Analysis of Indian restaurants In New York

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Target Audience :
1) Indians in New York looking for top rated Indian restaurants.

2) People looking to start Indian restaurant in New York, this analysis can help them to locate the potential market place to maximize their profits.

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. With its diverse culture , comes diverse food items. There are many restaurants in New York City, each belonging to different categories like Chinese , Indian , French etc. So as part of this project , we will list and visualize all major parts of New York City that has great 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 : Fousquare 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.

Questions that can be asked using the above mentioned datasets

What is the 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 ?

Creating Functions

Getting the Longitude and Latitude Value for the place and hence using them for getting required data from the Foursquare DataBase.

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 intract 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 [31]:
```
def get_venues(lat,lng):

    #set variables
    radius=1000
    LIMIT=100
    CLIENT_ID = 'MZ2QVF3VPSM5WLV1GOB44VQPSQDZVUQ4BRBITS02NT2W0Z0W' # your Foursquare ID
    CLIENT_SECRET ='USP4F2JXEXB2LMU1MMGGXUIJOYJTVM3QL30YVYXJPK5ATAD1' # your Foursquare Secret
    VERSION = '20180605' # 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
```

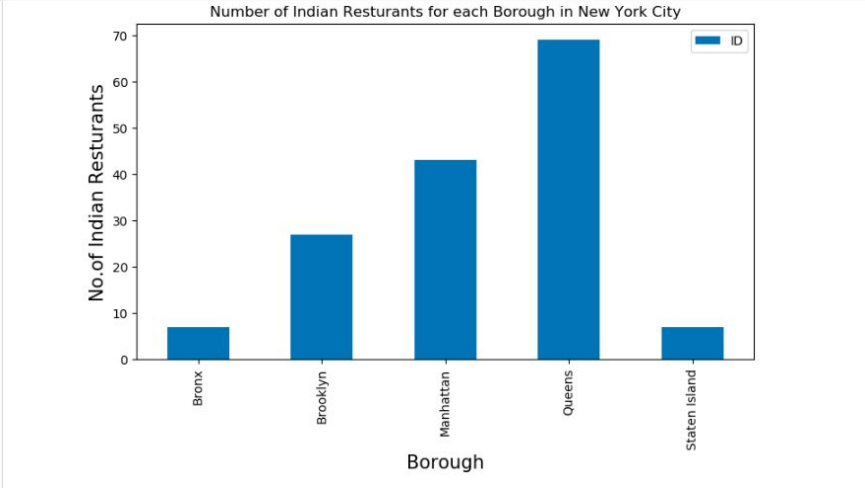
Creating Functions

Collecting Restaurant List.

Now we will collect Indian resturants for each Neighborhood

In [43]:
```
# 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_resturants=venues[venues['Category']=='Indian Restaurant']
    print('(',count,'/',len(new_york_data),')','Indian Resturants in '+Neighborhood+', '+Borough
+':'+str(len(indian_resturants)))
    for resturant_detail in indian_resturants.values.tolist():
        id, name , category=resturant_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:0
( 6 / 306 ) Indian Resturants in Kingsbridge, Bronx:0
```

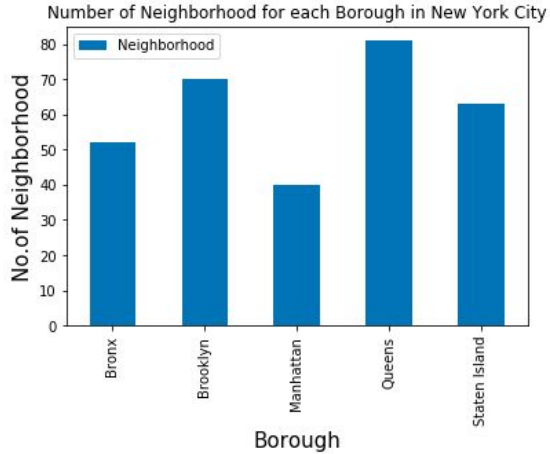


In [15]:
```
new_york_data.shape
```

Out[15]: (306, 4)

In [16]:
```
#So there are total of 306 different Neighborhoods in New York
```

In [17]:
```
# 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()
```



Restaurant List Borough Wise

Final point

Creating Dataframe for Major Analysis and Visualisation to gain insights.

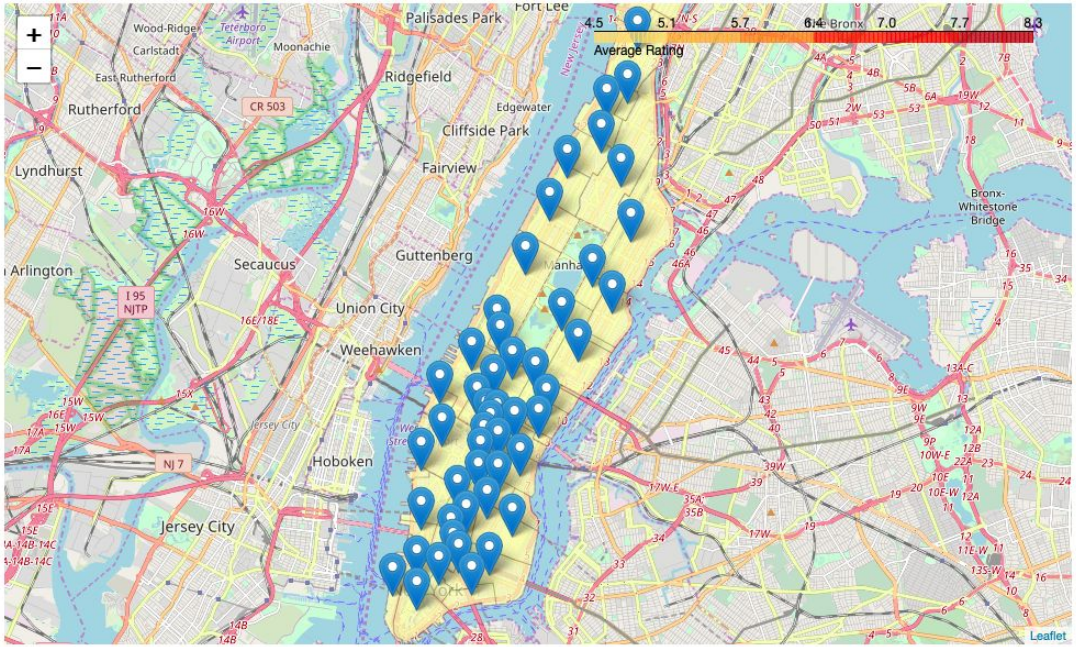
In [63]:
```
# prepare neighborhood list that contains indian resturants
column_names=['Borough', 'Neighborhood', 'ID','Name','Likes','Rating','Tips']
indian_rest_stats_ny=pd.DataFrame(columns=column_names)
count=1


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  4c0448d9310fc9b6bf1dc761  Curry Spot      5     8.0    11
( 1 / 153 ) processed
                         ID                        Name  Likes  Rating  Tips
0  4c194631838020a13e78e561  Melanies Roti Bar And Grill      3     5.9     2
( 2 / 153 ) processed
Empty DataFrame
Columns: [ID, Name, Likes, Rating, Tips]
Index: []
No data available for id= 55dfa36a498e164ef19bef7b
( 3 / 153 ) processed
                         ID                 Name  Likes  Rating  Tips
0  4c04544df423a593ac83d116  Cumin Indian Cuisine     13     6.0     9
( 4 / 153 ) processed
                         ID         Name  Likes  Rating  Tips
0  551b7f75498e86c00a0ed2e1  Hungry Bird      8     6.9     3
```

“A picture speaks more than a thousand words”

Out[119]:



Visualizing to find some of the top rated restaurants to look at best place to eat as well as looking at the place which can be good to start up a new venture.

Thanks!