# BATTLE OF THE NEIGHBORHOODS : CAPSTONE PROJECT

ANALYSIS OF NEWYORK NEIGHBORHOODS TO IDENTIFY AREAS WITH BEST INDIAN RESTAURANTS AND POSSIBILITY TO ESTABLISH ANOTHER FINE DINING RESTAURANT.

# INTRODUCTION

This project explores the best location for a new Indian restaurant in the city of New York. The need to find and enjoy Indian cuisine is on the rise. Americans' increase in travel and a generation of young chefs eager to showcase their heritage. This increased American appetite for more authentic flavours of Indian food coincides perfectly with a new generation of Indian chefs who want to do more. The validation of Michelin stars and Beard nominations has brought a new generation of diners into Indian restaurants. Even high-end foodies are opening their minds to Indian food and helping to spread its appeal. Indian foods offer much of what the evolving American palate craves, including fresh fruits and vegetables, legumes, bold flavours and whole milk dairy products. With Americans snacking more than ever and looking for fresh alternatives to packaged products, as well as open to exploring global flavours, we believe our products and brand have an opportunity to take Indian food mainstream. This report explores which neighbourhoods and boroughs of New York City have the most as well as the best Indian restaurants, additionally "Where should we open an Amazing Indian Restaurant?" .

**Problem Statement:**

- What is / are the best location(s) for Indian cuisine in New York City?
- In what Neighbourhood and/or borough should I open an Indian restaurant to have the best chance of being successful?
- Where would I go in New York City to have the best Indian food?

# DATA

In order to answer the above questions, data on New York City neighbourhoods, boroughs to include boundaries, latitude, longitude, restaurants, and restaurant ratings and tips are required. New York City data containing the neighborhoods and boroughs, latitudes, and longitudes will be obtained from the data source: https://cocl.us/new_york_dataset New York City data containing neighbourhood boundaries will be obtained from the data source: https://data.cityofnewyork.us/City-Government/Borough-Boundaries/tqmj-j8zm All data related to locations and quality of Indian restaurants will be obtained via the FourSquare API utilized via the Request library in Python.

- Data will be collected from https://cocl.us/new_york_dataset and cleaned and processed into a dataframe.
- FourSquare be used to locate all venues and then filtered by Indian restaurants. Ratings, tips, and likes by
- users will be counted and added to the dataframe.
- Data will be sorted based on rankings
- Finally, the data be will be visually assessed using graphing from various Python libraries.

**<u>Method definition in detail for final Analysis</u>**

We used **Geopy** to get the geocodes i.e latitude and longitude of a given location (Because **Geopy** cannot recognize the address like 'Bronx CB 1', we use the first address in the list of Neighbourhood of each location. If it is still not found, the second address will be used.)

We define function to communicate with FourSquare API and get top 100 venues within a radius of 1000 metres for a given latitude and longitude to give us venue id , venue name and category.
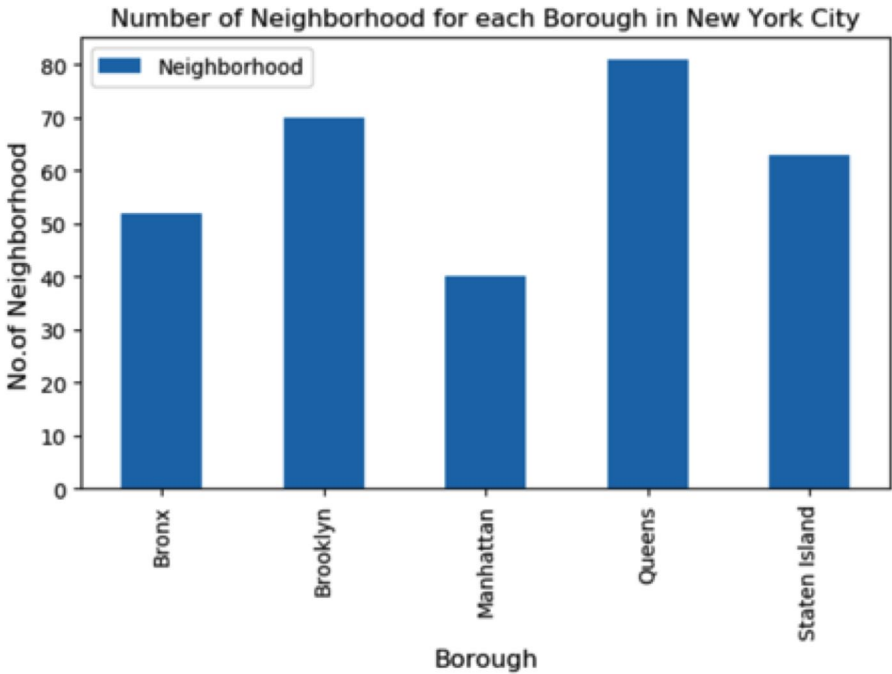
We define function to get venue details like like count , rating , tip counts for a given venue id. This will be used for further analysis and ranking.

We define function to get New york city data " Boroughs, Neighbourhoods along with their latitude and longitude" from url: 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 |

We define the Neighborhoods for each Borough in Newyork City and plot to visualize which Borough have the highest no of Neighborhoods.



Number of Neighborhood for each Borough in New York City

We see that Queens has highest number of neighbourhoods.

Now we define the function that will help collect Indian restaurants for each Neighbourhood so that we can further analyse them.
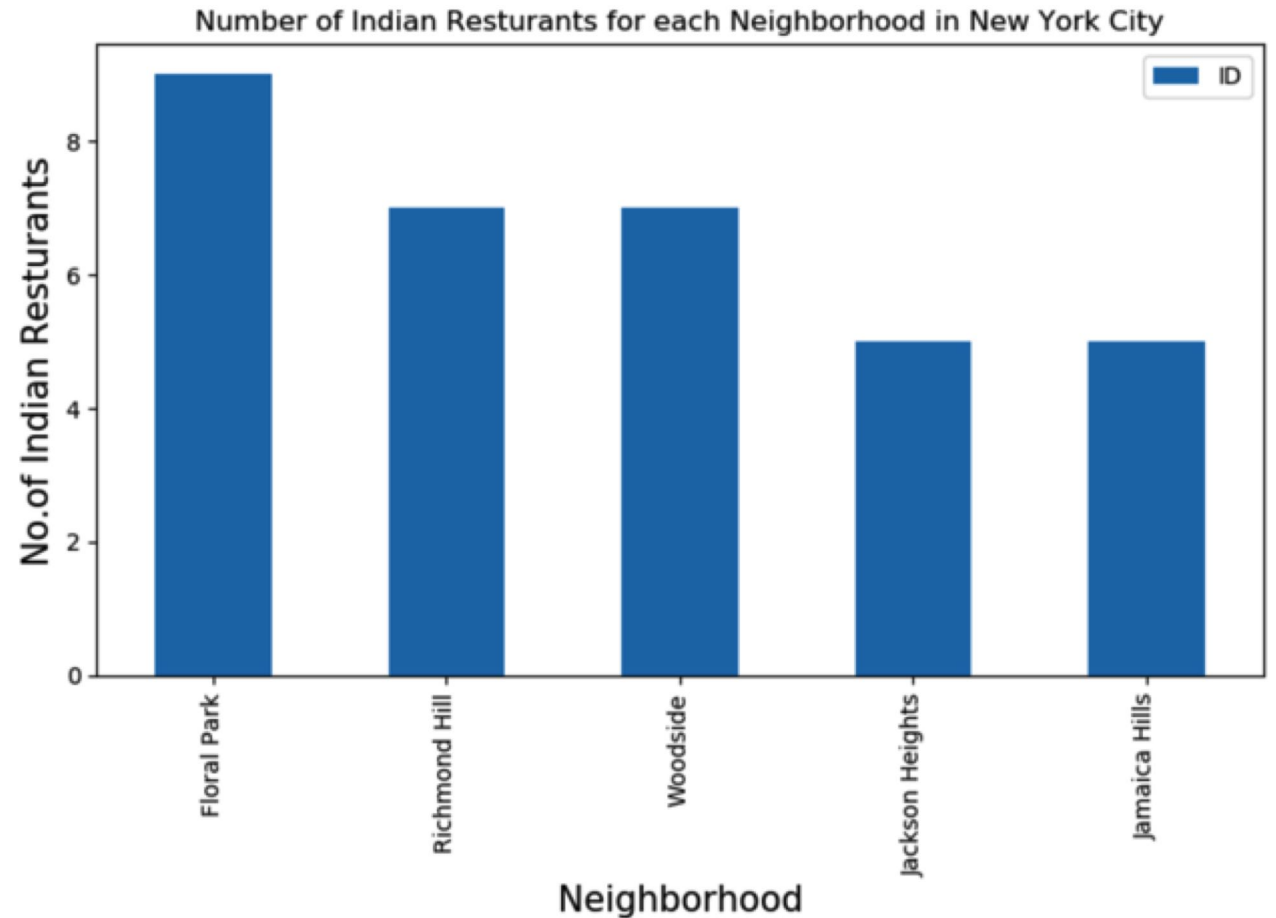
| | Borough | Neighborhood | ID | Name |
|---|---|---|---|---|
| 0 | Bronx | Riverdale | 4c04544df423a593ac83d116 | Cumin Indian Cuisine |
| 1 | Bronx | Kingsbridge | 4c04544df423a593ac83d116 | Cumin Indian Cuisine |
| 2 | Bronx | Woodlawn | 4c0448d9310fc9b6bf1dc761 | Curry Spot |
| 3 | Bronx | Parkchester | 4c194631838020a13e78e561 | Melanies Roti Bar And Grill |
| 4 | Bronx | Spuyten Duyvil | 4c04544df423a593ac83d116 | Cumin Indian Cuisine |

We got 153 Indian Restaurants across New York City. We will further define them by no. of restaurants in each Borough and plot a chart. We see that Queens has the largest number of Indian restaurants

Further analyzing the number of Indian restaurants by neighborhoods. We can see that Floral park has the maximum no. of 9 restaurants.

|  | Borough | Neighborhood | ID | Name |
|---|---|---|---|---|
| 103 | Queens | Floral Park | 527ffc0811d2d329d5e49abd | Jackson Diner |
| 104 | Queens | Floral Park | 4b647b56f964a520c4b62ae3 | Usha Foods & Usha Sweets |
| 105 | Queens | Floral Park | 4b787c49f964a5209cd12ee3 | Santoor Indian Restaurant |
| 106 | Queens | Floral Park | 4e4e3e22bd4101d0d7a5c2d1 | Kerala Kitchen |
| 107 | Queens | Floral Park | 4c0c01e0bbc676b00d6b4cd5 | Mumbai Xpress |
| 108 | Queens | Floral Park | 4c76ff35a5676dcb72671721 | Flavor Of India |
| 109 | Queens | Floral Park | 4df0f39dd4c04d0392c853ea | Sagar Chinese |
| 110 | Queens | Floral Park | 571af96a498e9e392d8d3786 | Namaste Authenic Indian Cuisine |
| 111 | Queens | Floral Park | 51d84192498ea979a3c4f13d | Sunshine Grill & Restaurant |


Number of Indian Resturants for each Neighborhood in New York City

Now we will get the ranking of each restaurant for further analysis by defining the function for Tips, Likes, Rating etc.

Defining the function to get the restaurant with maximum likes, Rating and Tips.

Max Likes

```
Borough                         Manhattan
Neighborhood                      Midtown
ID               49d91c12f964a520015e1fe3
Name                The Kati Roll Company
Likes                                 819
Rating                                  9
Tips                                  257
Name: 43, dtype: object
```

Max Rating

```
Borough                              Manhattan
Neighborhood                           Tribeca
ID                    4bbb9dbded7776b0e1ad3e51
Name                         Tamarind TriBeCa
Likes                                      566
Rating                                     9.2
Tips                                       141
Name: 45, dtype: object
```

Max Tips

```
Borough                         Manhattan
Neighborhood                      Midtown
ID               49d91c12f964a520015e1fe3
Name                The Kati Roll Company
Likes                                 819
Rating                                  9
Tips                                  257
Name: 43, dtype: object
```

Analysing the neighbourhood with maximum average rating of Indian restaurants.

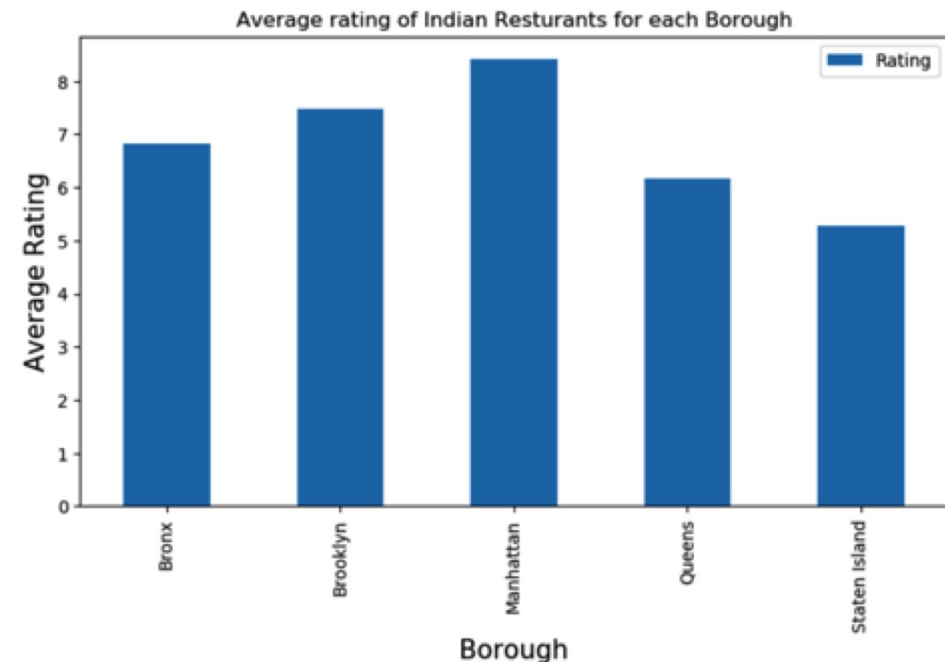|    | Neighborhood    | Average Rating |
|----|-----------------|----------------|
| 0  | Astoria         | 9.200000       |
| 71 | Sunnyside       | 9.200000       |
| 75 | Tribeca         | 9.200000       |
| 5  | Blissville      | 9.200000       |
| 11 | Civic Center    | 9.200000       |
| 47 | Midtown         | 9.000000       |
| 48 | Midtown South   | 9.000000       |
| 30 | Gramercy        | 8.866667       |
| 66 | Roosevelt Island| 8.700000       |
| 53 | North Side      | 8.700000       |

Analysing the Borough with maximum average rating of Indian restaurants.
We can see that Manhattan has the maximum Avg rating among all the
Boroughs.

Which leads us to believe that Manhattan would be the best place for:
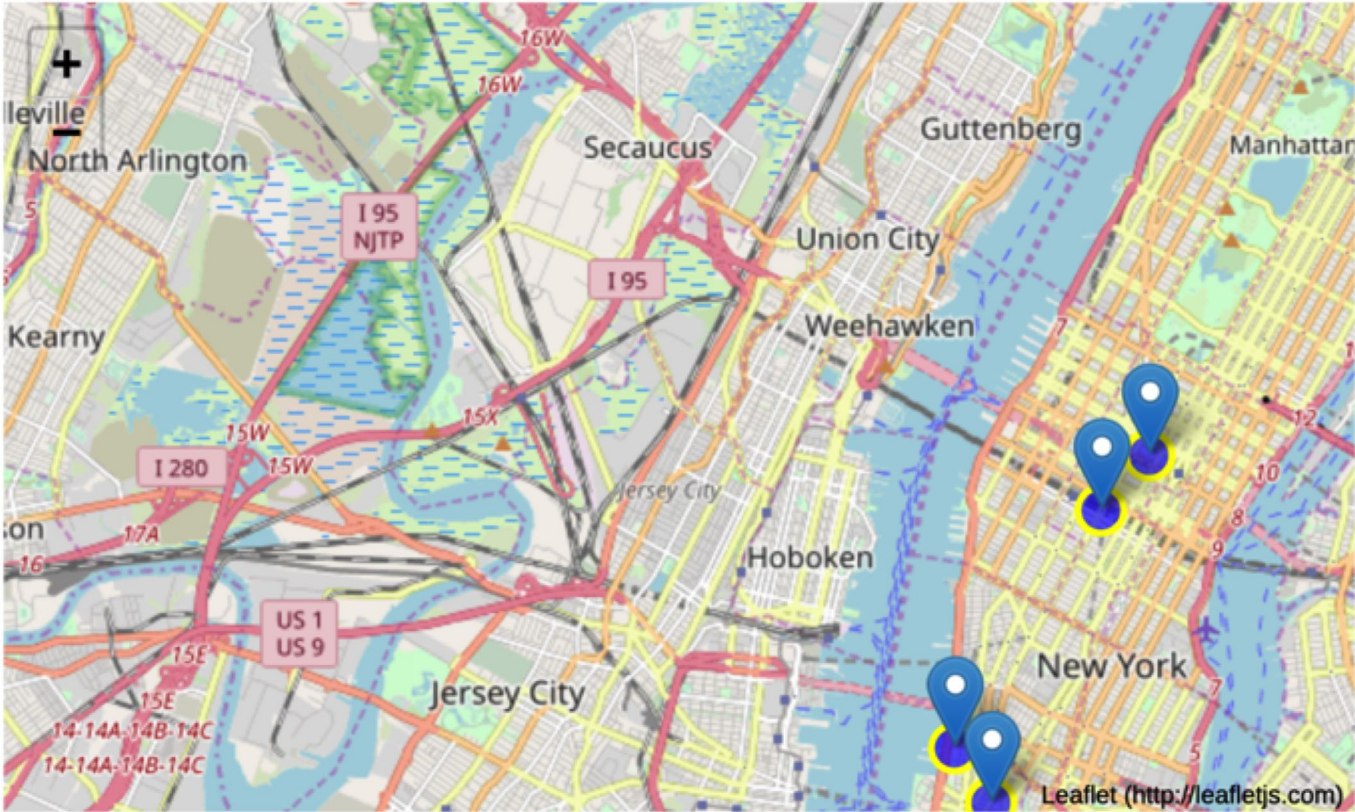
1. Potential new fine dining restaurant.
2. It would also be the best place for fine Indian Cuisine.
3. It would be a good location for  someone who wants to move and stay to enjoy good Indian food.

| | Borough | Average Rating |
|---|---|---|
| 2 | Manhattan | 8.414706 |
| 1 | Brooklyn | 7.478571 |
| 0 | Bronx | 6.812500 |
| 3 | Queens | 6.155844 |
| 4 | Staten Island | 5.266667 |



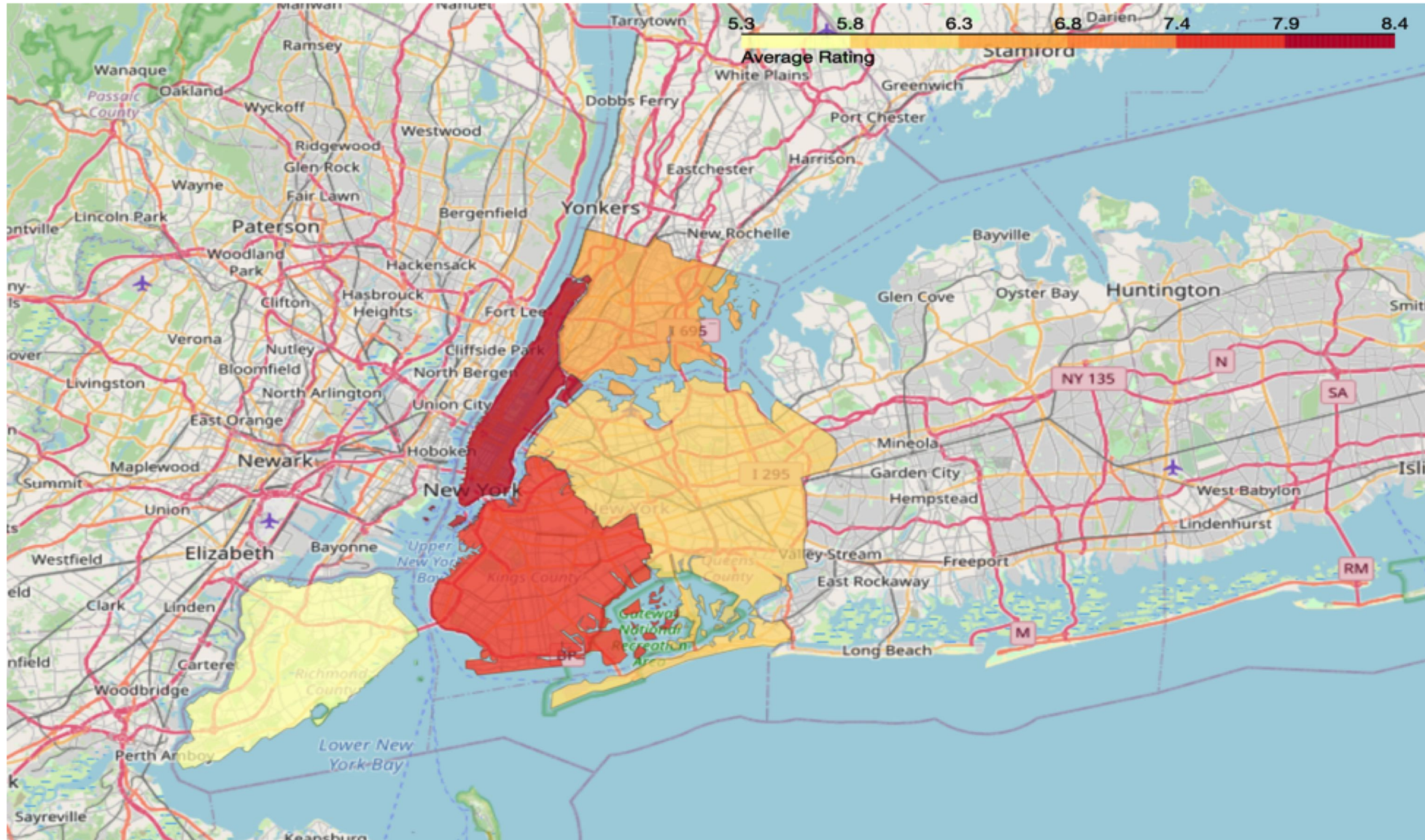Average rating of Indian Resturants for each Borough

We will now further define and consider all the neighbourhoods with average rating greater or equal 9.0 to visualize on map and combine this dataset to original New York data to get longitude and latitude.

| | Borough | Neighborhood | Latitude | Longitude | Average Rating |
|---|---|---|---|---|---|
| 0 | Queens | Astoria | 40.768509 | -73.915654 | 9.2 |
| 1 | Queens | Blissville | 40.737251 | -73.932442 | 9.2 |
| 2 | Manhattan | Civic Center | 40.715229 | -74.005415 | 9.2 |
| 3 | Manhattan | Midtown | 40.754691 | -73.981669 | 9.0 |
| 4 | Manhattan | Midtown South | 40.748510 | -73.988713 | 9.0 |
| 5 | Queens | Sunnyside | 40.740176 | -73.926916 | 9.2 |
| 6 | Staten Island | Sunnyside | 40.612760 | -74.097126 | 9.2 |
| 7 | Queens | Sunnyside | 40.740176 | -73.926916 | 9.2 |
| 8 | Staten Island | Sunnyside | 40.612760 | -74.097126 | 9.2 |
| 9 | Queens | Sunnyside | 40.740176 | -73.926916 | 9.2 |
| 10 | Staten Island | Sunnyside | 40.612760 | -74.097126 | 9.2 |
| 11 | Queens | Sunnyside | 40.740176 | -73.926916 | 9.2 |
| 12 | Staten Island | Sunnyside | 40.612760 | -74.097126 | 9.2 |
| 13 | Manhattan | Tribeca | 40.721522 | -74.010683 | 9.2 |

Now that we have visualized the Neighbourhoods. Lets Visualize Boroughs based on average Rating

**Discussion & Conclusion**

The best locations for good Indian cuisine based on the ratings and Tips are :

- Blissville (Queens),
- Civic Center (Manhattan),
- Astoria (Queens),

They are some of the best neighbourhoods for fine dining Indian cuisine.

The potential opportunity in future will be Manhattan as it seems to be growing and has considerable presence of good Indian restaurants. Based on the highest rating it is the area with the maximum fine and highly rated good Indian cuisine restaurants.

The least favourable location will be Staten Island as it ranks last in average rating of Indian Restaurants.

**Limitations**

The above Analysis and ranking is completely based on Four square based rating of resturants the actual accuracy depends depends on the accuracy of data provided by FourSquare and physical analysis of the locations.

Discussion & Conclusion:

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