

Best Neighborhood to Open a Japanese Restaurant in NYC

November 6th, 2020
Saki Kawamura

1. Introduction

This project will examine the best places to open a Japanese restaurant in New York City. New York is a city of diverse food cultures, and new trendy restaurants are opening every day. As a result, competition among restaurants is fierce, and the expectations of visitors to New York City for food are extremely high. New York is also a city of trends, so people are always eager to try new and multicultural foods. New York's foodies include not only discerning New Yorkers, but also tourists and business people from all over the world who love new things.

With the recent trend toward health-consciousness, low-fat, well-balanced Japanese food has become very popular. Japanese fusion cuisine, especially with vegan or French cuisine, is gaining a lot of attention for its great taste and appearance. For a successful Japanese restaurant, we need to somehow find the perfect health-conscious hip area.

Business Problem:

New York City is made up of many different types of neighborhoods - such as financial districts, residential neighborhoods, shopping districts, etc. - each with a completely different atmosphere. There are several things to consider when choosing the right area to open a hip Japanese restaurant that reflects the current health trends. There are three main things to consider.

- ① Demand for **healthy restaurants**
- ② Demand for **Japanese restaurants**
- ③ **Tourist traffic**

About ①, if you choose an area where many vegan restaurants and salad bars congregate, you will have more competition, but you can also increase the number of customers by devising a menu that will attract people who are looking for health-conscious food. It is an important criterion to determine if there are many healthy restaurants in the area, as it will increase the appeal of the area as a healthy gourmet area in future.

About ②, If your restaurant is located in an area with a lot of Japanese food, you will be able to attract people who are looking for Japanese food. You can differentiate your restaurant from other traditional Japanese restaurants, especially if you are developing fusion cuisine with other

cuisines. On the other hand, if you open a restaurant in an area where there is no Japanese cuisine at all, you will monopolize the customers in that area.

And about ③, if you open a restaurant in the middle of a residential area, you may lose the number of tourists. You need to select an area where there is a lot of tourist traffic.

Target Audience:

The main target audience for this project will be developers and investors in the New York City area. It is also useful for ambitious restaurant owners and chefs who want to open a restaurant in New York City, as well as for food and beverage business owners who are interested in healthy gourmet cuisine.

2. Data Acquisition

This section describes the data used to select the right area to open a hip and healthy Japanese restaurant, and how to use it.

- **NYU Spatial Data Repository dataset:** Use to obtain information on NYC's Neighborhood.[1]
- **Foursquare API:** Retrieve the location of an area and its facilities, including the location of restaurants and places of interest.[2]
- **The Python Folium package:** plots this information on a map to highlight the features of each area.

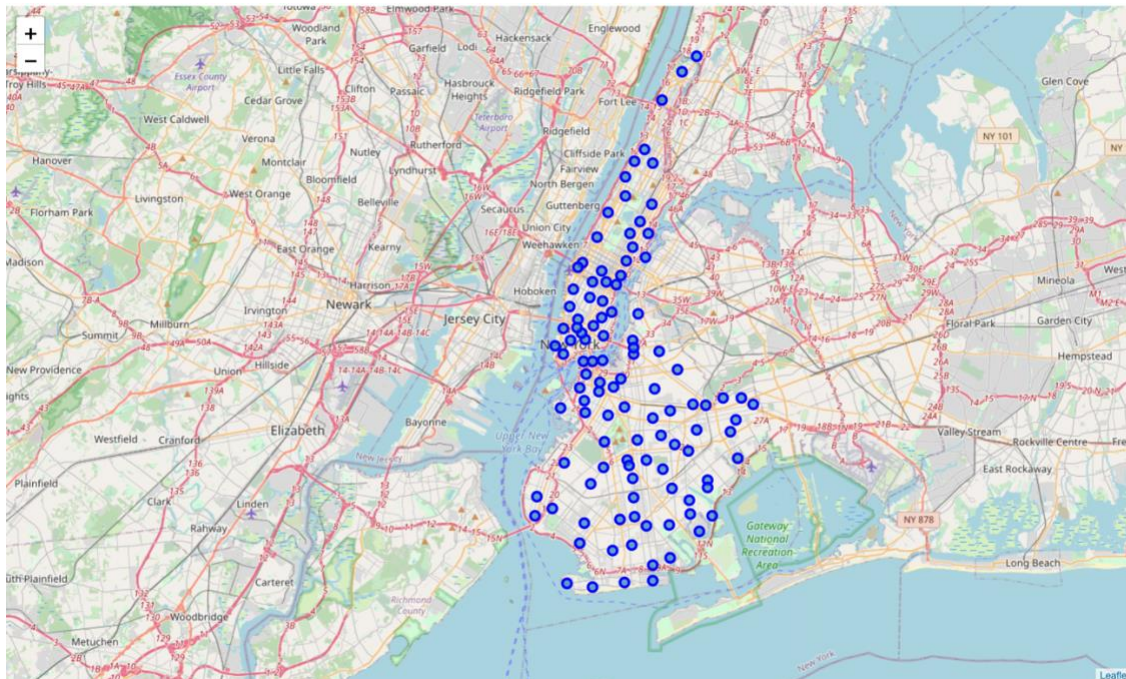
Based on the characteristics of each area, determine the expected crowds and decide the areas where to open a restaurant.

3. Methodology

First, in order to obtain data for NYC's Neighborhood, we pulled a dataset from the NYU Spatial Data Repository database. This dataset contains information on the Borough, Neighborhood, longitude and latitude.

	Borough	Neighborhood	Latitude	Longitude
0	Manhattan	Marble Hill	40.876551	-73.910660
1	Brooklyn	Bay Ridge	40.625801	-74.030621
2	Brooklyn	Bensonhurst	40.611009	-73.995180
3	Brooklyn	Sunset Park	40.645103	-74.010316
4	Brooklyn	Greenpoint	40.730201	-73.954241

In New York, there are five boroughs, but this time we focused on **Manhattan and Brooklyn** and plotted them on the map using Python Folium library.



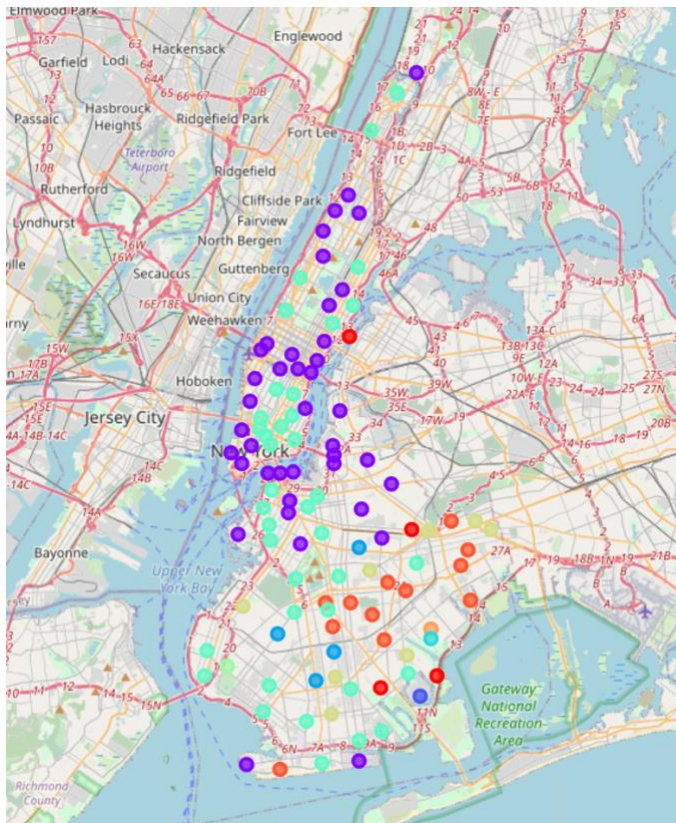
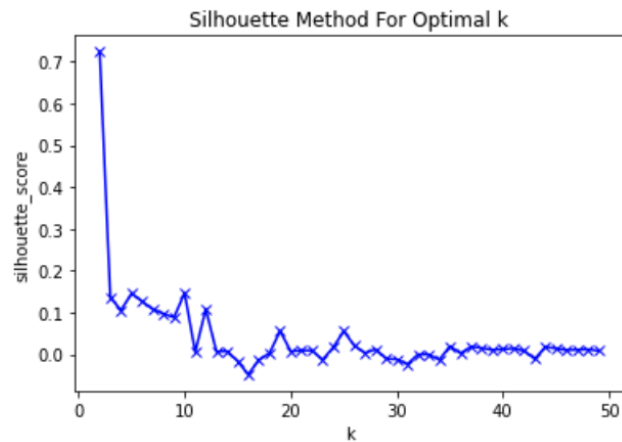
Using the Foursquare API, we extracted maximum 100 Venues in each Neighborhood and listed them along with their latitude, longitude and Venues category.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.91066	Arturo's	40.874412	-73.910271	Pizza Place
1	Marble Hill	40.876551	-73.91066	Bikram Yoga	40.876844	-73.906204	Yoga Studio
2	Marble Hill	40.876551	-73.91066	Tibbett Diner	40.880404	-73.908937	Diner
3	Marble Hill	40.876551	-73.91066	Starbucks	40.877531	-73.905582	Coffee Shop
4	Marble Hill	40.876551	-73.91066	Dunkin'	40.877136	-73.906666	Donut Shop

The results show that there are **5968 Venues and 378 Neighborhoods** in Manhattan and Brooklyn. We'll look at the characteristics of each Neighborhood, but there are too many to narrow down to the best Neighborhoods. Therefore, we used the unsupervised learning K-means algorithm to cluster the Neighborhoods based on the data from the Top 10 of each Neighborhood's Venues category.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Bath Beach	Dessert Shop	Pizza Place	Pharmacy	Gas Station	Donut Shop	Italian Restaurant	Bubble Tea Shop	Cantonese Restaurant	Chinese Restaurant	Fast Food Restaurant
1	Battery Park City	Park	Hotel	Coffee Shop	Gym	Memorial Site	Plaza	Burger Joint	Playground	Shopping Mall	Gourmet Shop
2	Bay Ridge	Italian Restaurant	Spa	Pizza Place	Greek Restaurant	American Restaurant	Bar	Bagel Shop	Café	Sushi Restaurant	Thai Restaurant
3	Bedford Stuyvesant	Coffee Shop	Café	Pizza Place	Bar	Park	BBQ Joint	Fried Chicken Joint	New American Restaurant	Boutique	Gift Shop
4	Bensonhurst	Chinese Restaurant	Italian Restaurant	Ice Cream Shop	Sushi Restaurant	Donut Shop	Park	Pizza Place	Grocery Store	Record Shop	Coffee Shop

Analyzing the K-means with the elbow method, we found that **k=10** was suitable, so we composed 10 clusters. The following images show each cluster county colored and plotted on a map.



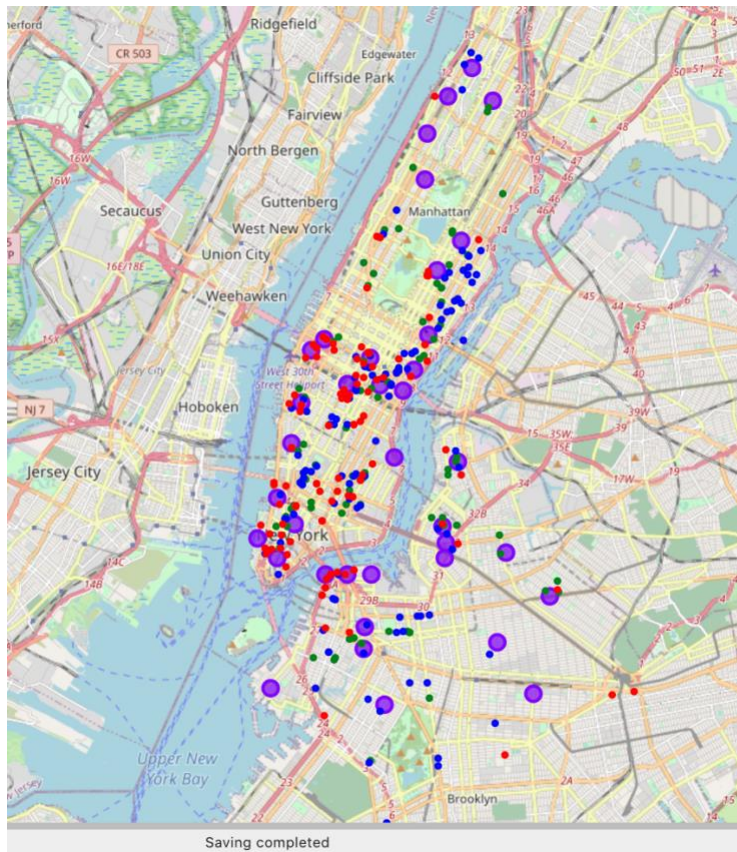
Looking at the 10 generated clusters individually (I won't go into the details of each cluster in the blog post because it would be too long), I can say that all but Cluster1 are residential areas.

Therefore, it seems that the best Neighborhoods are to be found in **Cluster1**. In the map above, the purple markers are Cluster1.

In order to find the best Neighborhood in Cluster 1, we need to consider the three points mentioned above: **healthy restaurants, Japanese restaurants, and tourist traffic**. So, by plotting these venues and Cluster 1 neighborhoods on the same map, we can visualize the best neighborhoods. The data for Venues is the same as before, using Foursquare data.

4. Results

This is the result of merging the data on the same map using Folium. Purple markers are Cluster1's Neighborhood, greens are healthy restaurants, blues are Japanese restaurants, and reds are venues related to tourist traffic, such as hotels, scenic lookouts, nightclubs and so on.



When considering access to each element, following 7 Neighborhoods emerge as the results: **Boerum Hill, Chelsea, Clinton (Hell's Kitchen), Greenpoint, North Side (South Williamsburg), Upper East Side, and West Village**. All of these are Neighborhood names that you may have heard of even if you're not a New Yorker, so the results of the analysis seem to be fine.

However, there are still 7 more candidates, so further comparisons need to be made. So, let's take a look at the Top 5 most common venues in each Neighborhood.

----Boerum Hill----		----Chelsea----		----Clinton----		----Greenpoint----	
	venue		venue		venue		venue
0	Coffee Shop	0	Coffee Shop	0	Theater	0	Bar
1	Dance Studio	1	Art Gallery	1	Gym / Fitness Center	1	Coffee Shop
2	Bar	2	American Restaurant	2	American Restaurant	2	Pizza Place
3	Spa	3	Bakery	3	Gym	3	Cocktail Bar
4	French Restaurant	4	Ice Cream Shop	4	Sandwich Place	4	Deli / Bodega

----North Side--		----Upper East Side----		----West Village----	
	venue		venue		venue
0	Coffee Shop	0	Italian Restaurant	0	Italian Restaurant
1	Wine Bar	1	Exhibit	1	American Restaurant
2	Pizza Place	2	Coffee Shop	2	New American Restaurant
3	Yoga Studio	3	Bakery	3	Cocktail Bar
4	Bar	4	Gym / Fitness Center	4	Coffee Shop

These results show that Chelsea and West Village are areas with a lot of tourist traffic, restaurants and amusement facilities. On the other hand, areas other than Chelsea and West Village were ranked as having a deli and exercise facilities such as gyms and swimming pools, suggesting that these are areas that have a certain amount of tourist traffic despite being residential areas.

So, the answer to the subject of this analysis of which Neighborhood to choose is as follows.

If you want to open a restaurant that doesn't go out of place in a residential area and is easy for tourists and locals alike to visit, then opening a restaurant in one of these five areas(**Boerum Hill, Clinton, Greenpoint, North Side, and Upper East Side**) would be appropriate. Or if you want to open a sophisticated restaurant that tourists and New Yorkers will want to visit by name, **Chelsea or West Village** would be a good fit.

5. Discussion

In this case, the clustering of areas using the k-means algorithm and the data visualization on the map led to the above conclusions. Of course, the results of the analysis were reasonable and satisfactory, but when it comes to actually opening a restaurant, we need to derive more precise analysis results based on the results of detailed analysis of the leasing price of the restaurant, the market price of pricing in the area, and the age range of the customers.

This time, using Foursquare and NYU's database, we were able to successfully merge numerical data on a map, so we can add more factors to our consideration when we perform similar analyses in the future.

6. Conclusion

When thinking about opening a store in a big city like New York City, maybe people will try to choose a place based on feel and atmosphere. Of course, the atmosphere of a city or a sense of familiar places is a very important indicator, but by using numerical and data analysis, it is possible to visualize something abstract, such as the atmosphere that people had about the area.

In that sense, it is very meaningful to use data science to conduct this kind of analysis.

7. References

- [1] [NYU Spatial Data Repository](#)
- [2] [Foursquare API](#)