FINAL REPORT

Capstone Project - The Battle of Neighbourhoods

Introduction:

The City of New York, is the most populous city in the United States. It is diverse and is the financial capital of USA. It is multicultural. It provides lot of business oppourtunities and business friendly environment. It has attracted many different players into the market. It is a global hub of business and commerce. With it's diverse culture, comes diverse food items. There are many resturants in New york City, each beloning to different categories like Russian, Jewish, Chinese, Indian, French etc.

The market of NYC is highly competitive. As it is highly developed city so cost of doing business is also one of the highest. Thus, any new business venture or expansion needs to be analysed carefully. The insights derived from analysis will give good understanding of the business environment which help in strategically targeting the market. This will help in reduction of risk. And the Return on Investment will be reasonable. This would interest anyone who wants to start a new restaurant busyness in Newyork city

With its diverse culture, comes diverse food items. There are many restaurants in New York City, each belonging to different categories like Chinese, Indian, and French etc.

Problem:

- The best location in New York City for Caribbean Cuisine
- The areas with high potential Caribbean Restaurant Market?
- The areas with lack of Caribbean Restaurants
- The best place to stay if you prefer Caribbean Cuisine?

Data:

New York City's demographics show that it is a large and ethnically diverse metropolisc city. With its diverse culture, comes diverse food items. There are many restaurants in New York City, each belonging to different categories like Russian, Caribbean, Chinese, Indian, and French etc.

For this project the next Data were used:

 New York City data that contains list Boroughs, Neighbourhoods along with their latitude and longitude.
This data were set to explore various neighbourhoods of New York City
Data source : https://cocl.us/new_york_dataset

 GeoSpace data
By using geo space data the New York Borough boundaries were fetched.
Data source : https://data.cityofnewyork.us/City-Government/BoroughBoundaries/tqmj-j8zm

 Caribbean restaurants in each neighbourhood of NYC
By using this Foursquare API all the venues in each neighbourhood ere fetched.
Data source : https://api.foursquare.com/v2/venues/explore

Methodology:

 Collect the New York city data from https://cocl.us/new_york_dataset

 Find all venues for each neighborhood using FourSquare API.

In [8]:
```
new_york_data.head()
```

Out[8]:

	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

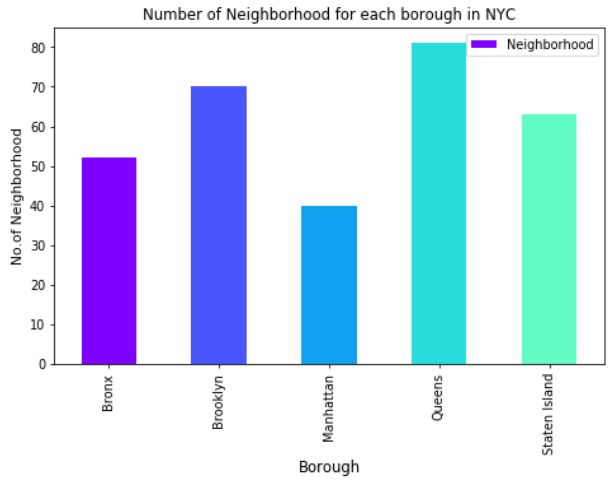
In [9]:
```
new_york_data.shape
```

Out[9]:
```
(306, 4)
```

The above result shows that there are 306 different Neighborhoods in New York.

• Create a bar plot to show different Neighborhoods in New York.

In [10]:
```
plt.figure(figsize=(8,5), dpi = 70)
plt.title('Number of Neighborhood for each borough in NYC') # title
plt.xlabel('Borough', fontsize = 12) #On x-axis
plt.ylabel('No.of Neighborhood', fontsize=11) #On y-axis
colors = cm.rainbow(np.linspace(0, 1, 10))
new_york_data.groupby('Borough')['Neighborhood'].count().plot(kind='bar', color=colors) #giving a bar plot
& color
plt.legend() #Legend
plt.show() #displays the plot
```



According to the plot, Queens has highest number of neighborhoods

 Filter out all Caribbean Restuarant venues.

In [11]:
```
# prepare neighborhood list that contains Caribbean resturants
column_names=['Borough', 'Neighborhood', 'ID','Name']
caribbean_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)
    caribbean_resturants=venues[venues['Category']=='Caribbean Restaurant']
    print('(',count,'/',len(new_york_data),')','Caribbean Resturants in '+Neighborhood+', '+Borough+':'+st
r(len(caribbean_resturants)))
    for resturant_detail in caribbean_resturants.values.tolist():
        id, name , category=resturant_detail
        caribbean_rest_ny = caribbean_rest_ny.append({'Borough': Borough,
                                                      'Neighborhood': Neighborhood,
                                                      'ID': id,
                                                      'Name' : name
                                                     }, ignore_index=True)
    count+=1
```

```
( 1 / 306 ) Caribbean Resturants in Wakefield, Bronx:4
( 2 / 306 ) Caribbean Resturants in Co-op City, Bronx:2
( 3 / 306 ) Caribbean Resturants in Eastchester, Bronx:5
( 4 / 306 ) Caribbean Resturants in Fieldston, Bronx:0
( 5 / 306 ) Caribbean Resturants in Riverdale, Bronx:0
( 6 / 306 ) Caribbean Resturants in Kingsbridge, Bronx:1
( 7 / 306 ) Caribbean Resturants in Marble Hill, Manhattan:1
( 8 / 306 ) Caribbean Resturants in Woodlawn, Bronx:1
( 9 / 306 ) Caribbean Resturants in Norwood, Bronx:2
( 10 / 306 ) Caribbean Resturants in Williamsbridge, Bronx:7
( 11 / 306 ) Caribbean Resturants in Baychester, Bronx:1
( 12 / 306 ) Caribbean Resturants in Pelham Parkway, Bronx:0
( 13 / 306 ) Caribbean Resturants in City Island, Bronx:0
( 14 / 306 ) Caribbean Resturants in Bedford Park, Bronx:1
( 15 / 306 ) Caribbean Resturants in University Heights, Bronx:0
( 16 / 306 ) Caribbean Resturants in Morris Heights, Bronx:0
( 17 / 306 ) Caribbean Resturants in Fordham, Bronx:1
( 18 / 306 ) Caribbean Resturants in East Tremont, Bronx:0
( 19 / 306 ) Caribbean Resturants in West Farms, Bronx:0
( 20 / 306 ) Caribbean Resturants in High  Bridge, Bronx:1
```

 Find the Ratings, Tips, and Like count for all the Caribbean Resturants by FourSquare API.

In [18]:
```
caribbean_rest_stats_ny.head()
```

Out[18]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Wakefield	4d375ce799fe8eec99fd2355	Ripe Kitchen & Bar	70	8.8	33
1	Bronx	Wakefield	4c9e50e38afca09379b2ff15	Ali's Roti Shop	16	8.6	9
2	Bronx	Wakefield	4c10f6aece57c92804a682d2	Jackie's West Indian Bakery	22	7.5	13
3	Bronx	Wakefield	508af256e4b0578944c87392	Cooler Runnings Jamaican Restaurant Inc	7	6.7	4
4	Bronx	Co-op City	4baab2b0f964a520c7803ae3	Country Thyme Cuisine	18	7.9	7

In [19]:
```
caribbean_rest_stats_ny.shape
```

Out[19]:
```
(242, 7)
```

 Next we will sort the data keeping Ratings as the constraint.

In [32]:
```
ny_neighborhood_stats.sort_values(['Average Rating'],ascending=False).head(10)
```

Out[32]:

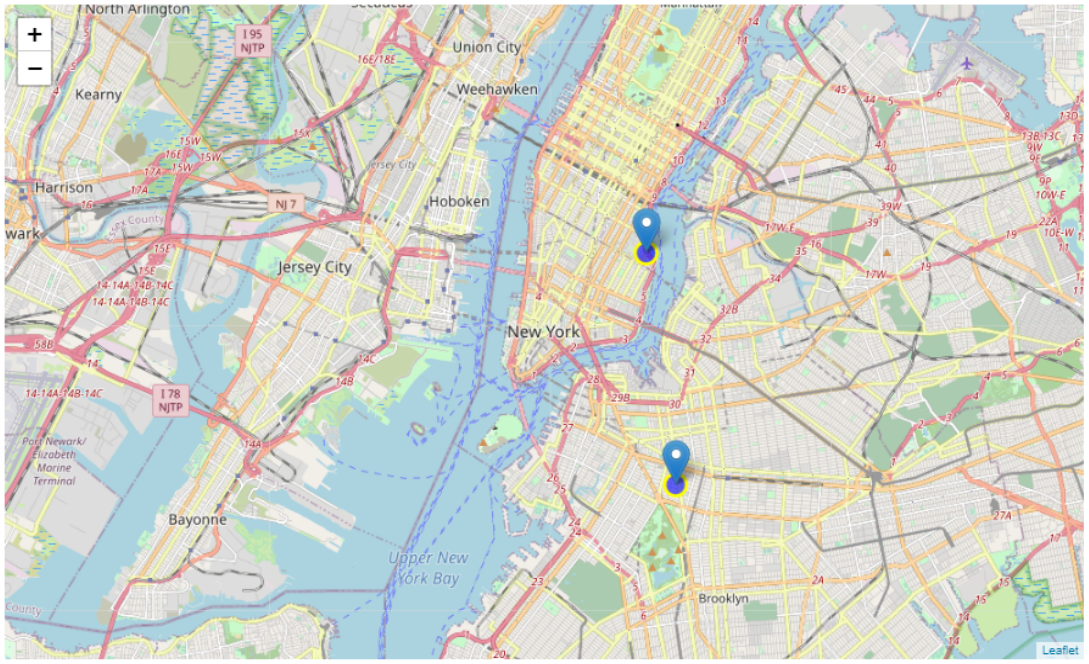
	Neighborhood	Average Rating
61	Prospect Heights	9.2
79	Stuyvesant Town	9.2
10	Bushwick	8.9
37	Hammels	8.8
1	Arverne	8.8
72	Somerville	8.8
34	Fort Greene	8.6
15	Clinton Hill	8.6
68	Rochdale	8.6
89	Woodlawn	8.6

Above are the top neighborhoods with top average rating of Caribbean resturants.

 Visualize the Ranking of neighborhoods using python's Folium library.

In [44]:
```
# 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)
ny_map.add_child(incidents) # add incidents to map
```

Out[44]:



• **Visualize Boroughs according to average Rating.**

 Visualize Boroughs according to average Rating.

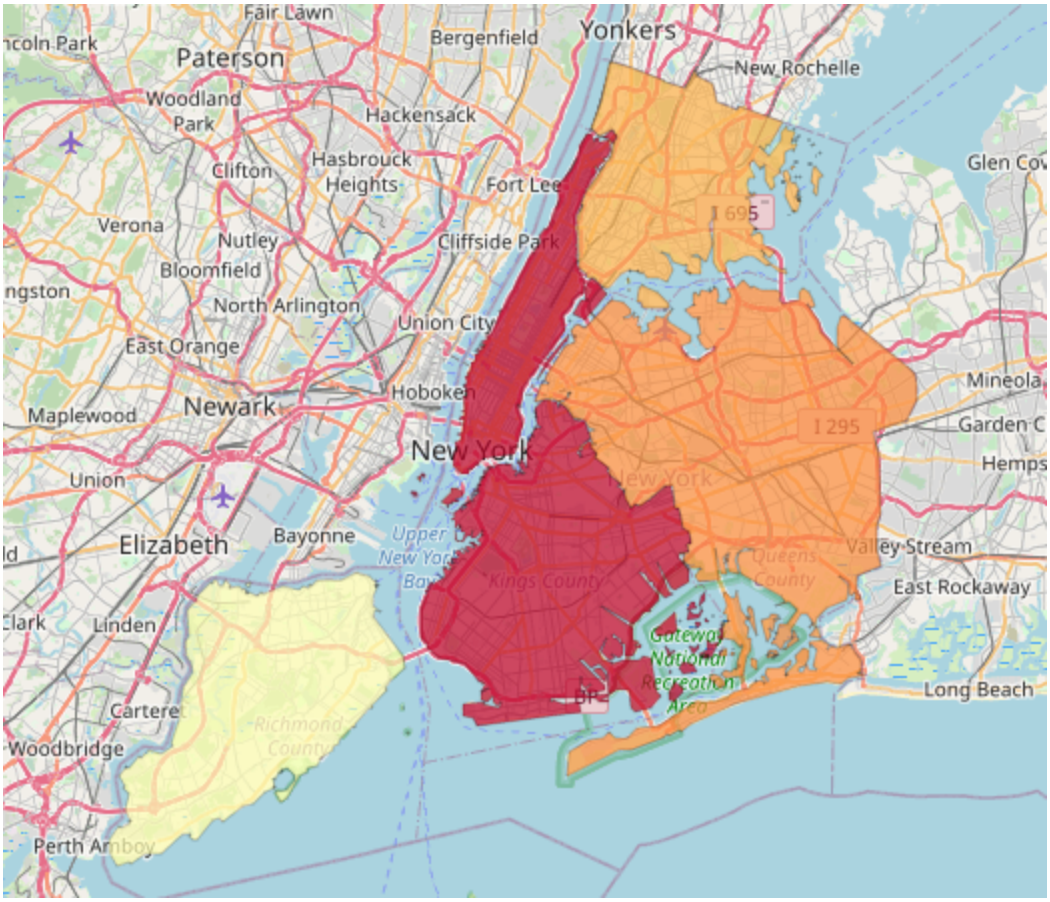
• Visualize Boroughs according to average Rating.

In [45]:
```
ny_map = folium.Map(location=geo_location('New York'), zoom_start=12)
ny_geo = r'BoroughBoundaries.geojson'

map = ny_map.choropleth(
    geo_data=ny_geo,
    data=ny_borough_stats,
    columns=['Borough', 'Average Rating'],
    key_on='feature.properties.boro_name',
    fill_color='YlOrRd',
    fill_opacity=0.7,
    line_opacity=0.2,
    legend_name='Average Rating'
)

# display map
# Save it to a file
ny_map.save('borough_rating.html')
print('Saved to borough_rating.html')
```

```
Saved to borough_rating.html
```



Result & Conclusion:

- Prospect Heights(Brooklyn), Stuyvesant Town(Manhattan), are the best neighborhoods for Caribbean cuisine.

- Manhattan have potential Caribbean Resturant Market.

- Staten Island ranks last in average rating of Caribbean Resturants.

- Manhattan is the best place to stay if you prefer Caribbean Cuisine

Data Science analysis is allowing managers to understand the dynamics of their business, anticipate market shifts and manage risks. In this project the best place to open Caribbean Resturant was provided based on provided data.

Content