Analysis on Indian Cuisine in New York City

1 Introduction

1.1 Background

New York is the most populous city in the United States with a population of 8,398,748 according to Wikipedia and New York is the most densely populated major city in United States. New York being the popular city all around the world it also known for the great variety of restaurants all over the city.
As quoted from google, *"First we eat, then we do everything else -M.F.K. Fisher"*

1.2 Problem

The intention is to study the ratings of Indian restaurants all over the city ad to see which cities offer the best Indian cuisine.

1.3 Interests

This analysis can be used to understand the distribution of Indian cultures and cuisines over 'the most diverse city on the planet — New York City'. Also, it can be utilized by a new food vendor who is willing to open his or her restaurant.

2 Data Acquisition and Cleaning

New York City Data
https://en.wikipedia.org/wiki/New_York_City
https://en.wikipedia.org/wiki/Demographics_of_New_York_City

Foursquare API
https://developer.foursquare.com

3 Methodology

In order to segment the neighborhoods of New York City, a dataset is required that contains the boroughs and the neighborhoods, that exist in each borough, with respective latitude and longitude coordinates. This dataset is downloaded using the mentioned URL. Data is analyzed to understand the structure of the file. A python dictionary is returned by the URL and all the relevant data is found to be in the features key, which is basically a list of the neighborhoods. The dictionary is transformed, into a pandas dataframe, by looping through the data and filling the dataframe rows one at a time. As a result, a dataframe is created with Borough, Neighborhood, Latitude and Longitude details of the New York City's neighborhood.

The Foursquare API is used to explore the neighborhoods and segment them. To access the API, 'CLIENT_ID', 'CLIENT_SECRET' and 'VERSION' is defined. Some of the work during the analysis is attached below.

```
In [9]: new_york_data.head()
```

Out[9]:

	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

```
In [10]: new_york_data.shape
Out[10]: (306, 4)
```

Figure 1

```
In [19]: indian_rest_ny[indian_rest_ny['Neighborhood']=='Floral Park']
```

Out[19]:

	Borough	Neighborhood	ID	Name
96	Queens	Floral Park	527ffc0811d2d329d5e49abd	Jackson Diner
97	Queens	Floral Park	4e4e3e22bd4101d0d7a5c2d1	Kerala Kitchen
98	Queens	Floral Park	4b647b56f964a520c4b62ae3	Usha Foods & Usha Sweets
99	Queens	Floral Park	4b787c49f964a5209cd12ee3	Santoor Indian Restaurant
100	Queens	Floral Park	4c0c01e0bbc676b00d6b4cd5	Mumbai Xpress
101	Queens	Floral Park	4c76ff35a5676dcb72671721	Flavor Of India
102	Queens	Floral Park	4df0f39dd4c04d0392c853ea	Sagar Chinese
103	Queens	Floral Park	4c953a7672dd224bd8d1a191	Real Usha Sweets & Snacks Inc.
104	Queens	Floral Park	4e6bfe1c7d8b2c711b17bbe5	Surya sweets and snacks

Figure 2

```
In [47]: ny_neighborhood_stats.sort_values(['Average Rating'],ascending=False).head(10)
```

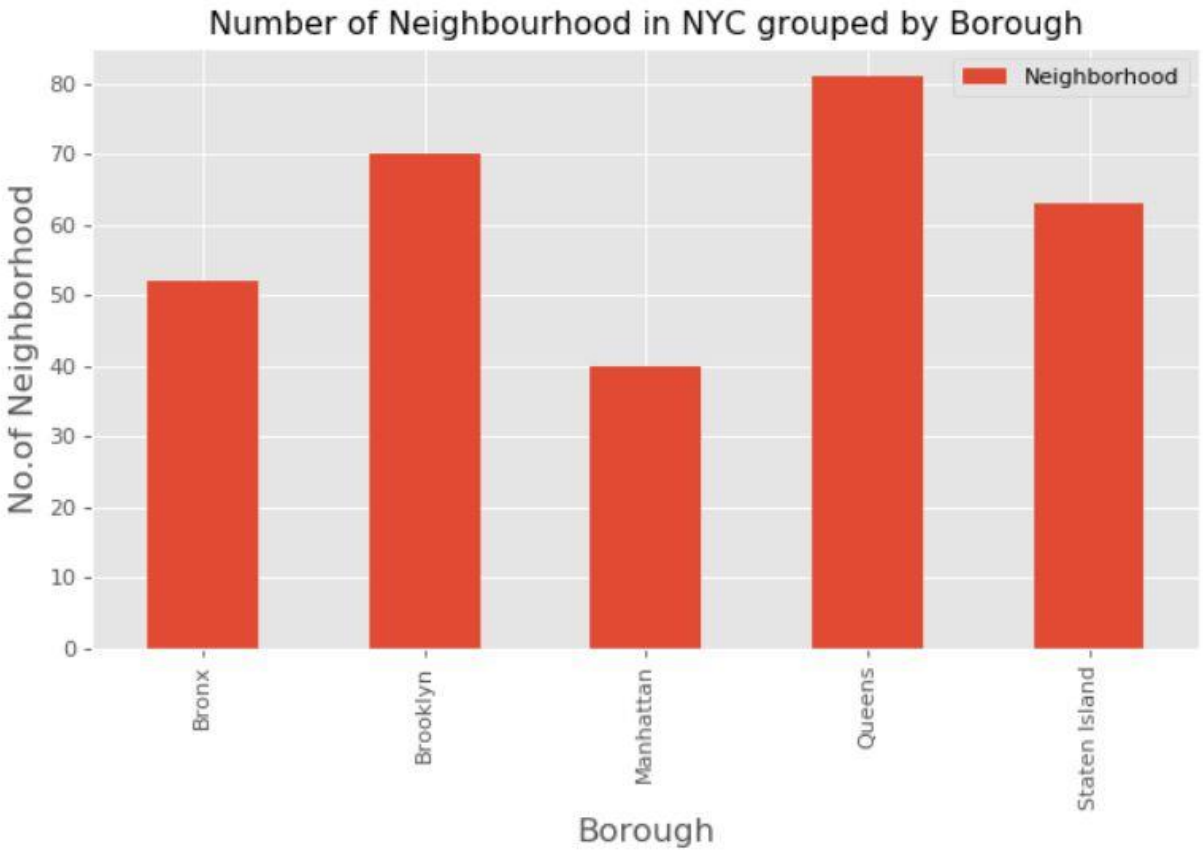
Out[47]:

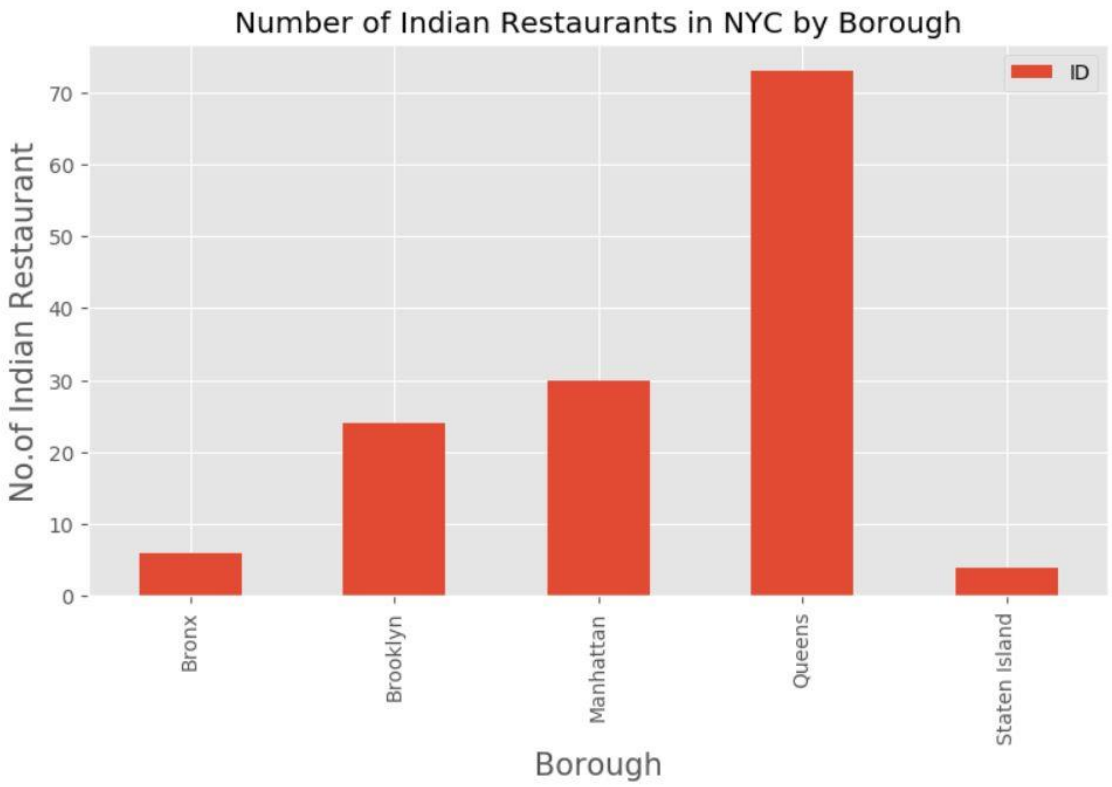
	Borough	Neighborhood	Latitude	Longitude	Average Rating
15	Manhattan	Tribeca	40.721522	-74.010683	9.10
0	Queens	Astoria	40.768509	-73.915654	8.85
10	Queens	Murray Hill	40.764126	-73.812763	8.80
12	Brooklyn	Prospect Heights	40.676822	-73.964859	8.80
9	Manhattan	Murray Hill	40.748303	-73.978332	8.80
6	Brooklyn	Fort Greene	40.688527	-73.972906	8.70
3	Brooklyn	Clinton Hill	40.693229	-73.967843	8.70
16	Manhattan	West Village	40.734434	-74.006180	8.70
5	Manhattan	East Village	40.727847	-73.982226	8.60
14	Brooklyn	South Side	40.710861	-73.958001	8.50

Figure 3

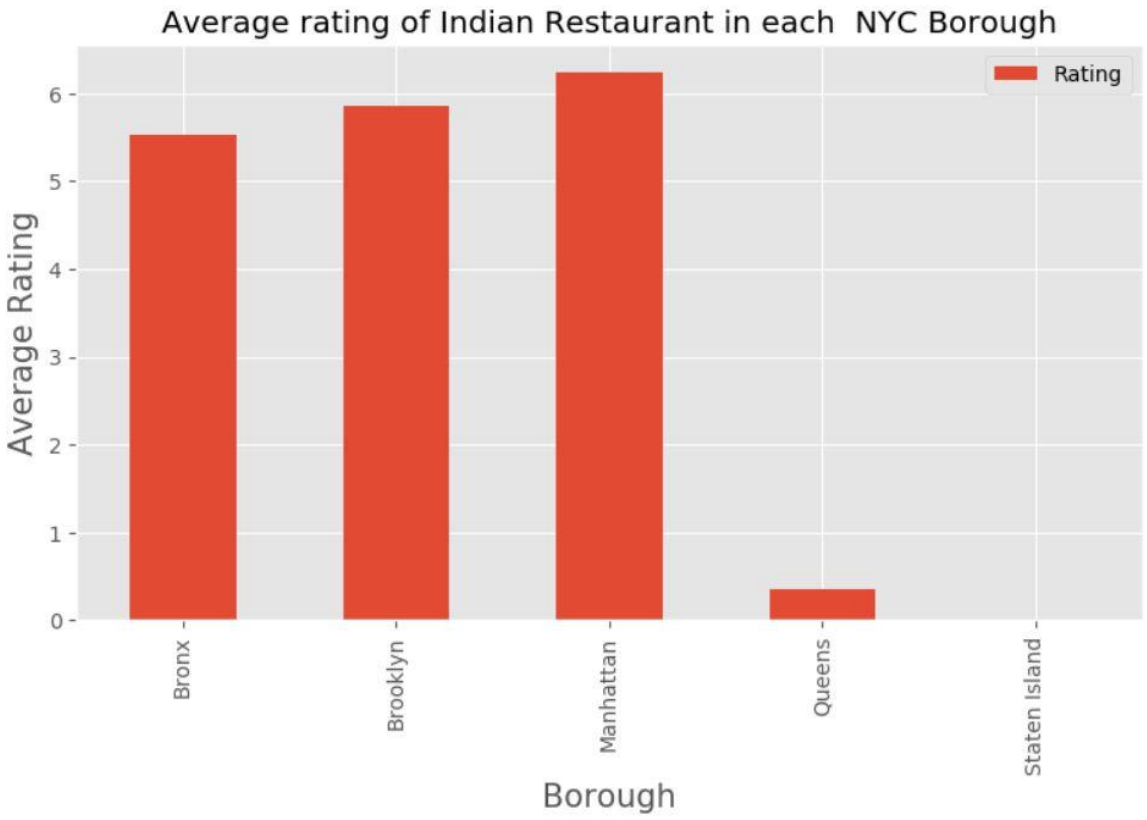
4 Data Visualisation

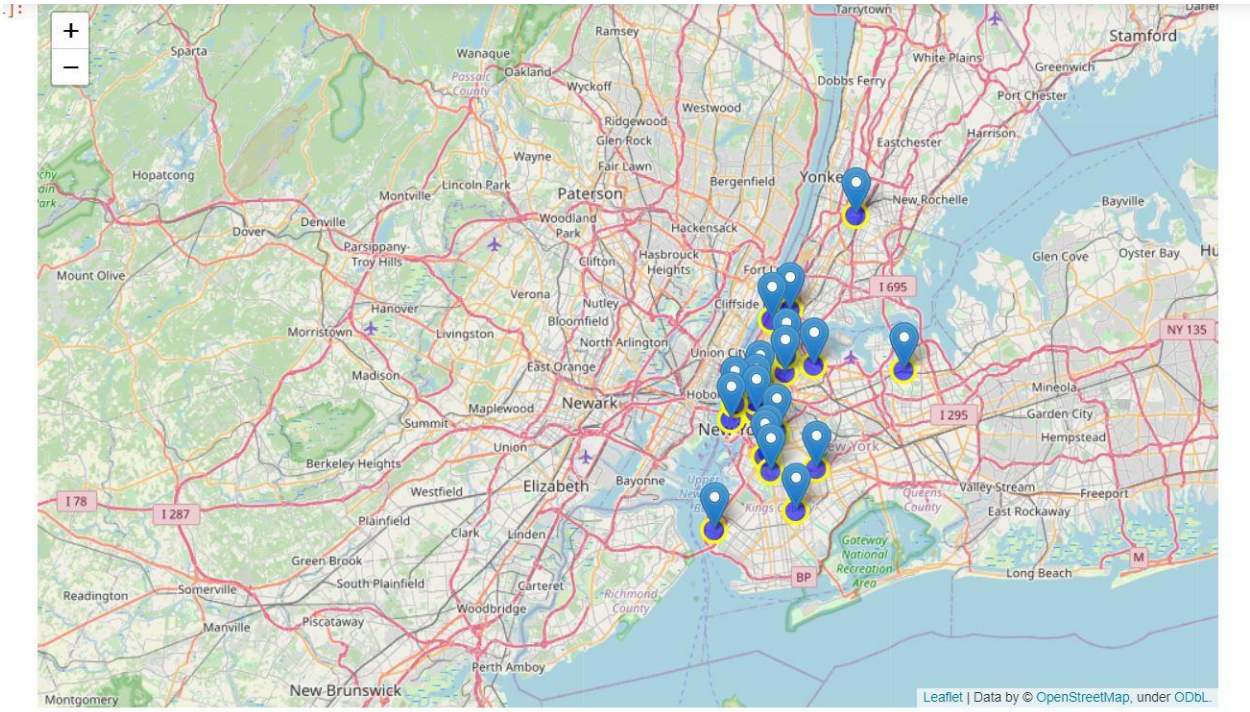
Following graphs were generated in order to have a clear idea of relationships between them.




Number of Indian Restaurants in NYC by Borough
ID
No.of Indian Restaurant
70
60
50
40
30
20
10
0
Bronx
Brooklyn
Manhattan
Queens
Staten Island
Borough


Number of Indian Restaurants in NYC by Neighbourhood
ID
No.of Indian Restaurants
8
6
4
2
0
Floral Park
Jackson Heights
Richmond Hill
Woodside
Elmhurst
Neighborhood


Average rating of Indian Restaurant in each NYC Borough
Rating
Average Rating
0
1
2
3
4
5
6
Bronx
Brooklyn
Manhattan
Queens
Staten Island
Borough


Sparta
Wanaque
Ramsey
Oakland
Passaic County
Wyckoff
Tarrytown
Stamford
White Plains
Greenwich
Dobbs Ferry
Port Chester
Westwood
Ridgewood
Glen Rock
Fair Lawn
Wayne
Eastchester
Harrison
Hopatcong
Lincoln Park
Montville
Paterson
Bergenfield
Yonkers
New Rochelle
Bayville
Dover
Denville
Woodland Park
Hackensack
Parsippany-Troy Hills
Clifton
Hasbrouck Heights
Glen Cove
Oyster Bay
Mount Olive
Verona
Nutley
Cliffside
I 695
Hanover
Bloomfield
Morristown
Livingston
North Arlington
Union City
NY 135
East Orange
Madison
Mineola
Maplewood
Newark
Hoboken
I 295
Garden City
Summit
Hempstead
Union
Berkeley Heights
Elizabeth
Bayonne
Valley Stream
Freeport
I 78
I 287
Westfield
Queens County
East Rockaway
Plainfield
Clark
Linden
Gateway National Recreation Area
Green Brook
BP
Long Beach
South Plainfield
Somerville
Carteret
Richmond County
Readington
Woodbridge
Piscataway
Manville
Perth Amboy
New Brunswick
Montgomery
Leaflet | Data by © OpenStreetMap, under ODbL.

5 Conclusion

Queens is the second most populous urban area in New York City (NYC), behind Brooklyn. However, it is the most ethnically diverse urban area in NYC with the highest Asian ethnic minority population. Even though Manhattan is the third most populous urban area in New York City (NYC), it has a population density of 27,826 people per square km, making it highest of any borough in the United States. It has the second highest Asian ethnic minority population in NYC.

We can observe that Murray Hill, Tribeca, Midtown in Manhattan are some of the best neighborhoods for Indian cuisine and Bronx has the lowest rated Indian Restaurants in New York City. Manhattan is the best place to stay if you love Indian Cuisine.

It can be recommended that Midtown or Tribeca in Manhattan would be the best choice to start a restaurant given that it is the third most populous urban area in New York City (NYC).