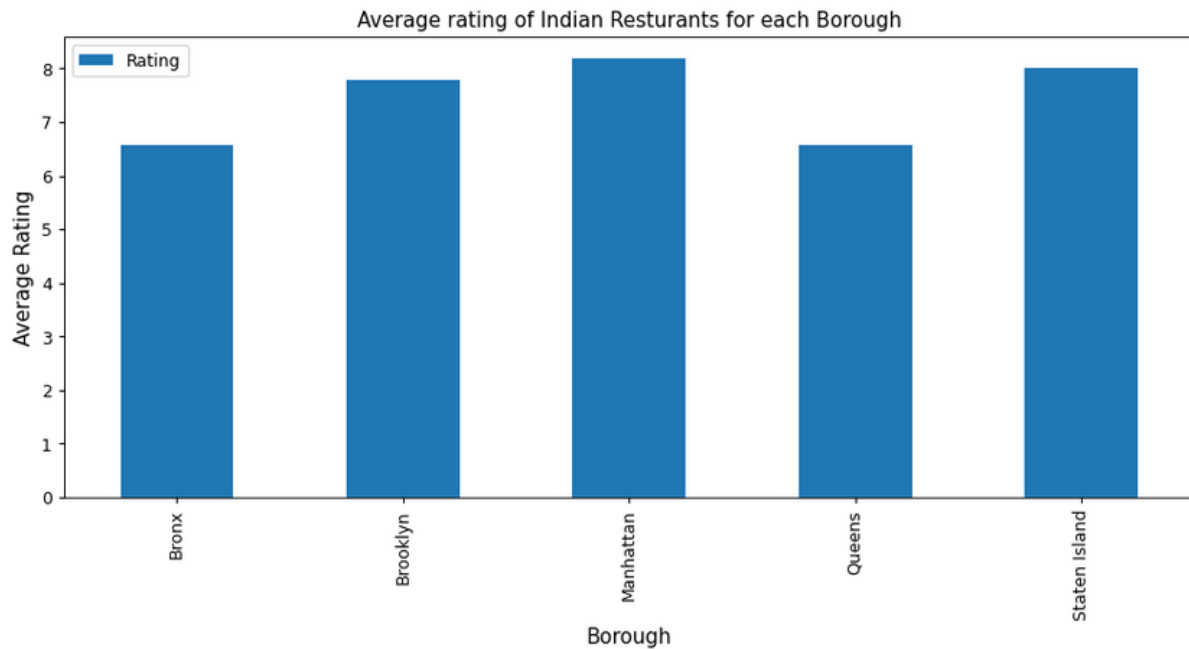
For this, premium calls were made to the Foursquare API which resulted in the details for 144 restaurants.

Out[19]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
140	Queens	Blissville	5b931ea69d7468002c3b1382	Adda	129	9.0	35
141	Brooklyn	Broadway Junction	5539753f498edbace4746b67	Tandoori Masala	12	7.9	2
142	Brooklyn	Erasmus	564d283d498e6e851df79d87	Great Indian Curry	3	6.9	2
143	Queens	Queensbridge	50a287a7e4b0033f830f06db	Raj's Indian Kitchen	25	7.7	12
144	Queens	Queensbridge	4b1b341bf964a5208af923e3	Five Star Banquet	30	7.0	31

A list was also prepared about the top 10 neighborhoods having highest average ratings for Indian restaurants as well as boroughs having highest average rated

Indian restaurants. This list would give us more clarity about which borough is visited more.

Average rating of Indian Resturants for each Borough

C. Results

In the last, a list of restaurants was made which serve Indian cuisine and have one of the highest ratings, in this case equal to or above 8.5

Out[32]:

	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	8.6
3	Brooklyn	Clinton Hill	40.693229	-73.967843	8.8
4	Brooklyn	Fort Greene	40.688527	-73.972906	8.8
5	Queens	Holliswood	40.720957	-73.767142	8.5
6	Manhattan	Murray Hill	40.748303	-73.978332	8.6
7	Queens	Murray Hill	40.764126	-73.812763	8.6
8	Manhattan	Noho	40.723259	-73.988434	8.5
9	Brooklyn	Prospect Heights	40.676822	-73.964859	8.7
10	Brooklyn	Prospect Lefferts Gardens	40.658420	-73.954899	8.7

The restaurants were mapped to their locations and ratings and were finally plotted on a folium map, which was later extended to a choropleth map of the related neighborhoods as below.

D. Conclusion

The graph clearly depicts the neighborhoods which have highest rated restaurants and can be considered as good and profitable localities for Indian restaurants.

As per the above map:

1. The best three neighborhoods for Indian restaurants are
    1. Astoria(Queens)
    2. Blissville(Queens)
    3. Civic Center(Manhattan)
2. Staten Island ranks last in average rating of Indian restaurants.
3. Manhattan is the best place to stay if you prefer Indian cuisine.
4. Manhattan has potential Indian restaurants market