Finding Potential Neighborhoods in New York City for Indian Restaurants

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INTRODUCTION

- New York City is the most populous city in the United States

- People have travelled from various parts of the world and inhabited New York

- As different immigrants come from different nations in New York, they bring with them different and unique cultures and food cuisines.

- Different cuisines are not only liked by foreign born residents of New York but also by the natives in the city who like trying different food items

- Opening a foreign-based food cuisine restaurant in New York would thus be a good business idea

BUSINESS PROBLEM

- In this project we look at different neighbourhoods in New York city and conclude which would be a good neighborhood to open an Indian food restaurant. The project would be helpful for audience who have moved from India or South Asia to New York and are looking to set up restaurant business in the city.

- The person who has moved from India to New York can know from the analysis that :

  - which neighbourhoods have maximum number of Indian Restaurants,

  - which neighbourhood has minimum number of restaurants,

  - which Neighbourhood is best for setting up new business,

  - how much competition is there in the neighborhood from other Indian Restaurants(this can be seen by viewing the rating).

DATA ACQUISITION AND CLEANING

- Data preparation includes: cleaning the data and getting the data to a stage where it may be easier to work with the data

- we will convert addresses into their equivalent latitude and longitude values and use Foursquare API to explore neighborhoods in New York City

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- Imported libraries are:
  - import numpy as np
  - import pandas as pd
  - from geopy.geocoders import Nominatim
  - import json
  - import requests
  - from pandas.io.json import json_normalize
  - import matplotlib.pyplot as plt
  - import matplotlib.cm as cm
  - import matplotlib.colors as colors
  - !conda install -c conda-forge folium=0.5.0 –yes (to install Folium)
  - import folium

- We can load the Neighborhoods latitude and longitude data from https://cocl.us/new_york_dataset which is a json file available on the server.

- We will use geopy library to get the latitude and longitude values of New York City

- Our prepared data will have:
  - latitudes and longitudes of all the neighborhoods
  - structured data ready in the form of a table having columns: Boroughs, Neighborhoods, Latitude, Longitude
  - Foursquare credentials i.e client_id and client_secret.
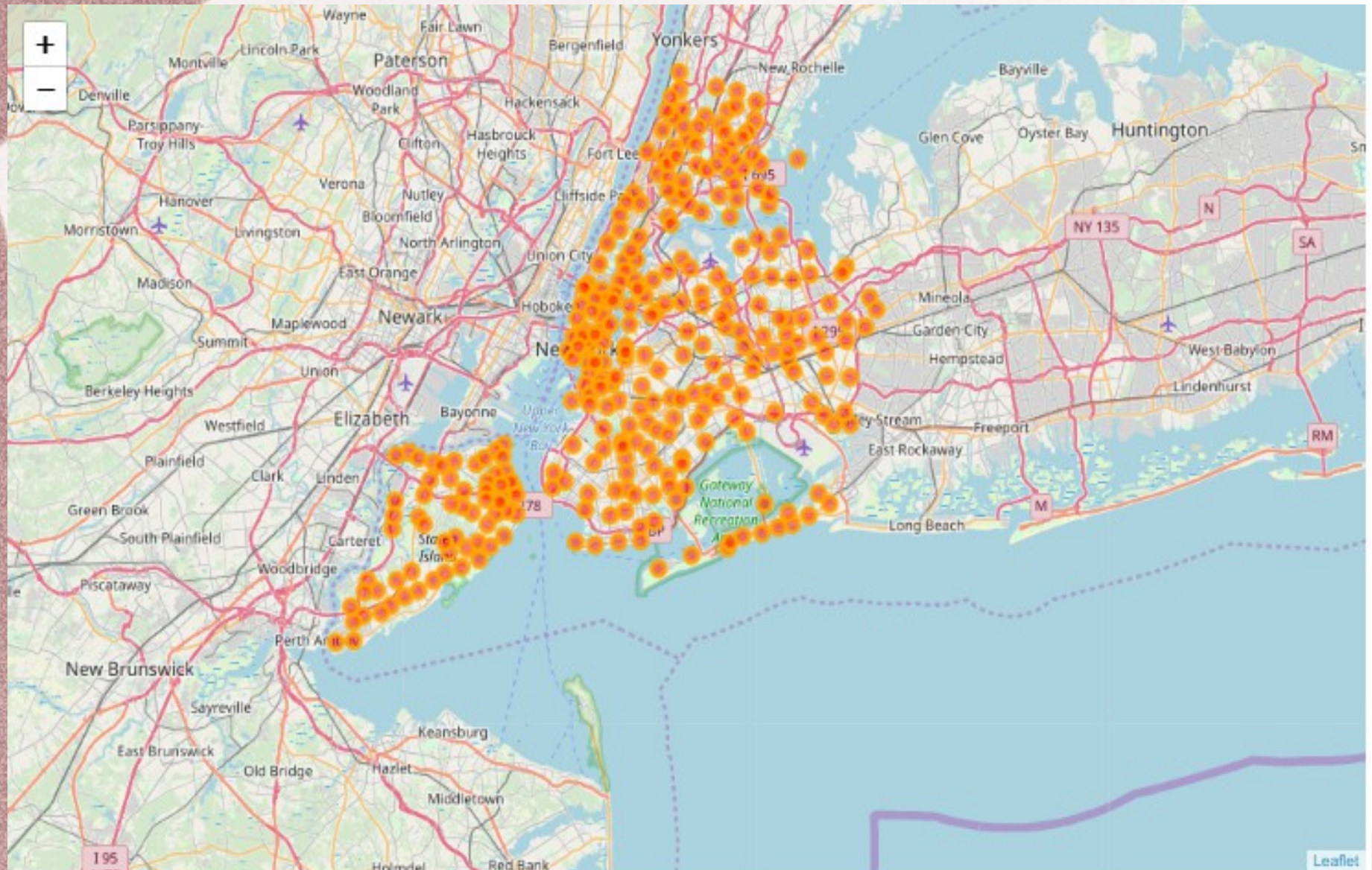   Foursquare credentials can be generated by creating a developer Foursquare account.

FEATURE SELECTION

- We can extract various features from our data using the Foursquare API like:

  - getting the venues(restaurants) within a specified radius.

  - filtering Indian restaurants within that radius.

  - getting venue details like tip count, likes count for a given venue id.

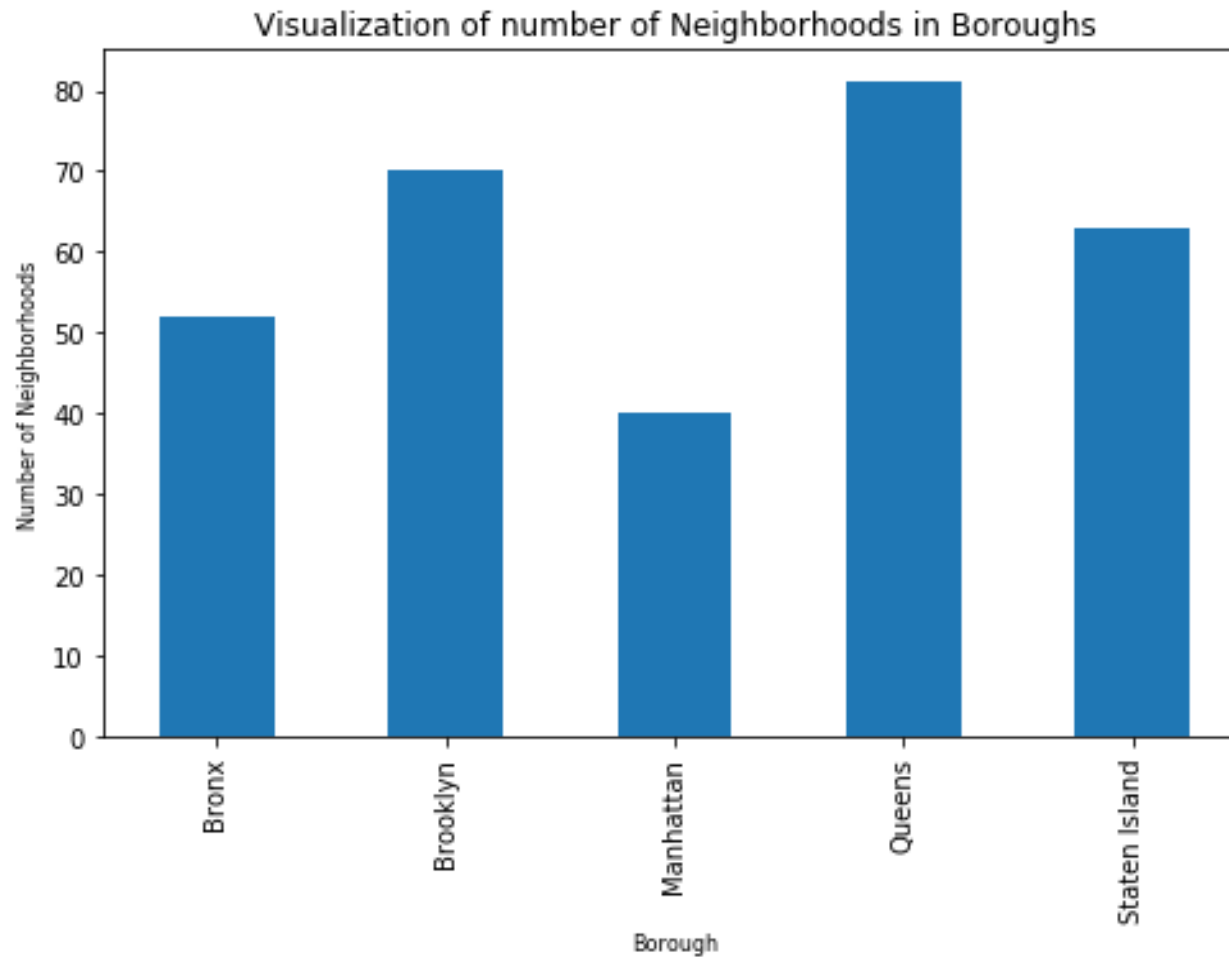 - finding the ratings of different Indian cuisine restaurants in an area.

METHODOLOGY

- Exploratory Data Analysis:

  – To understand our data we use exploratory data analysis to generate a map of New York city with neighborhoods superimposed on the top of the map.

  – We also plot Bar graphs to understand how our data is distributed.

  – We also use Foursquare API to extract various features of our data(like Ratings etc.)
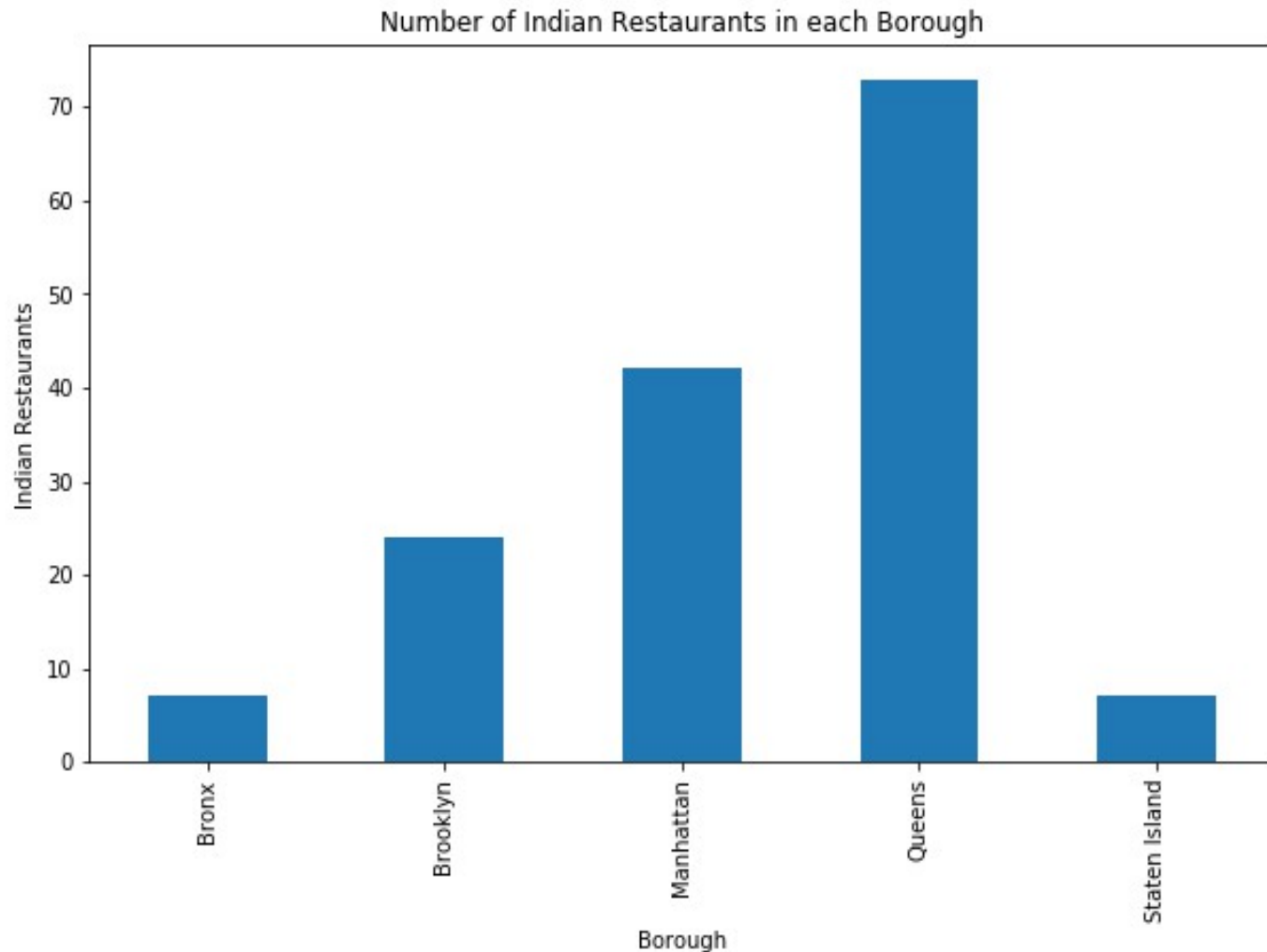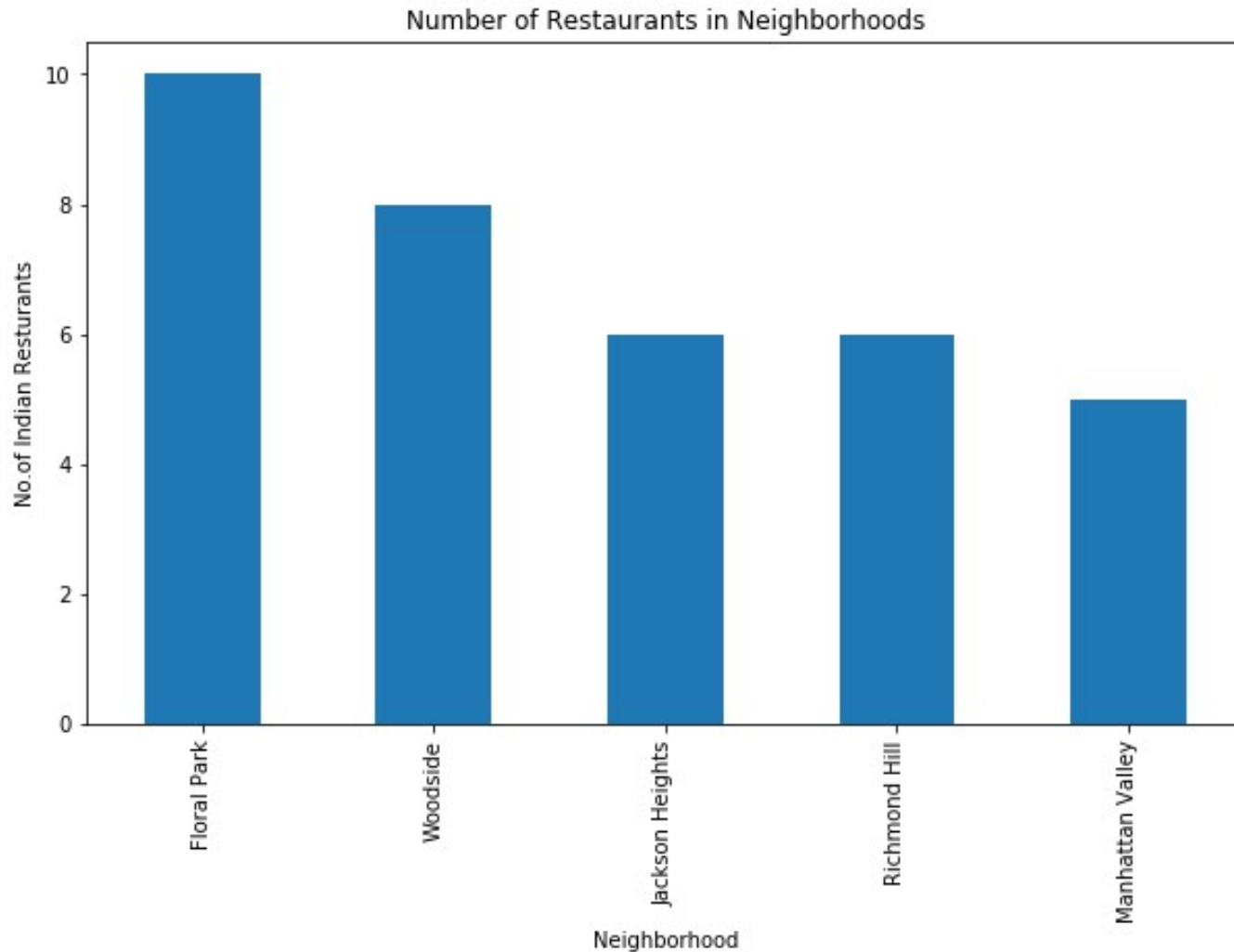
MAP OF NEW YORK SHOWING NEIGHBOURHOODS

Visualization of number of Neighborhoods in Boroughs

NUMBER OF INDIAN RESTAURANTS IN EACH BOROUGH

Number of Indian Restaurants in each Borough
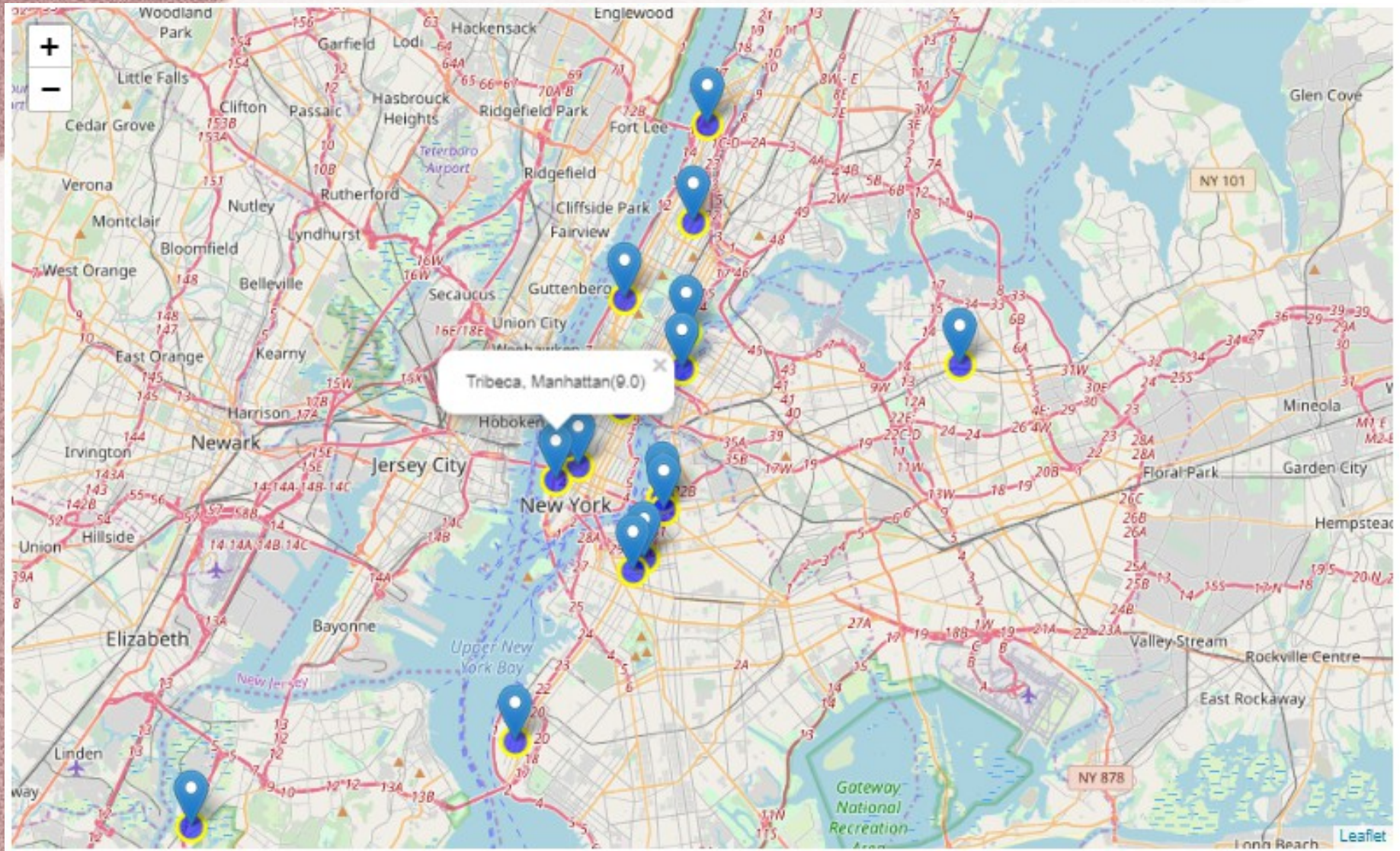
INDIAN RESTAURANTS IN NEIGHBORHOODS

RESULTS

- The results show the Average Restaurant Ratings of Indian food restaurants in a neighborhood. This provides the client an idea about
    - The competition in the restaurant market in the neighborhood
    - Which could be a potential neighborhood to start a new business
    - Which is a good neighborhood to stay if you like Indian cuisine

TABLE SHOWING AVERAGE RATING OF INDIAN FOOD RESTAURANTS

	Borough	Neighborhood	Latitude	Longitude	Average Rating
12	Manhattan	Tribeca	40.721522	-74.010683	9.000000
6	Manhattan	Greenwich Village	40.726933	-73.999914	8.900000
15	Manhattan	West Village	40.734434	-74.006180	8.850000
8	Queens	Murray Hill	40.764126	-73.812763	8.800000
7	Manhattan	Murray Hill	40.748303	-73.978332	8.800000
2	Manhattan	Chelsea	40.744035	-74.003116	8.700000
3	Staten Island	Chelsea	40.594726	-74.189560	8.700000
5	Brooklyn	Fort Greene	40.688527	-73.972906	8.700000
11	Brooklyn	South Side	40.710861	-73.958001	8.500000
9	Brooklyn	North Side	40.714823	-73.958809	8.500000
0	Brooklyn	Bay Ridge	40.625801	-74.030621	8.400000
10	Manhattan	Roosevelt Island	40.762160	-73.949168	8.300000
16	Manhattan	Yorkville	40.775930	-73.947118	8.250000
4	Brooklyn	Clinton Hill	40.693229	-73.967843	8.150000
13	Manhattan	Upper West Side	40.787658	-73.977059	8.133333
1	Manhattan	Central Harlem	40.815976	-73.943211	8.100000
14	Manhattan	Washington Heights	40.851903	-73.936900	8.000000

INDIAN RESTAURANTS WITH RATING > 8.0

DISCUSSIONS

- By looking at the Bar plots and Ratings we can conclude that:

  - Queens has the Maximum number of Indian Restaurants

  - Tribeca, Manhattan has the Highest Average Rating for Indian Restaurants.

  - Manhattan has some of the top rated Indian restaurants

  - Brooklyn also has many high rated Indian Restaurants

DISCUSSION (contd.)

- Manhattan and Brooklyn would be good neighborhoods to stay if you want to try Indian cuisine in New York.

- Tribeca, Manhattan Would be a Good choice to start a New Indian Restaurant.

- North and South Side in Brooklyn would also be good option as they have Rating ~ 8.5 which provides a less competitive market to open a new Business.

CONCLUSION

- The report visualizes all the neighborhoods in the city of New York on a Map and uses bar plots to show us:

    - which Borough has the highest number of neighborhoods

    - which Borough has the highest number of Indian restaurants

    - which neighborhoods have the most number of Indian restaurants

CONCLUSION(contd.)

- The report also :

  - sorts the Indian food restaurants according to their rating

  - visualizes the restaurants with rating higher than 8.0 on a map

- It provides insights about:

  - which neighborhood has the maximum number of Indian restaurants

  - which neighborhood is best to stay if you like Indian cuisine

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CONCLUSION (contd.)

- which neighborhoods have some of the highest rating restaurants in the city
- which are the potential neighborhoods to start a new Indian restaurant.