



The Battle of Neighborhoods – New York City

IBM Applied Data Science Capstone

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Date: June 13th, 2021



Introduction

In this project, I decided to keep exploring New York City's neighborhood after we segmented and clustered its neighborhoods in Week 3. Firstly, NYC is the most populous city in the United States with an estimated 2019 population of 8,336,817 distributed over about 302.6 square miles (784 km²), which means it is also the most densely populated major city in the United States (); However, compared with NYC, Toronto in Canada may have more population and larger urban area, but its density is much lower than NYC's. Besides NYC's high density, it has also been called as "melting pot" for its large population of international immigrants. Overall, since NYC has been considered the largest city in USA and has been called "metropolis" for a long time, its neighborhood contains all kind of restaurants with different categories, such as Chinese, Indian, Italian food etc., which provides me enough data and choices to do the analysis.

After consideration, I chose to analyze the Japanese restaurants in five major neighborhoods in New York City. This project aimed to provide business starters with a recommendation of the best place to open a new Japanese restaurant.

Business Problems

Since this project's main purpose is to find the best place to open a new Japanese restaurant, the following questions will be answered:

1. List and visualize all Japanese restaurants in five boroughs.
2. Find which borough has the most potential Japanese food market.
3. Find where the best place is for a newly opened Japanese restaurant in NYC.

Data Sources

Based on definition of our problem, factors that will influence our decision are:

1. number of total existing restaurants in each borough (any type of restaurant).
2. number of Japanese restaurants in the neighborhood.

To find these specific factors, we will also use the New York City data that contains list Boroughs, Neighborhoods along with their latitude and longitude.

Moreover, I will use Four-square API as the prime data gathering source as it has a database of millions of places, especially their places API which provides the ability to perform location search, location sharing and details about a business.

Data Analysis

As the data shows, New York City has 5 boroughs and 306 neighborhoods in total. Also, I found out the number of neighborhoods for each borough, presented in Figure 1, where Queens has the greatest number of neighborhood and Manhattan has the least neighborhoods.

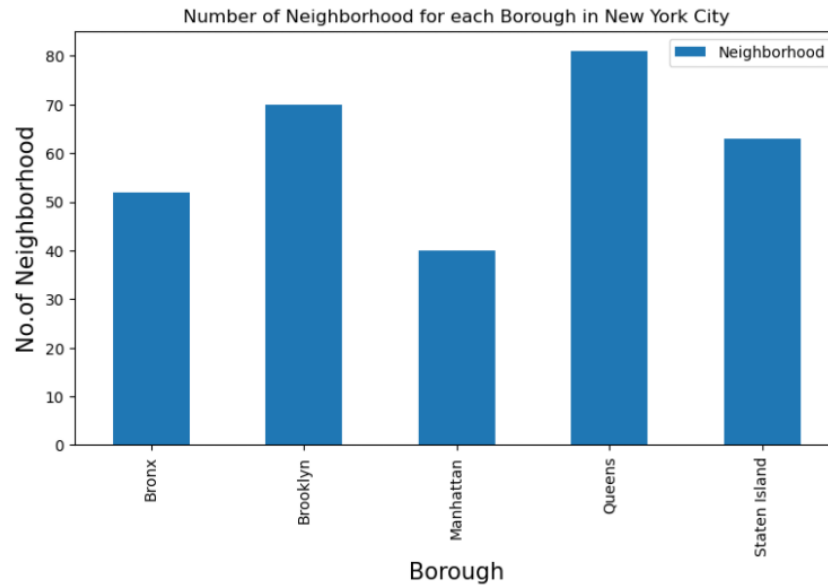


Figure 1 Number of Neighborhood for each borough in NYC

Next, I want to find the number of Japanese restaurants in each neighborhood and borough so that I gathered the restaurant data by Foursquare API, shown in Figure 2 and Figure 3. And there are totally 57 Japanese restaurants in 5 boroughs.

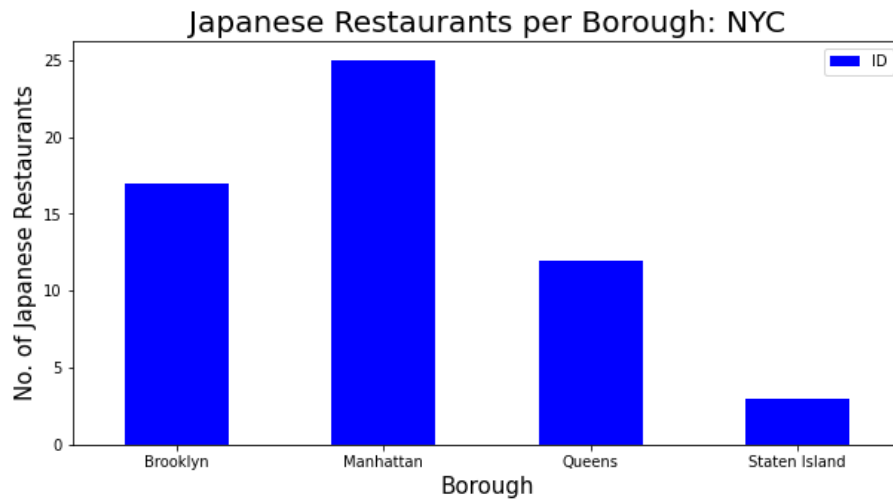


Figure 2 Japanese Restaurant per Borough in NYC

In Figure 2, we could see that Manhattan has the most Japanese Restaurants and Staten Island has the least restaurants. In Figure 3, I tried to list the neighborhoods by its number of Japanese restaurants and visualized the top 5 neighborhoods in the bar plot. As we can find, Flatiron and Murray Hill have the greatest number of restaurants and both neighborhoods are from Manhattan.

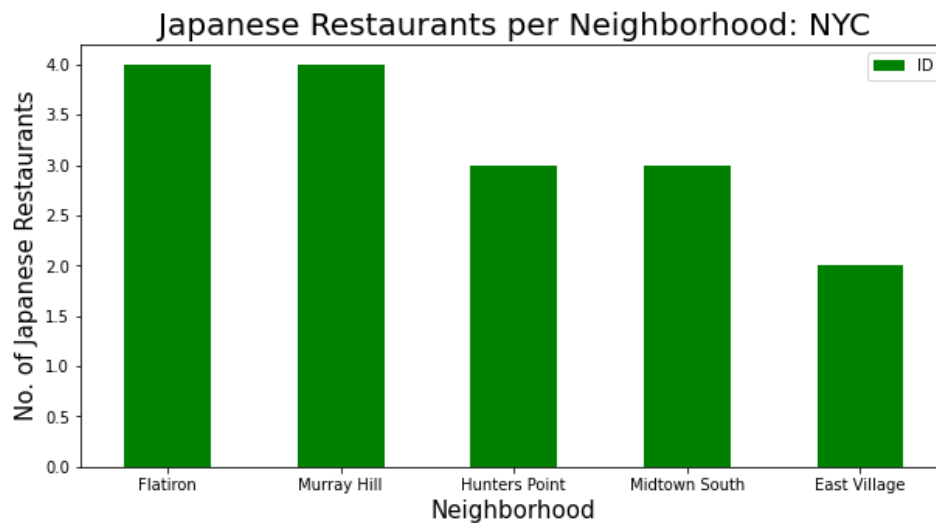


Figure 3 Japanese Restaurants per neighborhood in NYC

After we have a brief understanding of the Japanese restaurants in NYC, we also want to learn more about their rates and ranking so that we could find the best place for us to open a new Japanese restaurant. However, while drawing information from Foursquare, I was not able to get all the ratings and tips of all restaurants due to the limit quota times. Thus, I could only get 50 restaurants' ratings and I will use these 50 pieces of information in the further analysis.

From 50 Japanese restaurants, Morimoto from Manhattan has the maximum likes and tips in Foursquare and Suki Curry from Manhattan has the highest rating. After looking at individual restaurant, I am also interested in the average rating of each borough or neighborhood.

Table 1 Table of top 5 neighborhoods with the highest rating

| | Neighborhood | Average Rating |
|----|---------------------|-----------------------|
| 9 | East Village | 9.250000 |
| 16 | Hunters Point | 8.866667 |
| 7 | Cobble Hill | 8.800000 |
| 8 | Downtown | 8.800000 |
| 28 | North Side | 8.600000 |

Table 2 Table of Boroughs with average restaurant rating

| | Borough | Average Rating |
|---|----------------|-----------------------|
| 1 | Manhattan | 8.220000 |
| 3 | Staten Island | 7.466667 |
| 0 | Brooklyn | 7.456250 |
| 2 | Queens | 6.572727 |

From Table 1, East Village has the highest average rating, but this average rating may be affected by influential points and outliers and cannot be considered as a persuasive reason to

choose that neighborhood. Moreover, in Table 2, Manhattan has the highest average rating with the most Japanese restaurants and Queens has the least average rating with only 6.57.

Next, I visualized the neighborhoods with average rating higher than 8.00 in the New York City map in my notebook, which could be a reference for Japanese food lovers in NYC.

Conclusion

For business starters, Manhattan may be a good choice to open a new Japanese restaurant.

Though Manhattan has already had many Japanese restaurants, its great location and busy population could help you to have a better customer volume compared with other boroughs.

Besides Manhattan, Staten Island is also suitable for a new Japanese restaurant, because it has the least number of Japanese restaurants and may have a large potential market.

For Japanese food lovers, Manhattan could always be the right place to go if you want to enjoy the most traditional and highly appreciated Japanese restaurants; also, you should be aware of Japanese restaurants in Queens since overall, they do not have a good performance.

The Cited Page

"U.S. Census Bureau QuickFacts: New York City". United States Census. Retrieved May 16, 2020, from <https://www.census.gov/quickfacts/fact/table/newyorkcitynewyork/PST045219>.