Battle of the Neighborhoods – A Case Study of African Restaurants and Cuisines in New York City: Final Report

Problem Description and Background

As of 2019, the population demographics show that approximately 8.3 million people reside in New York City (NYC). Among this population, 25.1% are either African Americans and/or have migrated from Africa. There are so many businesses in NYC and one that is of particular interest is to me the hospitality industry.

One of the major reasons why the hospitality industry thrives in New York city is because of the population and diversity of the residents. In addition, NYC is a center of attraction where people come from all over the world for tourism and business purposes. There are serval businesses within the hospitality industry. One profitable and distinct business is food and catering. Given the nature of life in NYC, the average New Yorker is always on the move and often, relies on eating out at restaurants, cafe's or placing food orders.

The primary goal of this project is the evaluate the boroughs in NYC and determine which would favor the opening of an African restaurant. The choice of an African restaurant will be detailed in the discussion section of the report. This project will be suitable for culinary investors and people looking to start African catering business where there is little to no competition.

Data Description

The data that will be used in solving this problem is the New York json data file that was used in one of the assignments. The data will be imported and arranged properly. It will be read into a pandas data frame and the geographical description (coordinates and maps of NYC and selected boroughs) of the data will be conducted. The following data can be read from the file:

borough, neighborhood, latitude, longitude. In addition, I would use my Foursquare API credentials to explore the neighborhoods within the selected boroughs. This will help determine the suitable location for opening the African restaurant.

Methodology

This section of the report is represented from step 1 to step 6 in the Jupyter notebook. Every step and sub-steps have been explained in detail. These steps are summarized below.

Step 1 (Import Libraries): In this step, the libraries necessary to perform the study are imported. Some of the important libraries are pandas, matplotlib, json, and folium to mention a few. The libraries that have not been installed was installed before importation.

Step 2 (Import and Arrange Data): In this step, the New York city data is a json file. The json library was used to import the data. The data is then transformed into a pandas dataframe. This is essentially transforming the data of nested Python dictionaries into a pandas dataframe. Empty data frames are created, and the data looped through to fill the dataframe one row at a time. After this, the new dataframe is viewed with the. head*()* and .*shape* functions.

Step 3 (Geographical Exploration of New York City): In this step, the geopy library used to get the latitude and longitude values of New York City. After this, the folium library used to visualize the map of New York City which is shown in figure 1.

Step 4 (Geographical Exploration of Three New York Boroughs): In this step, the original dataframe is sliced to create new dataframes for Manhattan, Brooklyn, and Queens. The reason for selecting these boroughs are presented in the discussion section. After creating the new dataframes, their coordinates are obtained and then their maps are visualized. Figure 2 shows the map of Brooklyn. All other maps are found in the notebook.

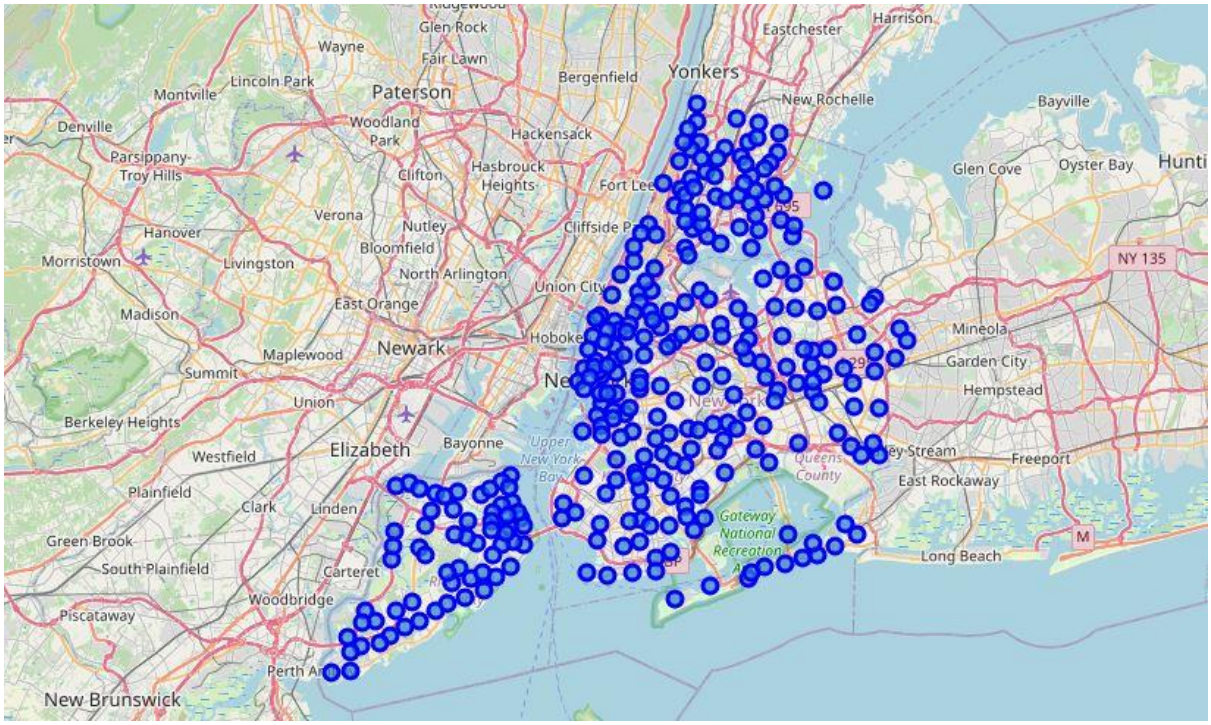

Figure 1: Map of New York City

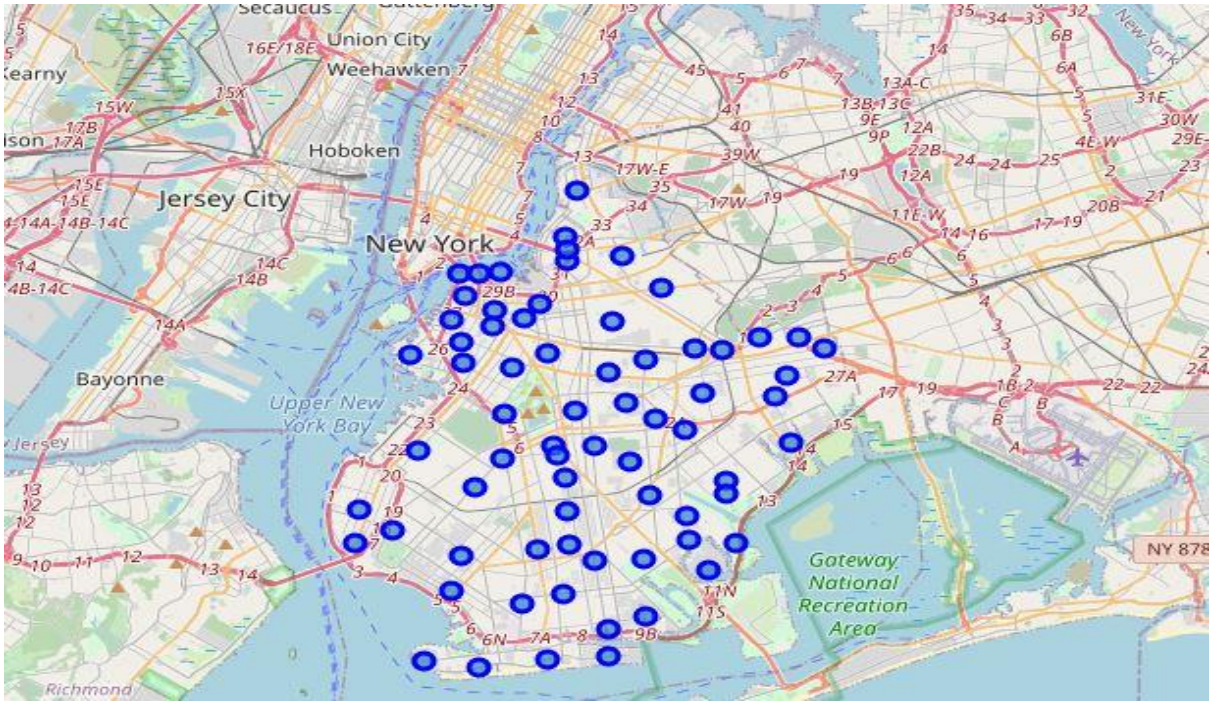

Figure 2: Map of Brooklyn

Step 5 (Using Foursquare API to Explore the Boroughs): In this step, I established my Foursquare API credential. These credentials are client ID, client secret, and version. After

establishing these credentials, the Foursquare API was used to explore the selected boroughs in NYC. First, the coordinates of the first neighborhood in each borough was obtained. Next, a get-category-type function was used to extract the category information for the first 100 venues from these boroughs, after which the json files are cleaned and structured into a pandas dataframe.

Step 6 (Explore Neighbourhoods in Manhattan, Brooklyn, and Queens): In this step, a get-nearby-venue function is created to repeat the whole step 5 for all the venues in the neighbourhoods of the boroughs. After this, each neighbourhood is evaluated for the purpose of locating a new African restaurant.

Results

The results of this work are presented in step 6. In this step, the Foursquare API was used to evaluate and explore the neighborhoods within Manhattan, Brooklyn, and Queens. The results show that: In Manhattan, there are 3 African restaurants all in the Central Harlem neighborhood. In Brooklyn, there is only 1 African restaurant in Ocean Hill neighbourhood In Queens, there is no African restaurant on record.

```
In [371]:
1 #Lets view the venues by category to get a better understanding of African Resturant placement.
2 print('There are only 3 African Resturants')
3 Manhattan_venues.groupby('Venue Category').count()
```

```
There are only 3 African Resturants
```

Out[371]:

Venue Category	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude
Accessories Store	1	1	1	1	1	1
Adult Boutique	1	1	1	1	1	1
Afghan Restaurant	1	1	1	1	1	1
African Restaurant	3	3	3	3	3	3
American Restaurant	70	70	70	70	70	70
Antique Shop	1	1	1	1	1	1
Arcade	1	1	1	1	1	1
Arepa Restaurant	3	3	3	3	3	3
Argentinian Restaurant	5	5	5	5	5	5

Figure 3: Code and result of the number of African restaurants in Manhattan

Figures 3 to 6 shows the codes and results of the number of African restaurants and their locations in Manhattan and Brooklyn. The results for Queens are not presented here because it did not turn out any result. However, the codes can be found in the notebook.

```
In [372]:
#Since, the project is focused on opeining an African Resturant, lets see the neigbohoods in Manhattan where the 3 Afric
print('All 3 African Resturants are in the Central Harlem Neighborhood')
Manhattan_venues[Manhattan_venues['Venue Category']== 'African Restaurant']
```

```
All 3 African Resturants are in the Central Harlem Neighborhood
```

Out[372]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
381	Central Harlem	40.815976	-73.943211	Ponty Bistro Harlem	40.817886	-73.941522	African Restaurant
394	Central Harlem	40.815976	-73.943211	Keur Sokhna	40.813556	-73.945001	African Restaurant
412	Central Harlem	40.815976	-73.943211	Africa Kine Restaurant	40.813728	-73.944426	African Restaurant

Figure 4: Code and results of location of African restaurants in Manhattan

```
In [377]:
#Lets view the venues by category to get a better understanding of African Resturant placement.
print('There is only 1 African Resturant')
Brooklyn_venues.groupby('Venue Category').count()
```

```
There is only 1 African Resturant
```

Out[377]:

Venue Category	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude
Accessories Store	1	1	1	1	1	1
African Restaurant	1	1	1	1	1	1
Airport Terminal	1	1	1	1	1	1
American Restaurant	43	43	43	43	43	43
Animal Shelter	1	1	1	1	1	1
Antique Shop	8	8	8	8	8	8
Arepa Restaurant	2	2	2	2	2	2
Argentinian Restaurant	3	3	3	3	3	3
Art Gallery	16	16	16	16	16	16

Figure 5: Code and result of the number of African restaurants in Brooklyn

```
In [372]:
#Since, the project is focused on opeining an African Resturant, lets see the neigbohoods in Manhattan where the 3 Afric
print('All 3 African Resturants are in the Central Harlem Neighborhood')
Manhattan_venues[Manhattan_venues['Venue Category']== 'African Restaurant']
```

```
All 3 African Resturants are in the Central Harlem Neighborhood
```

Out[372]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
381	Central Harlem	40.815976	-73.943211	Ponty Bistro Harlem	40.817886	-73.941522	African Restaurant
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412	Central Harlem	40.815976	-73.943211	Africa Kine Restaurant	40.813728	-73.944426	African Restaurant

Figure 6: Code and results of location of African restaurants in Brooklyn

Discussions

The three boroughs were chosen because Manhattan is the biggest commercial borough. Queens has the largest land mass (108.1 sq miles) followed by Brooklyn (69.5 sq miles). The two busiest airports in NYC are located in Queens.

Furthermore, according to the demographics of New York City (Wikipedia, 2019), 2 out of every 5 residents in NYC live in Brooklyn and 1 out of every 5 residents live in Queens. Thus, the target borough audience for opening a new African restaurant is in Queens and Brooklyn. Manhattan is considered because of its commercial presence. Given the result, a recommendation for establishing an African restaurant in Queens NYC is made. This rule out the competition challenge and repetition of restaurant types and cuisines.

Conclusion

In this study, NYC data was evaluated to determine the most suitable borough for opening an African restaurant. Several python libraries and methods were used to read and evaluate the data. Foursquare API credentials were also used to investigate the neighborhoods in the selected boroughs. The reasons for selecting three boroughs have been provided in the discussion. This work can be extended to the remaining two boroughs. At the end of the study, Queens borough appears to be the most suitable borough for locating the proposed African restaurant.