

Capstone Project - The Battle of Neighborhoods

Introduction

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. New York City is the most populous city in the United States, with an estimated 8,491,079 people living in the city, according to U.S. Census estimates dating July 1, 2014 (up from 8,175,133 in 2010; 8.0 million in 2000; and 7.3 million in 1990). This amounts to about 40% of New York State's population and a similar percentage of the metropolitan regional population. New York's two key demographic features are its population density and cultural diversity. The city's population density of 26,403 people per square mile (10,194/km²), makes it the densest of any American municipality with a population above 100,000. Manhattan's population density is 66,940 people per square mile (25,846/km²), highest of any county in the United States. New York City is multicultural. About 36% of the city's population is foreign-born, one of the highest among US cities. The eleven nations constituting the largest sources of modern immigration to New York City are the Dominican Republic, China, Jamaica, Guyana, Mexico, Ecuador, Brazil, Haiti, Trinidad and Tobago, Colombia, Russia and El Salvador. The New York City metropolitan area is home to the largest Jewish community outside Israel. It is also home to nearly a quarter of the nation's Indian Americans and 15% of all Korean Americans and the largest Asian Indian population in the Western Hemisphere; the largest African American community of any city in the country; and including 6 Chinatowns in the city proper, comprised as of 2008 a population of 659,596 overseas Chinese, the largest outside of Asia. New York City alone, according to the 2010 Census, has now become home to more than one million Asian Americans, greater than the combined totals of San Francisco and Los Angeles. New York contains the highest total Asian population of any U.S. city proper. 6.0% of New York City is of Chinese ethnicity, with about forty percent of them living in the borough of Queens alone. Koreans make up 1.2% of the city's population, and Japanese at 0.3%. Filipinos are the largest southeast Asian ethnic group at 0.8%, followed by Vietnamese who make up only 0.2% of New York City's population. Indians are the largest South Asian group, comprising 2.4% of the city's population, and Bangladeshis and Pakistanis at 0.7% and 0.5%, respectively.

With its diverse culture comes diverse food. There are many restaurants in New York belonging to different categories like Indian, Chinese, Thai etc So as part of this project, we will list and visualize all major parts of New York that has some good Indian restaurants.

Data

For this project we need the following data :

New York City data that contains list Boroughs, Neighborhoods along with their latitude and longitude...

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

GeoSpace data

- 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 visualize choropleth map.

Approach

- Collect the new york city data from https://cocl.us/new_york_dataset (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.
- Visualize the Ranking of neighborhoods using folium library(python)

Questions that can be asked using the above mentioned datasets

- 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 ?

Analysis

We will import the required libraries for python

- pandas and numpy for handling data
- request module for using FourSquare API
- geopy to get co-ordinates of City of New York
- folium to visualize the results on a map

In [3]:

```
import pandas as pd
import numpy as np
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)
import requests
from bs4 import BeautifulSoup
from geopy.geocoders import Nominatim
import os
!conda install -c conda-forge folium=0.5.0 --yes # uncomment this line if you haven't completed the Foursquare API lab
import folium # map rendering library
from geopy.geocoders import Nominatim # convert an address into Latitude and Longitude values
# Matplotlib and associated plotting modules
import matplotlib.pyplot as plt
import matplotlib.cm as cm
import matplotlib.colors as colors
%matplotlib inline

print('Libraries imported.')
```

Solving environment: done

Package Plan

environment location: /opt/conda/envs/Python36

added / updated specs:

- folium=0.5.0

The following packages will be downloaded:

package	build		
certifi-2019.9.11	py36_0	147 KB	conda-fo
ca-certificates-2019.9.11	hecc5488_0	144 KB	conda-fo
folium-0.5.0	py_0	45 KB	conda-fo
vincent-0.4.4	py_1	28 KB	conda-fo
branca-0.3.1	py_0	25 KB	conda-fo
openssl-1.1.1c	h516909a_0	2.1 MB	conda-fo
altair-3.2.0	py36_0	770 KB	conda-fo
Total:		3.3 MB	

The following NEW packages will be INSTALLED:

altair:	3.2.0-py36_0	conda-forge
branca:	0.3.1-py_0	conda-forge
folium:	0.5.0-py_0	conda-forge
vincent:	0.4.4-py_1	conda-forge

The following packages will be UPDATED:

ca-certificates:	2019.8.28-0	--> 2019.9.11-hecc5488_0
certifi:	2019.9.11-py36_0	--> 2019.9.11-py36_0

The following packages will be DOWNGRADED:

openssl:	1.1.1d-h7b6447c_2	--> 1.1.1c-h516909a_0
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Downloading and Extracting Packages

certifi-2019.9.11	147 KB	#####
100%		
ca-certificates-2019	144 KB	#####
100%		
folium-0.5.0	45 KB	#####
100%		
vincent-0.4.4	28 KB	#####
100%		
branca-0.3.1	25 KB	#####

```
100%
openssl-1.1.1c      | 2.1 MB | ##### |
100%
altair-3.2.0        | 770 KB | ##### |
100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
Libraries imported.
```

Now we define a function to get the geocodes i.e latitude and longitude of a given location using geopy.

In [6]:

```
def geo_location(address):
    # get geo location of address
    geolocator = Nominatim(user_agent="ny_explorer")
    location = geolocator.geocode(address)
    latitude = location.latitude
    longitude = location.longitude
    return latitude, longitude
```

We define a function to interact with FourSquare API and get top 100 venues within a radius of 1000 metres for a given latitude and longitude. Below function will return us the venue id , venue name and category.

In [46]:

```
def get_venues(lat,lng):

    #set variables
    radius=1000
    LIMIT=100
    CLIENT_ID = 'CLIENT_ID' # your Foursquare ID
    CLIENT_SECRET = 'CLIENT_SECRET' # your Foursquare Secret
    VERSION = '20180604' # Foursquare API version

    #url to fetch data from foursquare api
    url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&ll={},{}&radius={}&limit={}'.format(
        CLIENT_ID,
        CLIENT_SECRET,
        VERSION,
        lat,
        lng,
        radius,
        LIMIT)

    # get all the data
    results = requests.get(url).json()
    venue_data=results["response"]["groups"][0]["items"]
    venue_details=[]
    for row in venue_data:
        try:
            venue_id=row['venue']['id']
            venue_name=row['venue']['name']
            venue_category=row['venue']['categories'][0]['name']
            venue_details.append([venue_id,venue_name,venue_category])
        except KeyError:
            pass

    column_names=['ID','Name','Category']
    df = pd.DataFrame(venue_details,columns=column_names)
    return df
```

Now we will define a function to get venue details like like count , rating , tip counts for a given venue id. This will be used for ranking.

In [48]:

```
def get_venue_details(venue_id):

    CLIENT_ID = 'CLIENT_ID' # your Foursquare ID
    CLIENT_SECRET = 'CLIENT_SECRET' # your Foursquare Secret
    VERSION = '20180604' # Foursquare API version

    #url to fetch data from foursquare api
    url = 'https://api.foursquare.com/v2/venues/{id}?&client_id={}&client_secret={}&v={}'
    .format(
        venue_id,
        CLIENT_ID,
        CLIENT_SECRET,
        VERSION)

    # get all the data
    results = requests.get(url).json()
    venue_data=results['response']['venue']
    venue_details=[]
    try:
        venue_id=venue_data['id']
        venue_name=venue_data['name']
        venue_likes=venue_data['likes']['count']
        venue_rating=venue_data['rating']
        venue_tips=venue_data['tips']['count']
        venue_details.append([venue_id,venue_name,venue_likes,venue_rating,venue_tips])
    except KeyError:
        pass

    column_names=['ID','Name','Likes','Rating','Tips']
    df = pd.DataFrame(venue_details,columns=column_names)
    return df
```

Now we define a function to get the new york city data such as Boroughs, Neighborhoods along with their latitude and longitude.

In [49]:

```
def get_new_york_data():
    url='https://cocl.us/new_york_dataset'
    resp=requests.get(url).json()
    # all data is present in features label
    features=resp['features']

    # define the dataframe columns
    column_names = ['Borough', 'Neighborhood', 'Latitude', 'Longitude']
    # instantiate the dataframe
    new_york_data = pd.DataFrame(columns=column_names)

    for data in features:
        borough = data['properties']['borough']
        neighborhood_name = data['properties']['name']

        neighborhood_latlon = data['geometry']['coordinates']
        neighborhood_lat = neighborhood_latlon[1]
        neighborhood_lon = neighborhood_latlon[0]

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

    return new_york_data
```

We will call the above function to get the new york city data

In [50]:

```
# get new york data
new_york_data=get_new_york_data()
```

In [51]:

```
new_york_data.head()
```

Out[51]:

	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 [21]:

```
new_york_data.shape
```

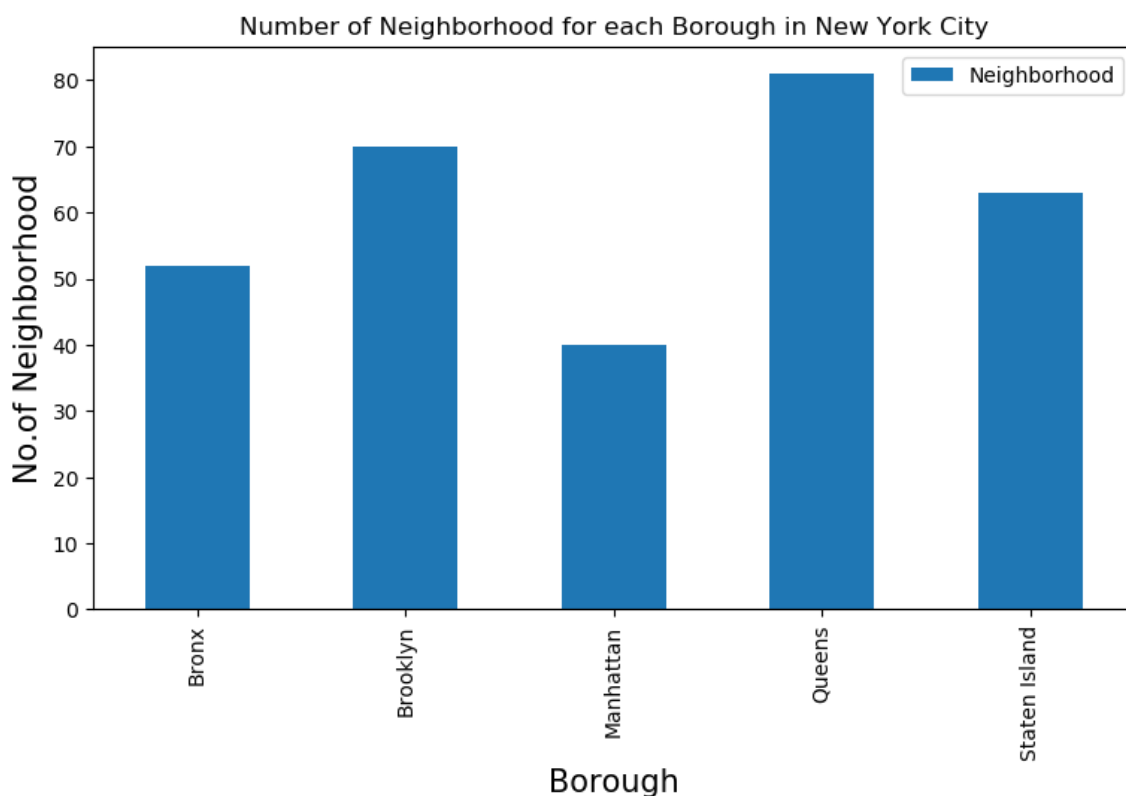
Out[21]:

(306, 4)

So there are total of 306 different Neighborhoods in New York

In [29]:

```
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('Number of Neighborhood for each Borough in New York City')
#On x-axis
plt.xlabel('Borough', fontsize = 15)
#On y-axis
plt.ylabel('No.of Neighborhood', fontsize=15)
#giving a bar plot
new_york_data.groupby('Borough')['Neighborhood'].count().plot(kind='bar')
#legend
plt.legend()
#displays the plot
plt.show()
```



We see that Queens has highest number of neighborhoods

Now we will collect Indian restaurants for each Neighborhood

In [30]:

```
# prepare neighborhood list that contains indian resturants
column_names=['Borough', 'Neighborhood', 'ID', 'Name']
indian_rest_ny=pd.DataFrame(columns=column_names)
count=1
for row in new_york_data.values.tolist():
    Borough, Neighborhood, Latitude, Longitude=row
    venues = get_venues(Latitude,Longitude)
    indian_restaurants=venues[venues['Category']=='Indian Restaurant']
    print('(',count,'/',len(new_york_data),')','Indian Restaurants in '+Neighborhood+',
'+Borough+':'+str(len(indian_restaurants)))
    for restaurant_detail in indian_restaurants.values.tolist():
        id, name , category=restaurant_detail
        indian_rest_ny = indian_rest_ny.append({'Borough': Borough,
                                                'Neighborhood': Neighborhood,
                                                'ID': id,
                                                'Name' : name
                                                }, ignore_index=True)

count+=1
```

(1 / 306) Indian Resturants in Wakefield, Bronx:0
(2 / 306) Indian Resturants in Co-op City, Bronx:0
(3 / 306) Indian Resturants in Eastchester, Bronx:0
(4 / 306) Indian Resturants in Fieldston, Bronx:0
(5 / 306) Indian Resturants in Riverdale, Bronx:1
(6 / 306) Indian Resturants in Kingsbridge, Bronx:1
(7 / 306) Indian Resturants in Marble Hill, Manhattan:0
(8 / 306) Indian Resturants in Woodlawn, Bronx:1
(9 / 306) Indian Resturants in Norwood, Bronx:0
(10 / 306) Indian Resturants in Williamsbridge, Bronx:0
(11 / 306) Indian Resturants in Baychester, Bronx:0
(12 / 306) Indian Resturants in Pelham Parkway, Bronx:0
(13 / 306) Indian Resturants in City Island, Bronx:0
(14 / 306) Indian Resturants in Bedford Park, Bronx:0
(15 / 306) Indian Resturants in University Heights, Bronx:0
(16 / 306) Indian Resturants in Morris Heights, Bronx:0
(17 / 306) Indian Resturants in Fordham, Bronx:0
(18 / 306) Indian Resturants in East Tremont, Bronx:0
(19 / 306) Indian Resturants in West Farms, Bronx:0
(20 / 306) Indian Resturants in High Bridge, Bronx:0
(21 / 306) Indian Resturants in Melrose, Bronx:0
(22 / 306) Indian Resturants in Mott Haven, Bronx:0
(23 / 306) Indian Resturants in Port Morris, Bronx:0
(24 / 306) Indian Resturants in Longwood, Bronx:0
(25 / 306) Indian Resturants in Hunts Point, Bronx:0
(26 / 306) Indian Resturants in Morrisania, Bronx:0
(27 / 306) Indian Resturants in Soundview, Bronx:0
(28 / 306) Indian Resturants in Clason Point, Bronx:0
(29 / 306) Indian Resturants in Throgs Neck, Bronx:0
(30 / 306) Indian Resturants in Country Club, Bronx:0
(31 / 306) Indian Resturants in Parkchester, Bronx:1
(32 / 306) Indian Resturants in Westchester Square, Bronx:0
(33 / 306) Indian Resturants in Van Nest, Bronx:0
(34 / 306) Indian Resturants in Morris Park, Bronx:0
(35 / 306) Indian Resturants in Belmont, Bronx:0
(36 / 306) Indian Resturants in Spuyten Duyvil, Bronx:1
(37 / 306) Indian Resturants in North Riverdale, Bronx:0
(38 / 306) Indian Resturants in Pelham Bay, Bronx:0
(39 / 306) Indian Resturants in Schuylerville, Bronx:0
(40 / 306) Indian Resturants in Edgewater Park, Bronx:0
(41 / 306) Indian Resturants in Castle Hill, Bronx:0
(42 / 306) Indian Resturants in Olinville, Bronx:0
(43 / 306) Indian Resturants in Pelham Gardens, Bronx:0
(44 / 306) Indian Resturants in Concourse, Bronx:1
(45 / 306) Indian Resturants in Unionport, Bronx:1
(46 / 306) Indian Resturants in Edenwald, Bronx:0
(47 / 306) Indian Resturants in Bay Ridge, Brooklyn:2
(48 / 306) Indian Resturants in Bensonhurst, Brooklyn:0
(49 / 306) Indian Resturants in Sunset Park, Brooklyn:0
(50 / 306) Indian Resturants in Greenpoint, Brooklyn:0
(51 / 306) Indian Resturants in Gravesend, Brooklyn:0
(52 / 306) Indian Resturants in Brighton Beach, Brooklyn:1
(53 / 306) Indian Resturants in Sheepshead Bay, Brooklyn:0
(54 / 306) Indian Resturants in Manhattan Terrace, Brooklyn:0
(55 / 306) Indian Resturants in Flatbush, Brooklyn:2
(56 / 306) Indian Resturants in Crown Heights, Brooklyn:0
(57 / 306) Indian Resturants in East Flatbush, Brooklyn:1
(58 / 306) Indian Resturants in Kensington, Brooklyn:2
(59 / 306) Indian Resturants in Windsor Terrace, Brooklyn:0
(60 / 306) Indian Resturants in Prospect Heights, Brooklyn:0
(61 / 306) Indian Resturants in Brownsville, Brooklyn:0

(62 / 306) Indian Resturants in Williamsburg, Brooklyn:0
(63 / 306) Indian Resturants in Bushwick, Brooklyn:0
(64 / 306) Indian Resturants in Bedford Stuyvesant, Brooklyn:0
(65 / 306) Indian Resturants in Brooklyn Heights, Brooklyn:0
(66 / 306) Indian Resturants in Cobble Hill, Brooklyn:0
(67 / 306) Indian Resturants in Carroll Gardens, Brooklyn:0
(68 / 306) Indian Resturants in Red Hook, Brooklyn:0
(69 / 306) Indian Resturants in Gowanus, Brooklyn:1
(70 / 306) Indian Resturants in Fort Greene, Brooklyn:1
(71 / 306) Indian Resturants in Park Slope, Brooklyn:0
(72 / 306) Indian Resturants in Cypress Hills, Brooklyn:0
(73 / 306) Indian Resturants in East New York, Brooklyn:0
(74 / 306) Indian Resturants in Starrett City, Brooklyn:0
(75 / 306) Indian Resturants in Canarsie, Brooklyn:0
(76 / 306) Indian Resturants in Flatlands, Brooklyn:0
(77 / 306) Indian Resturants in Mill Island, Brooklyn:0
(78 / 306) Indian Resturants in Manhattan Beach, Brooklyn:0
(79 / 306) Indian Resturants in Coney Island, Brooklyn:0
(80 / 306) Indian Resturants in Bath Beach, Brooklyn:0
(81 / 306) Indian Resturants in Borough Park, Brooklyn:0
(82 / 306) Indian Resturants in Dyker Heights, Brooklyn:0
(83 / 306) Indian Resturants in Gerritsen Beach, Brooklyn:0
(84 / 306) Indian Resturants in Marine Park, Brooklyn:0
(85 / 306) Indian Resturants in Clinton Hill, Brooklyn:2
(86 / 306) Indian Resturants in Sea Gate, Brooklyn:0
(87 / 306) Indian Resturants in Downtown, Brooklyn:0
(88 / 306) Indian Resturants in Boerum Hill, Brooklyn:0
(89 / 306) Indian Resturants in Prospect Lefferts Gardens, Brooklyn:3
(90 / 306) Indian Resturants in Ocean Hill, Brooklyn:2
(91 / 306) Indian Resturants in City Line, Brooklyn:0
(92 / 306) Indian Resturants in Bergen Beach, Brooklyn:0
(93 / 306) Indian Resturants in Midwood, Brooklyn:0
(94 / 306) Indian Resturants in Prospect Park South, Brooklyn:3
(95 / 306) Indian Resturants in Georgetown, Brooklyn:0
(96 / 306) Indian Resturants in East Williamsburg, Brooklyn:0
(97 / 306) Indian Resturants in North Side, Brooklyn:1
(98 / 306) Indian Resturants in South Side, Brooklyn:1
(99 / 306) Indian Resturants in Ocean Parkway, Brooklyn:0
(100 / 306) Indian Resturants in Fort Hamilton, Brooklyn:1
(101 / 306) Indian Resturants in Chinatown, Manhattan:0
(102 / 306) Indian Resturants in Washington Heights, Manhattan:1
(103 / 306) Indian Resturants in Inwood, Manhattan:0
(104 / 306) Indian Resturants in Hamilton Heights, Manhattan:2
(105 / 306) Indian Resturants in Manhattanville, Manhattan:2
(106 / 306) Indian Resturants in Central Harlem, Manhattan:2
(107 / 306) Indian Resturants in East Harlem, Manhattan:1
(108 / 306) Indian Resturants in Upper East Side, Manhattan:0
(109 / 306) Indian Resturants in Yorkville, Manhattan:1
(110 / 306) Indian Resturants in Lenox Hill, Manhattan:0
(111 / 306) Indian Resturants in Roosevelt Island, Manhattan:1
(112 / 306) Indian Resturants in Upper West Side, Manhattan:2
(113 / 306) Indian Resturants in Lincoln Square, Manhattan:0
(114 / 306) Indian Resturants in Clinton, Manhattan:0
(115 / 306) Indian Resturants in Midtown, Manhattan:1
(116 / 306) Indian Resturants in Murray Hill, Manhattan:1
(117 / 306) Indian Resturants in Chelsea, Manhattan:1
(118 / 306) Indian Resturants in Greenwich Village, Manhattan:1
(119 / 306) Indian Resturants in East Village, Manhattan:0
(120 / 306) Indian Resturants in Lower East Side, Manhattan:0
(121 / 306) Indian Resturants in Tribeca, Manhattan:1
(122 / 306) Indian Resturants in Little Italy, Manhattan:0

(123 / 306) Indian Resturants in Soho, Manhattan:0
(124 / 306) Indian Resturants in West Village, Manhattan:2
(125 / 306) Indian Resturants in Manhattan Valley, Manhattan:5
(126 / 306) Indian Resturants in Morningside Heights, Manhattan:2
(127 / 306) Indian Resturants in Gramercy, Manhattan:4
(128 / 306) Indian Resturants in Battery Park City, Manhattan:0
(129 / 306) Indian Resturants in Financial District, Manhattan:1
(130 / 306) Indian Resturants in Astoria, Queens:1
(131 / 306) Indian Resturants in Woodside, Queens:6
(132 / 306) Indian Resturants in Jackson Heights, Queens:4
(133 / 306) Indian Resturants in Elmhurst, Queens:1
(134 / 306) Indian Resturants in Howard Beach, Queens:0
(135 / 306) Indian Resturants in Corona, Queens:0
(136 / 306) Indian Resturants in Forest Hills, Queens:0
(137 / 306) Indian Resturants in Kew Gardens, Queens:2
(138 / 306) Indian Resturants in Richmond Hill, Queens:6
(139 / 306) Indian Resturants in Flushing, Queens:0
(140 / 306) Indian Resturants in Long Island City, Queens:3
(141 / 306) Indian Resturants in Sunnyside, Queens:1
(142 / 306) Indian Resturants in East Elmhurst, Queens:0
(143 / 306) Indian Resturants in Maspeth, Queens:0
(144 / 306) Indian Resturants in Ridgewood, Queens:1
(145 / 306) Indian Resturants in Glendale, Queens:0
(146 / 306) Indian Resturants in Rego Park, Queens:1
(147 / 306) Indian Resturants in Woodhaven, Queens:0
(148 / 306) Indian Resturants in Ozone Park, Queens:0
(149 / 306) Indian Resturants in South Ozone Park, Queens:1
(150 / 306) Indian Resturants in College Point, Queens:0
(151 / 306) Indian Resturants in Whitestone, Queens:0
(152 / 306) Indian Resturants in Bayside, Queens:3
(153 / 306) Indian Resturants in Auburndale, Queens:0
(154 / 306) Indian Resturants in Little Neck, Queens:0
(155 / 306) Indian Resturants in Douglaston, Queens:0
(156 / 306) Indian Resturants in Glen Oaks, Queens:4
(157 / 306) Indian Resturants in Bellerose, Queens:1
(158 / 306) Indian Resturants in Kew Gardens Hills, Queens:0
(159 / 306) Indian Resturants in Fresh Meadows, Queens:0
(160 / 306) Indian Resturants in Briarwood, Queens:3
(161 / 306) Indian Resturants in Jamaica Center, Queens:4
(162 / 306) Indian Resturants in Oakland Gardens, Queens:0
(163 / 306) Indian Resturants in Queens Village, Queens:0
(164 / 306) Indian Resturants in Hollis, Queens:0
(165 / 306) Indian Resturants in South Jamaica, Queens:0
(166 / 306) Indian Resturants in St. Albans, Queens:0
(167 / 306) Indian Resturants in Rochdale, Queens:0
(168 / 306) Indian Resturants in Springfield Gardens, Queens:0
(169 / 306) Indian Resturants in Cambria Heights, Queens:0
(170 / 306) Indian Resturants in Rosedale, Queens:0
(171 / 306) Indian Resturants in Far Rockaway, Queens:0
(172 / 306) Indian Resturants in Broad Channel, Queens:0
(173 / 306) Indian Resturants in Breezy Point, Queens:0
(174 / 306) Indian Resturants in Steinway, Queens:1
(175 / 306) Indian Resturants in Beechhurst, Queens:0
(176 / 306) Indian Resturants in Bay Terrace, Queens:0
(177 / 306) Indian Resturants in Edgemere, Queens:0
(178 / 306) Indian Resturants in Arverne, Queens:0
(179 / 306) Indian Resturants in Rockaway Beach, Queens:0
(180 / 306) Indian Resturants in Neponsit, Queens:0
(181 / 306) Indian Resturants in Murray Hill, Queens:0
(182 / 306) Indian Resturants in Floral Park, Queens:11
(183 / 306) Indian Resturants in Holliswood, Queens:1

(184 / 306) Indian Resturants in Jamaica Estates, Queens:3
(185 / 306) Indian Resturants in Queensboro Hill, Queens:0
(186 / 306) Indian Resturants in Hillcrest, Queens:0
(187 / 306) Indian Resturants in Ravenswood, Queens:1
(188 / 306) Indian Resturants in Lindenwood, Queens:0
(189 / 306) Indian Resturants in Laurelton, Queens:0
(190 / 306) Indian Resturants in Lefrak City, Queens:0
(191 / 306) Indian Resturants in Belle Harbor, Queens:0
(192 / 306) Indian Resturants in Rockaway Park, Queens:0
(193 / 306) Indian Resturants in Somerville, Queens:0
(194 / 306) Indian Resturants in Brookville, Queens:0
(195 / 306) Indian Resturants in Bellaire, Queens:1
(196 / 306) Indian Resturants in North Corona, Queens:0
(197 / 306) Indian Resturants in Forest Hills Gardens, Queens:0
(198 / 306) Indian Resturants in St. George, Staten Island:0
(199 / 306) Indian Resturants in New Brighton, Staten Island:1
(200 / 306) Indian Resturants in Stapleton, Staten Island:0
(201 / 306) Indian Resturants in Rosebank, Staten Island:0
(202 / 306) Indian Resturants in West Brighton, Staten Island:0
(203 / 306) Indian Resturants in Grymes Hill, Staten Island:0
(204 / 306) Indian Resturants in Todt Hill, Staten Island:0
(205 / 306) Indian Resturants in South Beach, Staten Island:0
(206 / 306) Indian Resturants in Port Richmond, Staten Island:0
(207 / 306) Indian Resturants in Mariner's Harbor, Staten Island:0
(208 / 306) Indian Resturants in Port Ivory, Staten Island:0
(209 / 306) Indian Resturants in Castleton Corners, Staten Island:0
(210 / 306) Indian Resturants in New Springville, Staten Island:0
(211 / 306) Indian Resturants in Travis, Staten Island:0
(212 / 306) Indian Resturants in New Dorp, Staten Island:1
(213 / 306) Indian Resturants in Oakwood, Staten Island:0
(214 / 306) Indian Resturants in Great Kills, Staten Island:0
(215 / 306) Indian Resturants in Eltingville, Staten Island:0
(216 / 306) Indian Resturants in Annadale, Staten Island:0
(217 / 306) Indian Resturants in Woodrow, Staten Island:0
(218 / 306) Indian Resturants in Tottenville, Staten Island:0
(219 / 306) Indian Resturants in Tompkinsville, Staten Island:1
(220 / 306) Indian Resturants in Silver Lake, Staten Island:0
(221 / 306) Indian Resturants in Sunnyside, Staten Island:0
(222 / 306) Indian Resturants in Ditmas Park, Brooklyn:4
(223 / 306) Indian Resturants in Wingate, Brooklyn:0
(224 / 306) Indian Resturants in Rugby, Brooklyn:0
(225 / 306) Indian Resturants in Park Hill, Staten Island:0
(226 / 306) Indian Resturants in Westerleigh, Staten Island:0
(227 / 306) Indian Resturants in Graniteville, Staten Island:0
(228 / 306) Indian Resturants in Arlington, Staten Island:0
(229 / 306) Indian Resturants in Arrochar, Staten Island:0
(230 / 306) Indian Resturants in Grasmere, Staten Island:0
(231 / 306) Indian Resturants in Old Town, Staten Island:0
(232 / 306) Indian Resturants in Dongan Hills, Staten Island:0
(233 / 306) Indian Resturants in Midland Beach, Staten Island:0
(234 / 306) Indian Resturants in Grant City, Staten Island:2
(235 / 306) Indian Resturants in New Dorp Beach, Staten Island:0
(236 / 306) Indian Resturants in Bay Terrace, Staten Island:0
(237 / 306) Indian Resturants in Huguenot, Staten Island:0
(238 / 306) Indian Resturants in Pleasant Plains, Staten Island:0
(239 / 306) Indian Resturants in Butler Manor, Staten Island:0
(240 / 306) Indian Resturants in Charleston, Staten Island:0
(241 / 306) Indian Resturants in Rossville, Staten Island:0
(242 / 306) Indian Resturants in Arden Heights, Staten Island:0
(243 / 306) Indian Resturants in Greenridge, Staten Island:0
(244 / 306) Indian Resturants in Heartland Village, Staten Island:0

(245 / 306) Indian Resturants in Chelsea, Staten Island:0
(246 / 306) Indian Resturants in Bloomfield, Staten Island:0
(247 / 306) Indian Resturants in Bulls Head, Staten Island:0
(248 / 306) Indian Resturants in Carnegie Hill, Manhattan:3
(249 / 306) Indian Resturants in Noho, Manhattan:0
(250 / 306) Indian Resturants in Civic Center, Manhattan:1
(251 / 306) Indian Resturants in Midtown South, Manhattan:1
(252 / 306) Indian Resturants in Richmond Town, Staten Island:0
(253 / 306) Indian Resturants in Shore Acres, Staten Island:0
(254 / 306) Indian Resturants in Clifton, Staten Island:0
(255 / 306) Indian Resturants in Concord, Staten Island:0
(256 / 306) Indian Resturants in Emerson Hill, Staten Island:0
(257 / 306) Indian Resturants in Randall Manor, Staten Island:0
(258 / 306) Indian Resturants in Howland Hook, Staten Island:0
(259 / 306) Indian Resturants in Elm Park, Staten Island:0
(260 / 306) Indian Resturants in Remsen Village, Brooklyn:0
(261 / 306) Indian Resturants in New Lots, Brooklyn:0
(262 / 306) Indian Resturants in Paerdegat Basin, Brooklyn:0
(263 / 306) Indian Resturants in Mill Basin, Brooklyn:0
(264 / 306) Indian Resturants in Jamaica Hills, Queens:4
(265 / 306) Indian Resturants in Utopia, Queens:0
(266 / 306) Indian Resturants in Pomonok, Queens:0
(267 / 306) Indian Resturants in Astoria Heights, Queens:0
(268 / 306) Indian Resturants in Claremont Village, Bronx:0
(269 / 306) Indian Resturants in Concourse Village, Bronx:1
(270 / 306) Indian Resturants in Mount Eden, Bronx:0
(271 / 306) Indian Resturants in Mount Hope, Bronx:0
(272 / 306) Indian Resturants in Sutton Place, Manhattan:3
(273 / 306) Indian Resturants in Hunters Point, Queens:0
(274 / 306) Indian Resturants in Turtle Bay, Manhattan:3
(275 / 306) Indian Resturants in Tudor City, Manhattan:2
(276 / 306) Indian Resturants in Stuyvesant Town, Manhattan:0
(277 / 306) Indian Resturants in Flatiron, Manhattan:0
(278 / 306) Indian Resturants in Sunnyside Gardens, Queens:1
(279 / 306) Indian Resturants in Blissville, Queens:1
(280 / 306) Indian Resturants in Fulton Ferry, Brooklyn:0
(281 / 306) Indian Resturants in Vinegar Hill, Brooklyn:0
(282 / 306) Indian Resturants in Weeksville, Brooklyn:0
(283 / 306) Indian Resturants in Broadway Junction, Brooklyn:0
(284 / 306) Indian Resturants in Dumbo, Brooklyn:0
(285 / 306) Indian Resturants in Manor Heights, Staten Island:0
(286 / 306) Indian Resturants in Willowbrook, Staten Island:0
(287 / 306) Indian Resturants in Sandy Ground, Staten Island:0
(288 / 306) Indian Resturants in Egbertville, Staten Island:0
(289 / 306) Indian Resturants in Roxbury, Queens:0
(290 / 306) Indian Resturants in Homecrest, Brooklyn:0
(291 / 306) Indian Resturants in Middle Village, Queens:0
(292 / 306) Indian Resturants in Prince's Bay, Staten Island:0
(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:0
```

Now that we have got all the indian resturants in new york city , we will analyze it

In [31]:

```
indian_rest_ny.head()
```

Out[31]:

	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

In [32]:

```
indian_rest_ny.shape
```

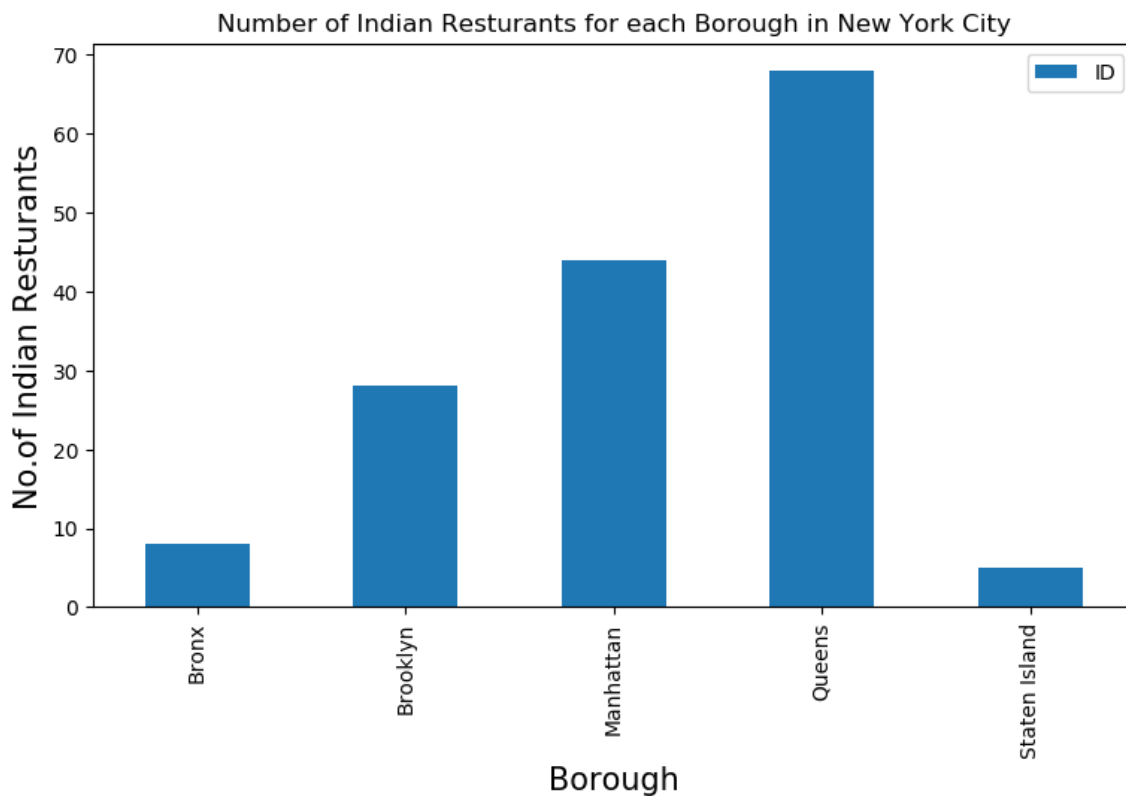
Out[32]:

```
(153, 4)
```

We got 153 Indian Resturants across New York City

In [33]:

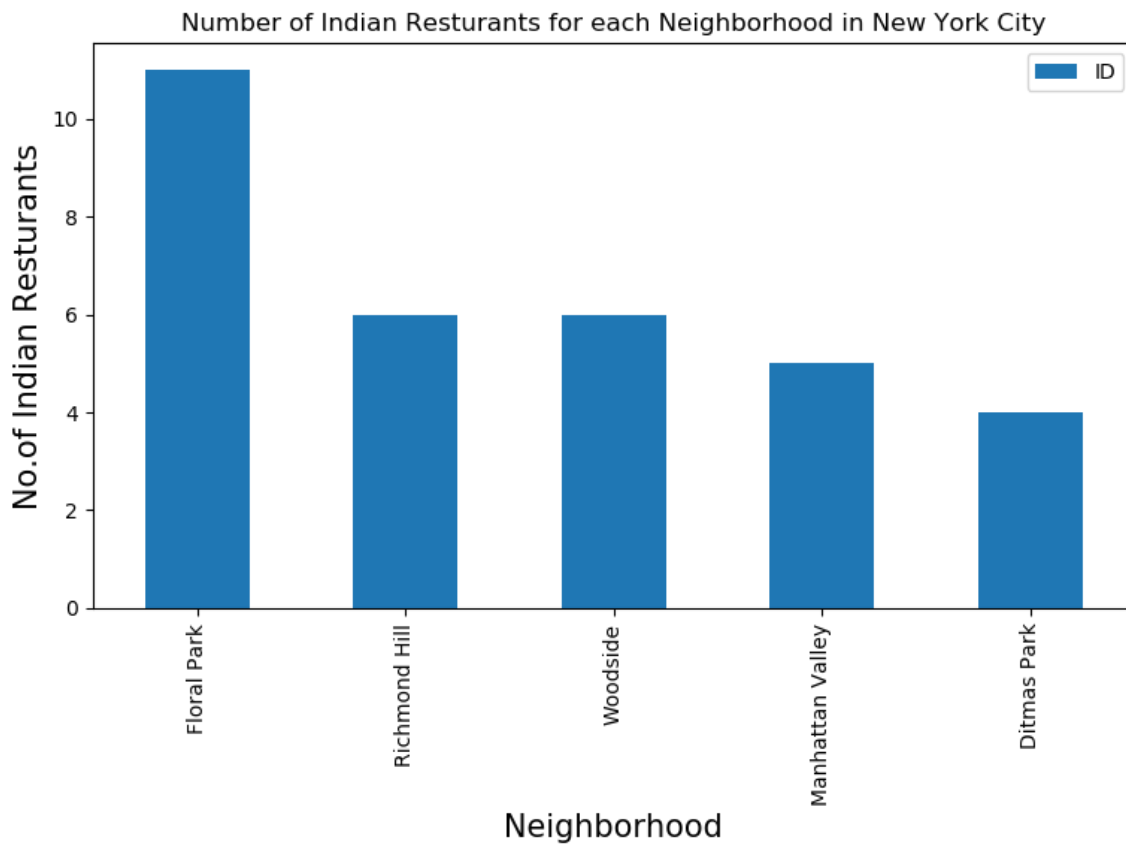
```
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('Number of Indian Resturants for each Borough in New York City')
#On x-axis
plt.xlabel('Borough', fontsize = 15)
#On y-axis
plt.ylabel('No.of Indian Resturants', fontsize=15)
#giving a bar plot
indian_rest_ny.groupby('Borough')['ID'].count().plot(kind='bar')
#legend
plt.legend()
#displays the plot
plt.show()
```



We see that Queens has the largest number of indian resturants

In [34]:

```
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('Number of Indian Resturants for each Neighborhood in New York City')
#On x-axis
plt.xlabel('Neighborhood', fontsize = 15)
#On y-axis
plt.ylabel('No.of Indian Resturants', fontsize=15)
#giving a bar plot
indian_rest_ny.groupby('Neighborhood')['ID'].count().nlargest(5).plot(kind='bar')
#legend
plt.legend()
#displays the plot
plt.show()
```



In [52]:

```
indian_rest_ny[indian_rest_ny['Neighborhood']=='Floral Park']
```

Out[52]:

	Borough	Neighborhood	ID	Name
104	Queens	Floral Park	527ffc0811d2d329d5e49abd	Jackson Diner
105	Queens	Floral Park	4e4e3e22bd4101d0d7a5c2d1	Kerala Kitchen
106	Queens	Floral Park	4b647b56f964a520c4b62ae3	Usha Foods & Usha Sweets
107	Queens	Floral Park	4b787c49f964a5209cd12ee3	Santoor Indian Restaurant
108	Queens	Floral Park	4c0c01e0bbc676b00d6b4cd5	Mumbai Xpress
109	Queens	Floral Park	4c76ff35a5676dcb72671721	Flavor Of India
110	Queens	Floral Park	571af96a498e9e392d8d3786	Namaste Authenic Indian Cuisine
111	Queens	Floral Park	55d68c1b498ecf05fa196fe1	Namaste Restaurant and Cafe
112	Queens	Floral Park	4ec1b54f4690d2338a359d66	Tabaq Kebab Grill
113	Queens	Floral Park	4df0f39dd4c04d0392c853ea	Sagar Chinese
114	Queens	Floral Park	4e6bfe1c7d8b2c711b17bbe5	Surya sweets and snacks

So Floral Park in Queens has the highest number of Indian Resturants with a total count of 9.

Now we will get the ranking of each resturant for further analysis.

In [53]:

```
# prepare neighborhood list that contains indian resturants
column_names=['Borough', 'Neighborhood', 'ID', 'Name', 'Likes', 'Rating', 'Tips']
indian_rest_stats_ny=pd.DataFrame(columns=column_names)
count=1

for row in indian_rest_ny.values.tolist():
    Borough,Neighborhood,ID,Name=row
    try:
        venue_details=get_venue_details(ID)
        print(venue_details)
        id,name,likes,rating,tips=venue_details.values.tolist()[0]
    except IndexError:
        print('No data available for id=',ID)
        # we will assign 0 value for these resturants as they may have been
        #recently opened or details does not exist in FourSquare Database
        id,name,likes,rating,tips=[0]*5
    print('(',count,',',len(indian_rest_ny),')', 'processed')
    indian_rest_stats_ny = indian_rest_stats_ny.append({'Borough': Borough,
                                                         'Neighborhood': Neighborhood,
                                                         'ID': id,
                                                         'Name' : name,
                                                         'Likes' : likes,
                                                         'Rating' : rating,
                                                         'Tips' : tips
                                                         }, ignore_index=True)

    count+=1
```

	ID	Name	Likes	Rating	Tips
0	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9

(1 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9

(2 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4c0448d9310fc9b6bf1dc761	Curry Spot	5	7.8	11

(3 / 153) processed

	ID	Name	Likes	Rating	T
ips					
0	4c194631838020a13e78e561	Melanies Roti Bar And Grill		3	5.9

2
(4 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9

(5 / 153) processed

	ID	Name	Likes	Rating	Tips
0	551b7f75498e86c00a0ed2e1	Hungry Bird	8	6.9	3

(6 / 153) processed

	ID	Name	Likes	Rating	T
ips					
0	4c194631838020a13e78e561	Melanies Roti Bar And Grill		3	5.9

2
(7 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4b5a4dc8f964a520a2bb28e3	Taj Mahal	38	8.4	26

(8 / 153) processed

	ID	Name	Likes	Rating	Tips
0	545835a1498e820edc6f636f	Bombay Grill	14	7.1	4

(9 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4af0d31bf964a5207ddf21e3	Pak Nasheman	9	7.2	4

(10 / 153) processed

	ID	Name	Likes	Rating	Tips
0	52213c4211d295d4c57a607c	Ashoka Grill	8	7.3	14

(11 / 153) processed

	ID	Name	Likes	Rating	Tips
0	564d283d498e6e851df79d87	Great Indian Curry	3	6.8	2

(12 / 153) processed

	ID	Name	Likes	Rating	Tips
0	512a9ea9e4b004fb8eeb84e5	Silver Krust	12	8.2	3

(13 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4db0f4371e729fcc56497f20	Mashallah	19	7.6	7

(14 / 153) processed

	ID	Name	Likes	Rating	
Tips					
0	4b718914f964a520c04b2de3	Madina Restaurant and Sweets	17	7.0	

12
(15 / 153) processed

	ID	Name	Likes	Rating	Tip
s					
0	52f18573498ec2c34e830ffd	Kanan's Indian Restaurant	23	7.6	

8
(16 / 153) processed

	ID	Name	Likes	Rating	Tips
0	57596dad498e732300496b23	Dosa Royale	74	8.8	22

(17 / 153) processed

	ID	Name	Likes	Rating	Tips
0	57596dad498e732300496b23	Dosa Royale	74	8.8	22

(18 / 153) processed

ID	Name	Likes	Rating	Tips
0 568d3902498e619efcbc3f58	Spice & Grill	19	7.7	6

(19 / 153) processed

ID	Name	Likes	Rating	Ti
0 4bb93b70cf2fc9b6fe64a002	Gandhi Fine Indian Cuisine	81	8.5	

(20 / 153) processed

ID	Name	Likes	Rating	Tips
0 4ec80587d3e3e131f2e72835	Bayleaf	7	7.1	7

(21 / 153) processed

ID	Name	Likes	Rating	Tips
0 4afdf78bf964a520862c22e3	King of Tandoor	25	7.1	23

(22 / 153) processed

ID	Name	Likes	Rating	Tips
0 5539753f498edbace4746b67	Tandoori Masala	12	7.9	2

(23 / 153) processed

ID	Name	Likes	Rating	Tips
0 4f6cae2ee4b0d4a5afcef5c0	Delhi Heights	22	8.2	8

(24 / 153) processed

ID	Name	Likes	Rating	Tips
0 519ff6c8498e1300ddcbd45c	Anarkali Indian Cuisine	14	7.5	8

(25 / 153) processed

ID	Name	Likes	Rating	Tips
0 4db0f4371e729fcc56497f20	Mashallah	19	7.6	7

(26 / 153) processed

ID	Name	Likes	Rating	Tips
0 4b718914f964a520c04b2de3	Madina Restaurant and Sweets	17	7.0	

(27 / 153) processed

ID	Name	Likes	Rating	Tips
0 5631511b498e3d6d7e0a4df0	Tikka Indian Grill	94	8.5	27

(28 / 153) processed

ID	Name	Likes	Rating	Tips
0 5631511b498e3d6d7e0a4df0	Tikka Indian Grill	94	8.5	27

(29 / 153) processed

ID	Name	Likes	Rating	Tips
0 545835a1498e820edc6f636f	Bombay Grill	14	7.1	4

(30 / 153) processed

ID	Name	Likes	Rating	Tips
0 4ae7876ef964a5201eac21e3	Kismet Indian Restaurant	45	7.7	24

(31 / 153) processed

ID	Name	Likes	Rating	Tips
0 54c2bd96498eaf5142e3fe92	Clove Indian Restaurant & Bar	30	7.7	

(32 / 153) processed

ID	Name	Likes	Rating	Tips
0 5914ff32b23dfa207eca38de	Mumbai Masala	13	7.1	7

(33 / 153) processed

ID	Name	Likes	Rating	Tips
0 529d382a11d2dd5ef107e641	Chapati House - NYC	73	7.9	18

(34 / 153) processed

ID	Name	Likes	Rating	Tips
0 54c2bd96498eaf5142e3fe92	Clove Indian Restaurant & Bar	30	7.7	

(35 / 153) processed

ID	Name	Likes	Rating	Tips
0 54c2bd96498eaf5142e3fe92	Clove Indian Restaurant & Bar	30	7.7	

(36 / 153) processed

ID	Name	Likes	Rating	Tips
0 54c2bd96498eaf5142e3fe92	Clove Indian Restaurant & Bar	30	7.7	

(37 / 153) processed

ID	Name	Likes	Rating	Tips
0 54c2bd96498eaf5142e3fe92	Clove Indian Restaurant & Bar	30	7.7	

(38 / 153) processed

```

Tips
0 15
( 35 / 153 ) processed
ID Name Likes Rating Tips
0 56d87f3d498ee215abee5724 Delhi Masala 13 8.6 3
( 36 / 153 ) processed
ID Name Likes Rating
\
0 54c2bd96498eaf5142e3fe92 Clove Indian Restaurant & Bar 30 7.7

Tips
0 15
( 37 / 153 ) processed
ID Name Likes Rating Tips
0 519fe6f5498e30595d370c44 Bawarchi 9 7.7 4
( 38 / 153 ) processed
ID Name Likes Rating Tips
0 5272ca4511d22488f6895caf Drunken Munkey 207 8.5 61
( 39 / 153 ) processed
ID Name Likes Rating Tips
0 4fe4fb50c2eee335e4fea69d Moti Mahal Delux 185 8.4 81
( 40 / 153 ) processed
ID Name Likes Rating Tips
0 4b0dec08f964a520ae5223e3 Alachi Masala 18 7.8 17
( 41 / 153 ) processed
ID Name Likes Rating Tips
0 42489a80f964a5208b201fe3 Swagat 105 8.4 38
( 42 / 153 ) processed
ID Name Likes Rating Tips
0 49d91c12f964a520015e1fe3 The Kati Roll Company 836 8.7 259
( 43 / 153 ) processed
ID Name Likes Rating Tips
0 59fcd48c464d6567ed2f5e37 The Kati Roll Company 18 8.7 2
( 44 / 153 ) processed
ID Name Likes Rating Tips
0 4b4aab62f964a520978c26e3 Dil-e Punjab Deli 104 8.6 42
( 45 / 153 ) processed
ID Name Likes Rating Tips
0 5b5a2c9e66f3cd002ca0aab5 The Drunken Munkey 25 9.0 3
( 46 / 153 ) processed
ID Name Likes Rating Tips
0 4bbb9dbded7776b0e1ad3e51 Tamarind TriBeCa 587 9.1 146
( 47 / 153 ) processed
ID Name Likes Rating Tips
0 5b5a2c9e66f3cd002ca0aab5 The Drunken Munkey 25 9.0 3
( 48 / 153 ) processed
ID Name Likes Rating Tips
0 591794df2be42556988e4a8e Rahi 101 8.9 17
( 49 / 153 ) processed
ID Name Likes Rating Tips
0 4d24b812836f5481518645f7 Doaba Deli 41 7.5 13
( 50 / 153 ) processed
ID Name Likes Rating Tips
0 424de080f964a520ae201fe3 Manhattan Valley 42 7.9 30
( 51 / 153 ) processed
ID Name Likes Rating Tips
0 49c5ad0af964a5201b571fe3 Roti Roll 114 8.0 58
( 52 / 153 ) processed
ID Name Likes Rating Tips
0 538ba1f2498e279098e4210a Awadh 49 8.0 13
( 53 / 153 ) processed

```

	ID	Name	Likes	Rating	Tips
0	4ad12c9df964a52040dd20e3	Aangan	35	7.5	14

(54 / 153) processed

	ID	Name	Likes	Rating	Tips
0	49c5ad0af964a5201b571fe3	Roti Roll	114	8.0	58

(55 / 153) processed

	ID	Name	Likes	Rating	Tips
0	529d382a11d2dd5ef107e641	Chapati House - NYC	73	7.9	18

(56 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4a70a75bf964a52016d81fe3	Bhatti Indian Grill	415	8.7	157

(57 / 153) processed

	ID	Name	Likes	Rating	Tips
0	57f7cbbe498edf8f07c7ba83	Sahib	59	8.7	13

(58 / 153) processed

	ID	Name	Likes	Rating	Tips
0	523b2b42498e1dfabcc8ab15	Pippali	300	8.7	76

(59 / 153) processed

	ID	Name	Likes	Rating	Tips
0	43d537d0f964a520402e1fe3	Vatan	129	8.5	44

(60 / 153) processed

	ID	Name	Likes	Rating	Tips
0	5b770657c0cacb002c89bc63	The Kati Roll Company	13	8.1	2

(61 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4aa56c81f964a5204e4820e3	Seva Indian Cuisine	237	9.0	130

(62 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4afdcf29f964a520162b22e3	Rajbhog Sweets	38	8.4	25

(63 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4b998d3ff964a520fc8235e3	Maharaja Sweets & Snacks	50	8.1	22

(64 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4c7060e734443704ca0e245f	Kababish	29	7.7	17

(65 / 153) processed

	ID	Name	Likes	Rating	Tips
0	49ebb18ff964a52016671fe3	Delhi Heights	34	8.1	23

(66 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4b189424f964a52043d423e3	Dera	47	7.6	19

(67 / 153) processed

	ID	Name	Likes	Rating	Tips
0	3fd66200f964a52009f11ee3	Jackson Diner	141	7.8	76

(68 / 153) processed

	ID	Name	Likes	Rating	Tips
0	527d9cbc498edf0db10bde6b	Samudra	48	8.5	16

(69 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4afdcf29f964a520162b22e3	Rajbhog Sweets	38	8.4	25

(70 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4b998d3ff964a520fc8235e3	Maharaja Sweets & Snacks	50	8.1	22

(71 / 153) processed

	ID	Name	Likes	Rating	Tips
0	49ebb18ff964a52016671fe3	Delhi Heights	34	8.1	23

(72 / 153) processed

	ID	Name	Likes	Rating	Tips
0	527d9cbc498edf0db10bde6b	Samudra	48	8.5	16

(73 / 153) processed

	ID	Name	Likes	Rating	Tips
--	----	------	-------	--------	------


```
0 5782c9ce498edde587f5aa14 Tikka Indian Grill 9 7.5 2
( 74 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 4bbe78bfba9776b070cefdc8 Mehak Mughlai Cuisine 8 7.6 10
( 75 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 4b522029f964a520f26927e3 Sohna Punjab 8 7.4 2
( 76 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 4f1b77d7e4b044fd359e6d21 India Cafe 6 7.1 3
( 77 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 5782c9ce498edde587f5aa14 Tikka Indian Grill 9 7.5 2
( 78 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 4bb2bc48a32876b02e0b01fe Tandoori Hut 6 6.0 15
( 79 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 4bab24ef964a5200ac73ae3 Royal India Palace 7 6.0 3
( 80 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 4adbaef0f964a520ff2921e3 Punjabi Kabab House 7 5.7 7
( 81 / 153 ) processed
```

```
      ID Name Likes Rating Tips
0 5b931ea69d7468002c3b1382 Adda 109 9.1 29
( 82 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 50a287a7e4b0033f830f06db Raj's Indian Kitchen 21 7.3 9
( 83 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 4b1b341bf964a5208af923e3 Five Star Banquet 30 7.1 31
( 84 / 153 ) processed
```

```
      ID Name Likes Rating Tips
0 5b931ea69d7468002c3b1382 Adda 109 9.1 29
( 85 / 153 ) processed
```

```
      ID          Name Likes Rating Ti
ps
0 50e1c9708aca7ff2b3e50353 Nepalese Indian Restaurant 54 8.3
18
( 86 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 5625af69498ebbc62b61a382 Aaheli Restaurant 12 7.8 6
( 87 / 153 ) processed
```

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 4ee8dddb5c5c99a2dc780825

```
      ID          Name Likes Rating T
ips
0 4f1f4996e4b01ff351a7a50c Ayna Agra Indian Restaurant 39 8.1
12
( 89 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 539a4ff0498e79c6745baba9 Masala Box 9 8.0 2
( 90 / 153 ) processed
```

```
      ID          Name Likes Rating Tips
0 539e27b0498e2eba582085ee masalabox 7 6.5 2
( 91 / 153 ) processed
```

```
      ID          Name Likes Rating Tip
s
```

```
0 4b787c49f964a5209cd12ee3 Santoor Indian Restaurant    37    7.6    1
8
```

```
( 92 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4b9030abf964a520397b33e3 Taste of Cochin          9    6.8    4
( 93 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4df0f39dd4c04d0392c853ea Sagar Chinese          7    5.7    6
( 94 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4c0e256ab1b676b06589e186 Sohna Punjab          3    5.9    3
( 95 / 153 ) processed
```

```
Empty DataFrame
```

```
Columns: [ID, Name, Likes, Rating, Tips]
```

```
Index: []
```

```
No data available for id= 4e6bfe1c7d8b2c711b17bbe5
```

```
( 96 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
ing \
0 4be334312fc7d13a7a81083a Taj Mahal Restaurant & Party Hall    24
7.6
```

```
Tips
```

```
0    5
( 97 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4bad49a0f964a52041423be3 Annam Brahma        15    7.8    3
( 98 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4cc08b0900d83704ed474b5c Sybil's Bakery          8    7.0    3
( 99 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4c434b2bd691c9b6ef8f8f0a Sagar Restaurant        10    7.4    6
( 100 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4bad49a0f964a52041423be3 Annam Brahma        15    7.8    3
( 101 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4cc08b0900d83704ed474b5c Sybil's Bakery          8    7.0    3
( 102 / 153 ) processed
```

```
Empty DataFrame
```

```
Columns: [ID, Name, Likes, Rating, Tips]
```

```
Index: []
```

```
No data available for id= 4c69c4b58e7c0f47d48de00f
```

```
( 103 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 562035d9498e2abb4137c2c7 Yaar Indian Restaurant    30    8.5    7
( 104 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 527ffc0811d2d329d5e49abd Jackson Diner          9    7.9    3
( 105 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4e4e3e22bd4101d0d7a5c2d1 Kerala Kitchen          5    8.2    6
( 106 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tips
0 4b647b56f964a520c4b62ae3 Usha Foods & Usha Sweets    33    7.9    10
( 107 / 153 ) processed
```

```

      ID              Name  Likes  Rating  Tip
s
0 4b787c49f964a5209cd12ee3 Santoor Indian Restaurant    37    7.6    1
8
```

(108 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4c0c01e0bbbc676b00d6b4cd5	Mumbai Xpress	16	6.8	18

(109 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4c76ff35a5676dcb72671721	Flavor Of India	6	6.0	6

(110 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 571af96a498e9e392d8d3786

(111 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 55d68c1b498ecf05fa196fe1

(112 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 4ec1b54f4690d2338a359d66

(113 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4df0f39dd4c04d0392c853ea	Sagar Chinese	7	5.7	6

(114 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 4e6bfe1c7d8b2c711b17bbe5

(115 / 153) processed

	ID	Name	Likes	Rating	Ti
0	4f580c1be4b0bdfd0e7e8102	Rajdhani Indian Restaurant	13	8.3	

(116 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4c434b2bd691c9b6ef8f8f0a	Sagar Restaurant	10	7.4	6

(117 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 4b8d5734f964a520b1f532e3

(118 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 4c66f1ac8e9120a1b266d964

(119 / 153) processed

	ID	Name	Likes	Rating	Tips
0	5623f6f9498e5a44a08bfae8	Boishakhi Restaurant	17	8.0	7

(120 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 4dc0aaedae606fe8b71c226b

(121 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4b9be038f964a520393036e3	Dosa Garden	18	7.8	17

(122 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4be74a502468c928505a0243	Taste Of India II	29	8.1	14

(123 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4b9be038f964a520393036e3	Dosa Garden	18	7.8	17

(124 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4db0f4371e729fcc56497f20	Mashallah	19	7.6	7

(125 / 153) processed

	ID	Name	Likes	Rating	Tips
0	519ff6c8498e1300ddcbd45c	Anarkali Indian Cuisine	14	7.5	8

(126 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4b718914f964a520c04b2de3	Madina Restaurant and Sweets	17	7.0	12

(127 / 153) processed

	ID	Name	Likes	Rating	Tips
0	564d283d498e6e851df79d87	Great Indian Curry	3	6.8	2

(128 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4be74a502468c928505a0243	Taste Of India II	29	8.1	14

(129 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 4ce99c2df1c6236a1b7266f0

(130 / 153) processed

	ID	Name	Likes	Rating	Tips
0	5272ca4511d22488f6895caf	Drunken Munkey	207	8.5	61

(131 / 153) processed

	ID	Name	Likes	Rating	Tips
0	56ed855a498ef3bb022352c3	Mughlai Indian Cuisine	25	7.8	9

(132 / 153) processed

	ID	Name	Likes	Rating	Tips
0	5b0c8e2d2f97ec002c67a428	Ashoka Fine Dine	9	7.8	5

(133 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4bbb9dbded7776b0e1ad3e51	Tamarind TriBeCa	587	9.1	146

(134 / 153) processed

	ID	Name	Likes	Rating	Tips
0	49d91c12f964a520015e1fe3	The Kati Roll Company	836	8.7	259

(135 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4bad49a0f964a52041423be3	Annam Brahma	15	7.8	3

(136 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4c434b2bd691c9b6ef8f8f0a	Sagar Restaurant	10	7.4	6

(137 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4cc08b0900d83704ed474b5c	Sybil's Bakery	8	7.0	3

(138 / 153) processed

Empty DataFrame

Columns: [ID, Name, Likes, Rating, Tips]

Index: []

No data available for id= 4cb4a712db32f04dcb5adf4d

(139 / 153) processed

	ID	Name	Likes	Rating	Tips
0	551b7f75498e86c00a0ed2e1	Hungry Bird	8	6.9	3

(140 / 153) processed

	ID	Name	Likes	Rating	Tips
0	4a63bfb4f964a520b3c51fe3	Chola Eclectic Indian Cuisine	153	8.3	

```

Tips
0 56
( 141 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 4fe4fb50c2eee335e4fea69d Moti Mahal Delux    185    8.4    81
( 142 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 4f57f98fe4b0bd50f6bb8b31 The Kati Roll Company    180    8.3    55
( 143 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 59fcd48c464d6567ed2f5e37 The Kati Roll Company    18    8.7    2
( 144 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 5ac3984ae57ca64be4dc6168 INDAY    32    8.2    9
( 145 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 4f57f98fe4b0bd50f6bb8b31 The Kati Roll Company    180    8.3    55
( 146 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 59fcd48c464d6567ed2f5e37 The Kati Roll Company    18    8.7    2
( 147 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 5ac3984ae57ca64be4dc6168 INDAY    32    8.2    9
( 148 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 4c48da9f3013a59356c5f0e1 Saffron Garden    17    7.8    16
( 149 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 5b931ea69d7468002c3b1382 Adda    109    9.1    29
( 150 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 564d283d498e6e851df79d87 Great Indian Curry    3    6.8    2
( 151 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 4b1b341bf964a5208af923e3 Five Star Banquet    30    7.1    31
( 152 / 153 ) processed
      ID      Name  Likes  Rating  Tips
0 50a287a7e4b0033f830f06db Raj's Indian Kitchen    21    7.3    9
( 153 / 153 ) processed

```

In [54]:

```
indian_rest_stats_ny.head()
```

Out[54]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Riverdale	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9
1	Bronx	Kingsbridge	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9
2	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot	5	7.8	11
3	Bronx	Parkchester	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3	5.9	2
4	Bronx	Spuyten Duyvil	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9

In [55]:

```
indian_rest_stats_ny.shape
```

Out[55]:

(153, 7)

In [56]:

```
indian_rest_ny.shape
```

Out[56]:

(153, 4)

So we got data for all restaurants. Now let's save this data to a CSV sheet. In case we by mistake modify it. As the number of calls to get details for venue are premium calls and have a limit of 500 per day, we will refer to saved data sheet CSV if required.

In [57]:

```
indian_rest_stats_ny.to_csv('indian_rest_stats_ny.csv', index=False)
```

Let's verify the data from saved CSV file.

In [58]:

```
indian_rest_stats_ny_csv=pd.read_csv('indian_rest_stats_ny.csv')
```

In [59]:

```
indian_rest_stats_ny_csv.shape
```

Out[59]:

(153, 7)

In [60]:

```
indian_rest_stats_ny_csv.head()
```

Out[60]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Riverdale	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9
1	Bronx	Kingsbridge	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9
2	Bronx	Woodlawn	4c0448d9310fc9b6bf1dc761	Curry Spot	5	7.8	11
3	Bronx	Parkchester	4c194631838020a13e78e561	Melanies Roti Bar And Grill	3	5.9	2
4	Bronx	Spuyten Duyvil	4c04544df423a593ac83d116	Cumin Indian Cuisine	13	6.4	9

In [61]:

```
indian_rest_stats_ny.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 153 entries, 0 to 152
Data columns (total 7 columns):
Borough      153 non-null object
Neighborhood  153 non-null object
ID           153 non-null object
Name         153 non-null object
Likes        153 non-null object
Rating       153 non-null float64
Tips         153 non-null object
dtypes: float64(1), object(6)
memory usage: 8.4+ KB
```

We see that values like Likes, Tips are string values. We would need to convert them into float for further analysis

In [62]:

```
indian_rest_stats_ny['Likes']=indian_rest_stats_ny['Likes'].astype('float64')
```

In [63]:

```
indian_rest_stats_ny['Tips']=indian_rest_stats_ny['Tips'].astype('float64')
```

In [64]:

```
indian_rest_stats_ny.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 153 entries, 0 to 152
Data columns (total 7 columns):
Borough      153 non-null object
Neighborhood  153 non-null object
ID           153 non-null object
Name         153 non-null object
Likes        153 non-null float64
Rating       153 non-null float64
Tips         153 non-null float64
dtypes: float64(3), object(4)
memory usage: 8.4+ KB
```

In [65]:

```
# Resturant with maximum Likes
indian_rest_stats_ny.iloc[indian_rest_stats_ny['Likes'].idxmax()]
```

Out[65]:

```
Borough      Manhattan
Neighborhood  Midtown
ID            49d91c12f964a520015e1fe3
Name          The Kati Roll Company
Likes         836
Rating        8.7
Tips          259
Name: 42, dtype: object
```

In [66]:

```
# Resturant with maximum Rating
indian_rest_stats_ny.iloc[indian_rest_stats_ny['Rating'].idxmax()]
```

Out[66]:

```
Borough      Manhattan
Neighborhood  Tribeca
ID            4bbb9dbded7776b0e1ad3e51
Name          Tamarind TriBeCa
Likes         587
Rating        9.1
Tips          146
Name: 46, dtype: object
```


In [67]:

```
# Resturant with maximum Tips
indian_rest_stats_ny.iloc[indian_rest_stats_ny['Tips'].idxmax()]
```

Out[67]:

```
Borough      Manhattan
Neighborhood  Midtown
ID            49d91c12f964a520015e1fe3
Name          The Kati Roll Company
Likes         836
Rating        8.7
Tips          259
Name: 42, dtype: object
```

Now lets visualize neighborhood with maximum average rating of resturants

In [68]:

```
ny_neighborhood_stats=indian_rest_stats_ny.groupby('Neighborhood',as_index=False).mean()
[['Neighborhood','Rating']]
ny_neighborhood_stats.columns=['Neighborhood','Average Rating']
```

In [69]:

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

Out[69]:

	Neighborhood	Average Rating
11	Civic Center	9.10
68	Tribeca	9.10
64	Sunnyside	9.10
5	Blissville	9.10
0	Astoria	9.00
29	Greenwich Village	9.00
74	West Village	8.95
23	Fort Greene	8.80
45	Murray Hill	8.70
43	Midtown South	8.70

Above are the top neighborhoods with top average rating of Indian resturants

In [70]:

```
ny_borough_stats=indian_rest_stats_ny.groupby('Borough',as_index=False).mean()
[['Borough','Rating']]
ny_borough_stats.columns=['Borough','Average Rating']
```

In [71]:

```
ny_borough_stats.sort_values(['Average Rating'], ascending=False).head()
```

Out[71]:

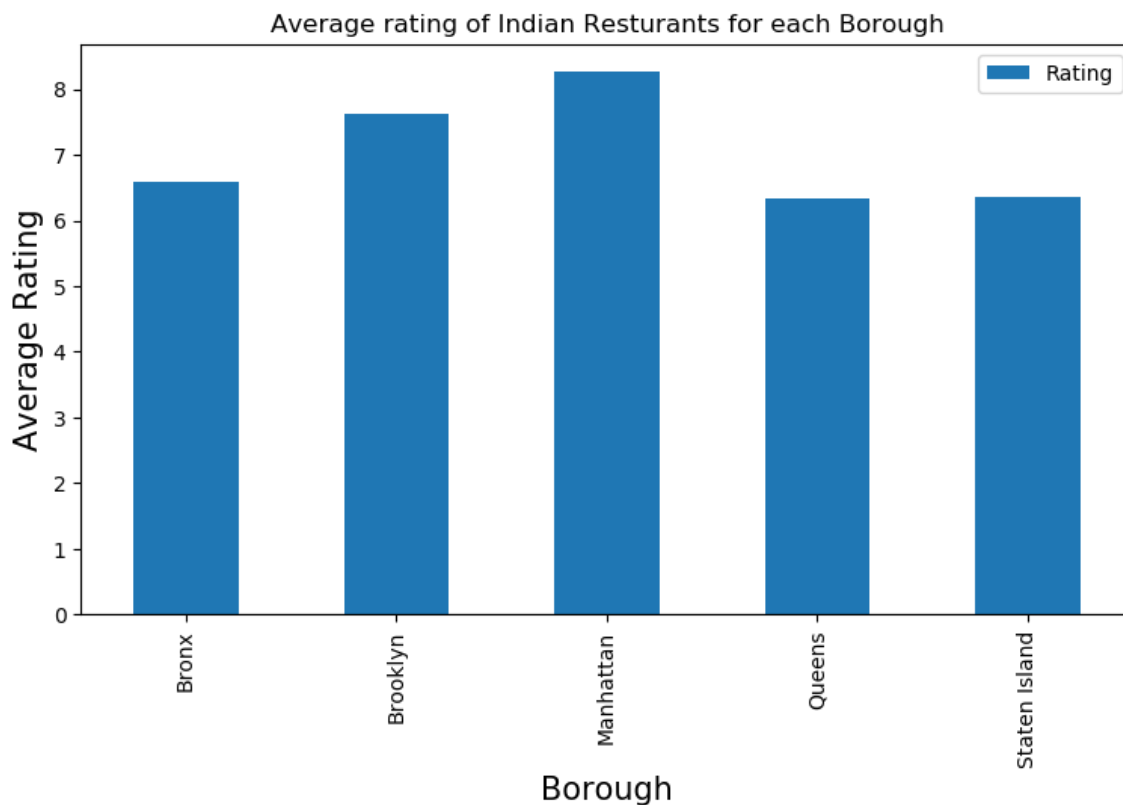
	Borough	Average Rating
2	Manhattan	8.265909
1	Brooklyn	7.614286
0	Bronx	6.575000
4	Staten Island	6.360000
3	Queens	6.335294

Similarly these are the average rating of Indian Resturants for each Borough

Lets visualize it

In [72]:

```
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('Average rating of Indian Resturants for each Borough')
#On x-axis
plt.xlabel('Borough', fontsize = 15)
#On y-axis
plt.ylabel('Average Rating', fontsize=15)
#giving a bar plot
indian_rest_stats_ny.groupby('Borough').mean()['Rating'].plot(kind='bar')
#legend
plt.legend()
#displays the plot
plt.show()
```



We will consider all the neighborhoods with average rating greater or equal 9.0 to visualize on map

In [73]:

```
ny_neighborhood_stats=ny_neighborhood_stats[ny_neighborhood_stats['Average Rating']>=9.0]
```

In [74]:

```
ny_neighborhood_stats
```

Out[74]:

	Neighborhood	Average Rating
0	Astoria	9.0
5	Blissville	9.1
11	Civic Center	9.1
29	Greenwich Village	9.0
64	Sunnyside	9.1
68	Tribeca	9.1

We will join this dataset to original new york data to get lonitude and latitude

In [75]:

```
ny_neighborhood_stats=pd.merge(ny_neighborhood_stats,new_york_data, on='Neighborhood')
```

In [76]:

```
ny_neighborhood_stats=ny_neighborhood_stats[['Borough','Neighborhood','Latitude','Longitude','Average Rating']]
```

In [77]:

```
ny_neighborhood_stats
```

Out[77]:

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Queens	Astoria	40.768509	-73.915654	9.0
1	Queens	Blissville	40.737251	-73.932442	9.1
2	Manhattan	Civic Center	40.715229	-74.005415	9.1
3	Manhattan	Greenwich Village	40.726933	-73.999914	9.0
4	Queens	Sunnyside	40.740176	-73.926916	9.1
5	Staten Island	Sunnyside	40.612760	-74.097126	9.1
6	Manhattan	Tribeca	40.721522	-74.010683	9.1

Now we will show this data on a map

In [78]:

```
# create map and display it
ny_map = folium.Map(location=geo_location('New York'), zoom_start=12)
```

In [79]:

```
# instantiate a feature group for the incidents in the dataframe
incidents = folium.map.FeatureGroup()

# Loop through the 100 crimes and add each to the incidents feature group
for lat, lng, in ny_neighborhood_stats[['Latitude', 'Longitude']].values:
    incidents.add_child(
        folium.CircleMarker(
            [lat, lng],
            radius=10, # define how big you want the circle markers to be
            color='yellow',
            fill=True,
            fill_color='blue',
            fill_opacity=0.6
        )
    )
```

Lets add a new field to dataframe for labeling purpose

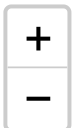
In [80]:

```
ny_neighborhood_stats['Label']=ny_neighborhood_stats['Neighborhood']+', '+ny_neighborhood_stats['Borough']+(' '+ny_neighborhood_stats['Average Rating'].map(str)+'')
```

In [81]:

```
# add pop-up text to each marker on the map
for lat, lng, label in ny_neighborhood_stats[['Latitude', 'Longitude', 'Label']].values:
    folium.Marker([lat, lng], popup=label).add_to(ny_map)
# add incidents to map
ny_map.add_child(incidents)
```

Out[81]:



Leaflet (<http://leafletjs.com>)

Now that we have visualized the Neighborhoods.

Conclusion

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

Limitations

- The ranking is purely on basis of rating of resturants
- The accuracy of data depends purely depends on the data provided by FourSquare