Opening an Asian restaurant in Queens, NYC

Capstone project

IBM data science certificate

Introduction

- Asian Americans make up 11.8% of the NYC population, more than a million.

- Queens has the biggest Asian population with more than 550,000 residents.

- Project purpose: identifying the best neighborhoods in Queens to open an Asian restaurant.

- Target audience: businessmen and businesswomen who want to open an Asian restaurant in Queens/ restaurants owners who want to invest in a chain store.

Data

A. New York City dataset

It has the data of all five Boroughs, their Neighborhoods, and the coordinates that define their location.

B. Foursquare location dataset

It has the locations of different venues at each Neighborhood in Queens, NYC. It is obtained using the Foursquare API request
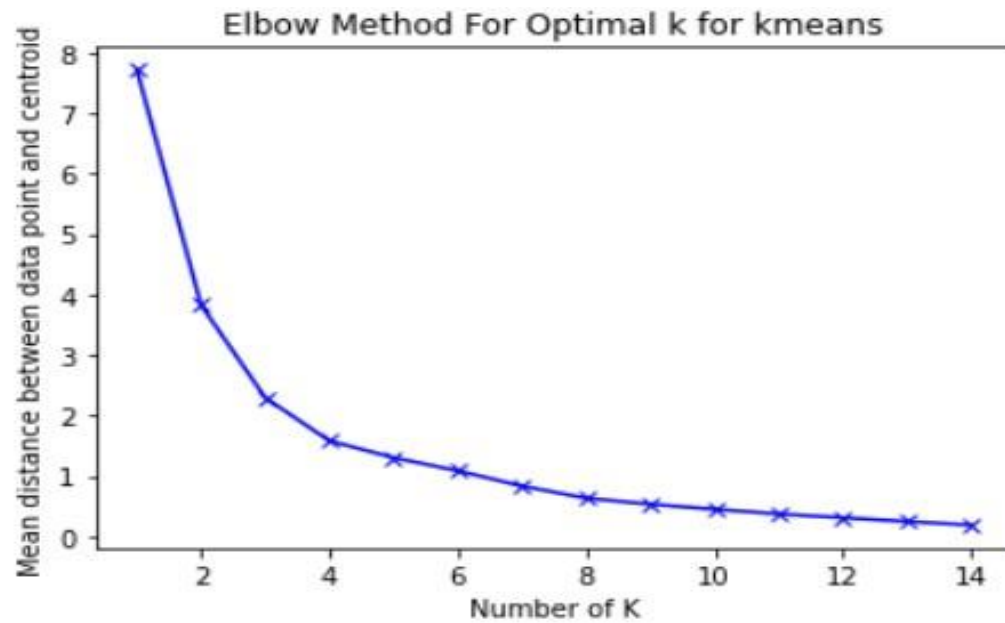
C. Asian population dataset

It provides the Asian population count and percentage in each Queens neighborhood.

Wrangled dataset

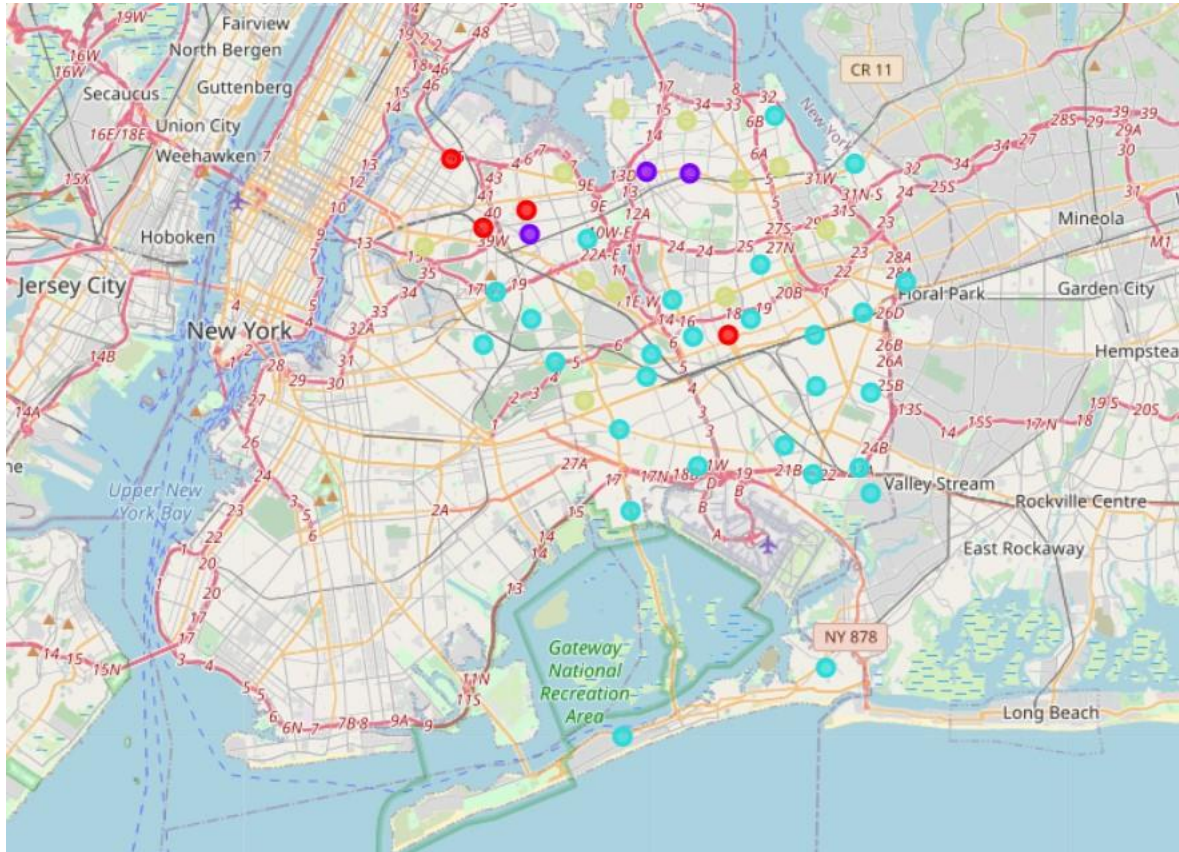|	Neighborhood	Total Restaurants	Total Asian Restaurants	Asian_Population	Total_Population
0	Astoria	33.0	0.0	26800.0	168553.0
1	Auburndale	20.0	1.0	13000.0	26530.0
2	Bay Terrace	4.0	0.0	3212.0	13383.0
3	Bayside	30.0	2.0	21100.0	48505.0
4	Bellerose	3.0	0.0	11600.0	29896.0

The final dataset has 50 rows and 6 columns.
The table at the left shows the first five rows.

K-means clustering

Elbow Method For Optimal k for kmeans

- The K-means clustering was performed based three criteria: total restaurants, Asian restaurants, and Asian population.
- Based on the elbow method, K=4.

K-means, Folium map

In the map, neighborhoods are divided into four clusters and depicted with different colors. Cluster one is represented by red dots, cluster 2 is purple, cluster 3 is blue, and cluster 4 is green.

- Cluster 1: No Asian restaurants and medium to high Asian population, however, there are plenty of restaurants that makes the business environment very competitive.
- Cluster 2: includes neighborhoods with high Asian population and high number of restaurants. There are also 1-3 Asian restaurants in each neighborhood. It means that this cluster does not offer a good spot for our purpose.
- Cluster 4: It has 1-2 Asian restaurants in each neighborhood with medium Asian population, which means that these neighborhoods are well served and offer low potential for a new Asian restaurant.
- Cluster 3: contains neighborhoods with low number of restaurants. Most neighborhoods have less than 10 restaurants and there is no single Asian restaurant. In some neighborhoods there are enough people as the potential customers of a new Asian restaurant. There are some ideal neighborhoods for opening a new Asian restaurant.

Best neighborhoods

	Neighborhood	Total Restaurants	Total Asian Restaurants	Asian_Population	Total_Population
0	South Ozone Park	1.0	0.0	17100.0	74025.0
1	Bellerose	3.0	0.0	11600.0	29896.0
2	Ozone Park	5.0	0.0	16600.0	54426.0

- This table is extracted from the third cluster. Among 27 neighborhoods in the third cluster, only 6 of them have more than 10,000 Asian population, which can be seen as the potential customers for our Asian restaurant

- In these three neighborhoods, there are zero Asian restaurants and less than 5 restaurants in general, which means that the there is a great potential for profitability with minimal number of competitors.

Conclusion

- The top suggestion is South Ozone Park. There are no Asian restaurant and there exist only one restaurant in the neighborhood. With high number of Asian residents, there is a high demand for an Asian restaurant.

- This choice is followed by two other neighborhoods: Ozone Park and Bellerose. In both neighborhoods, there is no Asian restaurant and less than 5 generic restaurants. Besides, there are enough Asian residents who can be the potential customers of a new Asian restaurant.