Current common restaurants in New York

1. Introduction

Starting a new business, especially opening a new restaurant, requires a lot research on the current status of competing restaurants and the potential locations. New York is one of the largest cities in the world and to opening a new restaurant in the city of New York, we need to determine the appropriate location and the focus of the restaurant. Therefore, in this study, the distribution of the current restaurants in each borough is investigated.

The questions to be answered in this investigation include 1) the top 5 most common restaurant types in each borough and 2) how the neighborhoods in each borough cluster based on the top 5 most common types of restaurants.

2. Data

2.1 Data source

The data required in this project include the geological dataset that is available online (link). This dataset includes the name and coordinates (latitude and longitude) of the 5 boroughs and 306 neighborhoods of New York. The other dataset used in this project is obtained from Foursquare (link), containing the name, location, and category of the venues in New York.

2.2 Data preparation

First, the name and coordinates of the 5 boroughs and 306 neighborhoods are extracted from the dataset and stored in a Pandas data frame. Similarly, the name, location, and category of venues related to restaurants, such as American restaurant and Italian restaurants, of each neighborhood are exported and stored in another Pandas data frame.

Second, merge the two data frames together to a new data frame, and use the top 5 most common restaurant types to cluster the neighborhoods in each borough.

3. Methodology

The methodology used in this investigation include data visualization and clustering analysis. Detailed process can be found in the jupyter notebook.

4. Results

4.1 The top 5 most common restaurant types in each borough in New York

Due to the population and the preference of people in each borough, the total amount of restaurants in each borough and the top 5 most common restaurant types are different, as shown in Figure 1.
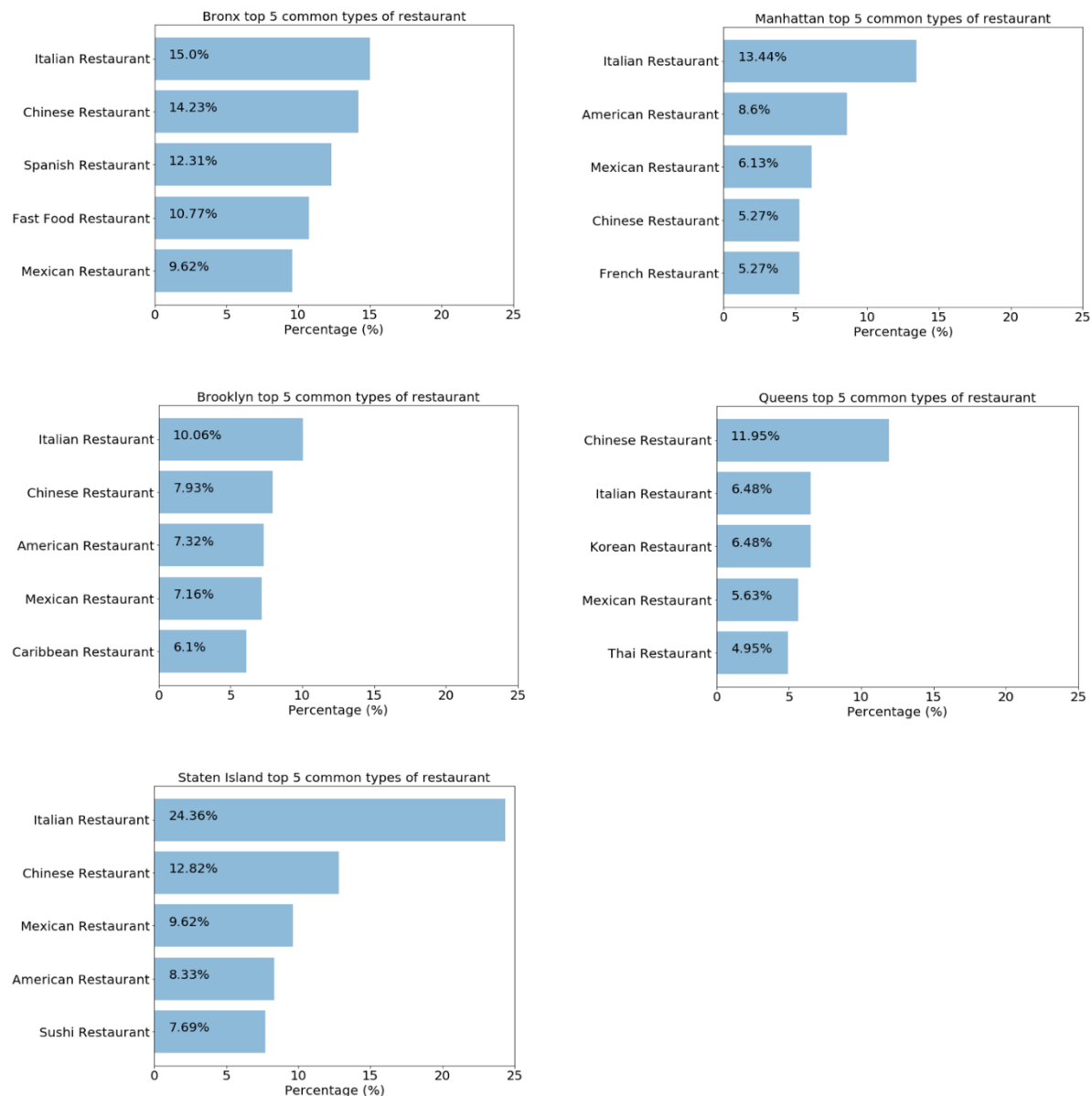

Figure 1. The top 5 most common restaurant types in each of the boroughs in New York. The total percentage of the top 5 types in Bronx, Manhattan, Brooklyn, Queens and Staten Island is 61.9%, 38.7%, 38.6%, 35.5% and 62.8% respectively.
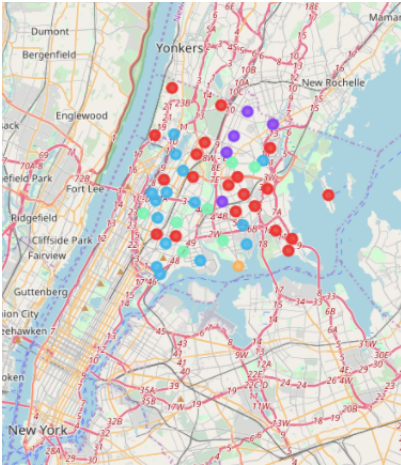
The total number of restaurants in Bronx, Manhattan, Brooklyn, Queens and Staten Island is 260, 929, 656, 586 and 156 respectively. The top 5 types of restaurants in Bronx and Staten Island makes up more than 60% of the total restaurants in each of the borough, but in the other three boroughs, they are only less than 40% of the total restaurants, suggesting that the restaurants in the latter three boroughs have more diversity than Bronx and Staten Island. One of the reasons is the relatively small total number of restaurants in Bronx and Staten Island.

The most common restaurant makes up of less than 15% of the total restaurants is all boroughs except for in Staten Island, where the most common restaurant is approximately 25% of the total restaurants. Italian restaurants are the most common restaurants in all boroughs but Queens, where the Chinese restaurants are the most common type. Italian, Chinese and Mexican restaurants exist in all boroughs as the top 5 most common types.
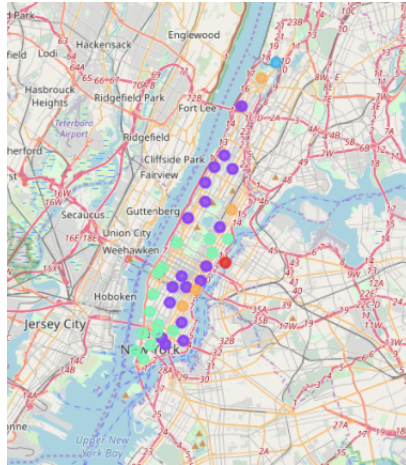
4.2 The clustering analysis of neighborhoods in the 5 boroughs of New York

The neighborhoods in the 5 boroughs of New York are grouped into clusters based on the top 10 most common restaurants. The neighborhoods in each borough are grouped into 5 clusters, as shown on the maps in Figure 2.
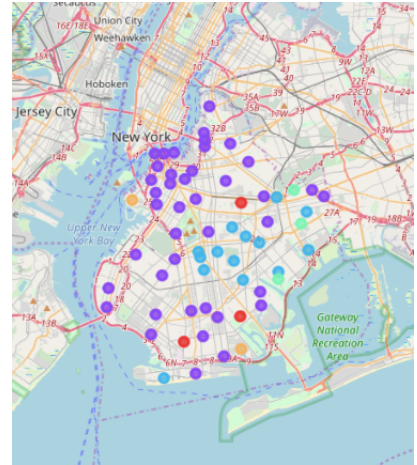
The clusters in each borough shows the neighborhoods with similar most common restaurants within the borough. To determine the appropriate location of the new restaurant, these clustering maps can be used based on different types of restaurants. Other factors that can affect in this process, such as the housing price, the population density and competition with current restaurants, need to be investigated further.
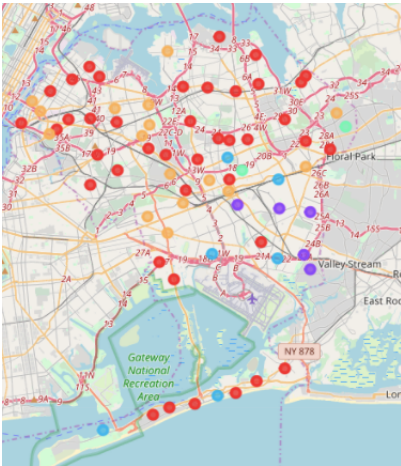
Bronx

Manhattan

Brooklyn

Queens

Staten Island

Figure 2. The clusters of neighborhoods in each borough shown on the map.

5. Discussion

According to the analysis, the five borough shows different results on the top 5 most common restaurant types. However, Italian, Chinese and Mexican restaurants exist in all boroughs as the top 5 most common types. The neighborhoods within each borough are grouped into 5 clusters, and these clusters can help with determining the location of the restaurant. For example, an alternative location can be found based

on similar neighborhoods in the same cluster when the first choice of location is affected by financial or other factors.

6. Conclusion

This investigation shows that although different boroughs have different top 5 most common restaurant, but Italian, Chinese and Mexican restaurants exist in all boroughs as the top 5 most common types. The clusters of the neighborhoods can be a reference in finding an appropriate location for a new restaurant.