


IBM Capstone



Choosing a location for a japanese restaurant

Introduction

- In 2017, the city had an estimated population density of 28,491 inhabitants per square mile (11,000/km²), rendering it the nation's most densely populated of all municipalities (of more than 100,000), with several small cities (of fewer than 100,000) in adjacent Hudson County, New Jersey having greater density, as per the 2010 census. Geographically co-extensive with New York County, the borough of Manhattan's 2017 population density of 72,918 inhabitants per square mile (28,154/km²) makes it the highest of any county in the United States and higher than the density of any individual American city.

Business Problem

- New York City's food culture includes an array of international cuisines influenced by the city's immigrant history. Central and Eastern European immigrants, especially Jewish immigrants from those regions, brought bagels, cheesecake, hot dogs, knishes, and delicatessens (or delis) to the city. Italian immigrants brought New York-style pizza and Italian cuisine into the city, while Jewish immigrants and Irish immigrants brought pastrami and corned beef, respectively. Chinese and other Asian restaurants, sandwich joints, trattorias, diners, and coffeehouses are ubiquitous throughout the city.
- In this context, we would like to find the best location for a Japanese restaurant.

Business Problem

- **Goal: Find the best location in New York Manhattan**
- The location of the restaurant is critical and has to factor various parameter (of which location against the competition)
- **Target Audience**
- I would like to open a restaurant in Manhattan. The target audience is any entrepreneur that would like to open such a business

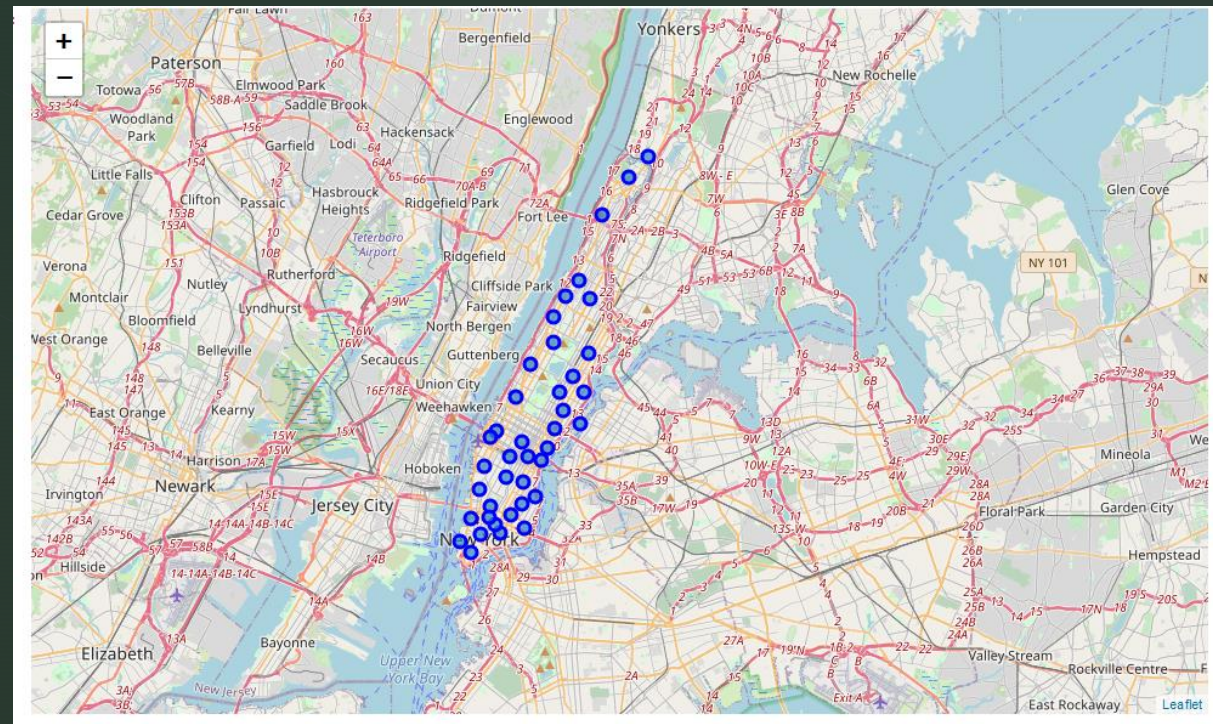
Data

- To find the best location for a Japanese restaurant, we will use the following sources of information:
- From Foursquare Venues: Category 4bf58dd8d48988d111941735 (Japanese restaurant) available at <https://developer.foursquare.com/docs/resources/categories>
- Newyork has a total of 5 boroughs and 306 neighborhoods (with latitude and longitude coordinates) available at https://geo.nyu.edu/catalog/nyu_2451_34572

Methodology

- Week 3 methodology

| | Borough | Neighborhood | Latitude | Longitude |
|---|-----------|----------------|-----------|------------|
| 0 | Bronx | Wakefield | 40.894705 | -73.847201 |
| 1 | Bronx | Co-op City | 40.874294 | -73.829939 |
| 2 | Bronx | Eastchester | 40.887556 | -73.827806 |
| 3 | Bronx | Fieldston | 40.895437 | -73.905643 |
| 4 | Bronx | Riverdale | 40.890834 | -73.912585 |
| 5 | Bronx | Kingsbridge | 40.881687 | -73.902818 |
| 6 | Manhattan | Marble Hill | 40.876551 | -73.910660 |
| 7 | Bronx | Woodlawn | 40.898273 | -73.867315 |
| 8 | Bronx | Norwood | 40.877224 | -73.879391 |
| 9 | Bronx | Williamsbridge | 40.881039 | -73.857446 |



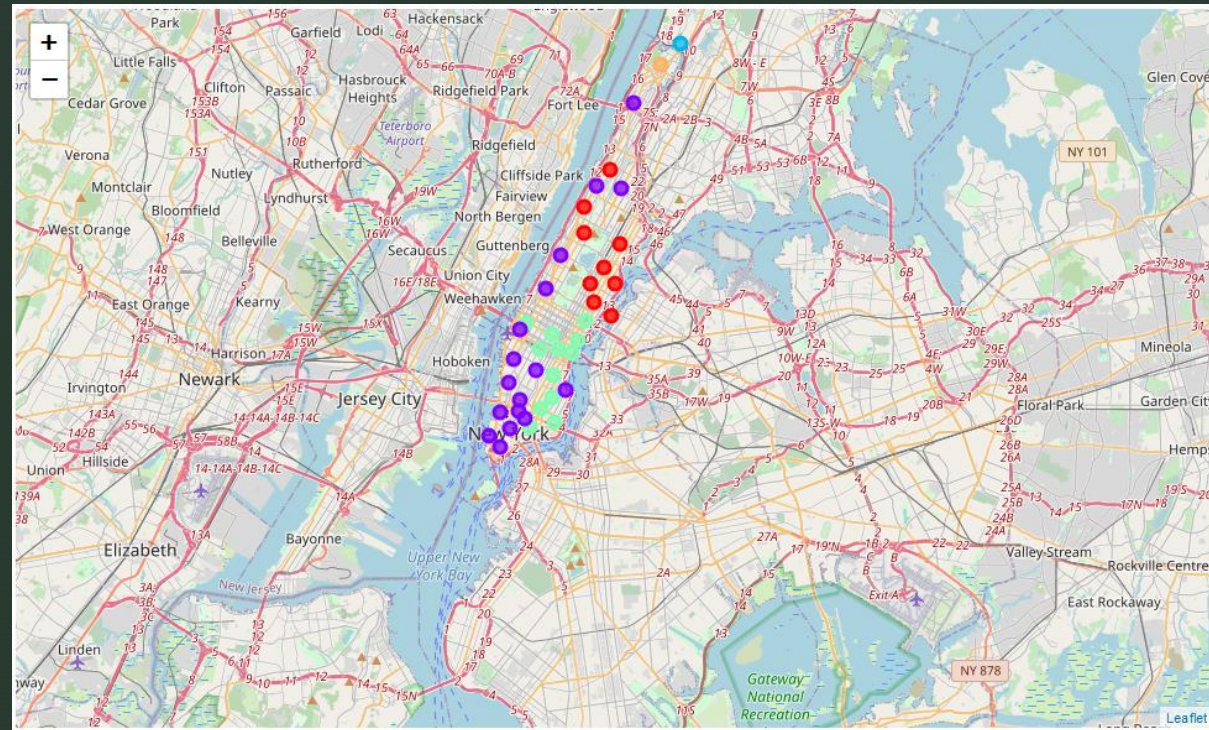
Methodolgy

- The neighborhoods are grouped into clusters (K-means clustering algorithm is used).

| | Borough | Neighborhood | Latitude | Longitude | Cluster Labels | 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 |
|---|-----------|--------------------|-----------|------------|----------------|-----------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------|-----------------------|---------------------------|
| 0 | Manhattan | Marble Hill | 40.876551 | -73.910660 | 2 | Japanese Restaurant | Sushi Restaurant | Vegetarian / Vegan Restaurant | Coffee Shop | French Restaurant | Food Truck | Food & Drink Shop | Fish Market |
| 1 | Manhattan | Chinatown | 40.715618 | -73.994279 | 3 | Japanese Restaurant | Sushi Restaurant | Ramen Restaurant | Korean Restaurant | Noodle House | Asian Restaurant | Café | Sake Bar |
| 2 | Manhattan | Washington Heights | 40.851903 | -73.936900 | 1 | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Vegetarian / Vegan Restaurant | Deli / Bodega | French Restaurant | Food Truck | Food & Drink Shop |
| 3 | Manhattan | Inwood | 40.867684 | -73.921210 | 4 | Sushi Restaurant | Vegetarian / Vegan Restaurant | Coffee Shop | Grocery Store | French Restaurant | Food Truck | Food & Drink Shop | Fish Market |
| 4 | Manhattan | Hamilton Heights | 40.823604 | -73.949688 | 0 | Sushi Restaurant | Japanese Curry Restaurant | Japanese Restaurant | Noodle House | Cocktail Bar | Deli / Bodega | French Restaurant | Food Truck |
| 5 | Manhattan | Manhattanville | 40.816934 | -73.957385 | 1 | Sushi Restaurant | Japanese Restaurant | Japanese Curry Restaurant | Noodle House | Ramen Restaurant | Cocktail Bar | Deli / Bodega | Food Truck |
| 6 | Manhattan | Central Harlem | 40.815976 | -73.943211 | 1 | Sushi Restaurant | Japanese Restaurant | Japanese Curry Restaurant | Ramen Restaurant | Noodle House | Cocktail Bar | Deli / Bodega | Food Truck |
| 7 | Manhattan | East Harlem | 40.792249 | -73.944182 | 0 | Sushi Restaurant | Japanese Restaurant | Hawaiian Restaurant | Vegetarian / Vegan Restaurant | Deli / Bodega | French Restaurant | Food Truck | Food & Drink Shop |
| 8 | Manhattan | Upper East Side | 40.775639 | -73.960508 | 0 | Sushi Restaurant | Japanese Restaurant | Asian Restaurant | Ramen Restaurant | Vegetarian / Vegan Restaurant | Fish Market | Cocktail Bar | Dessert Shop |
| 9 | Manhattan | Yorkville | 40.775930 | -73.947118 | 0 | Sushi Restaurant | Japanese Restaurant | Asian Restaurant | Ramen Restaurant | Vegetarian / Vegan Restaurant | Cocktail Bar | Fish Market | Indian Chinese Restaurant |

Methodolgy

- Folium



Results

Cluster 0

| | 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 |
|----|---------------------|-----------------------|---------------------------|---------------------------|-------------------------------|-------------------------------|---------------------------|-----------------------|---------------------------|-----------------------|------------------------|
| 4 | Hamilton Heights | Sushi Restaurant | Japanese Curry Restaurant | Japanese Restaurant | Noodle House | Cocktail Bar | Deli / Bodega | French Restaurant | Food Truck | Food & Drink Shop | Fish Market |
| 7 | East Harlem | Sushi Restaurant | Japanese Restaurant | Hawaiian Restaurant | Vegetarian / Vegan Restaurant | Deli / Bodega | French Restaurant | Food Truck | Food & Drink Shop | Fish Market | Dessert Shop |
| 8 | Upper East Side | Sushi Restaurant | Japanese Restaurant | Asian Restaurant | Ramen Restaurant | Vegetarian / Vegan Restaurant | Fish Market | Cocktail Bar | Dessert Shop | French Restaurant | Food Truck |
| 9 | Yorkville | Sushi Restaurant | Japanese Restaurant | Asian Restaurant | Ramen Restaurant | Vegetarian / Vegan Restaurant | Cocktail Bar | Fish Market | Indian Chinese Restaurant | Chinese Restaurant | Café |
| 10 | Lenox Hill | Sushi Restaurant | Japanese Restaurant | Asian Restaurant | Ramen Restaurant | Vegetarian / Vegan Restaurant | Seafood Restaurant | Fish Market | Cocktail Bar | Beer Bar | Chinese Restaurant |
| 11 | Roosevelt Island | Sushi Restaurant | Japanese Restaurant | Asian Restaurant | Ramen Restaurant | Cocktail Bar | Beer Bar | Seafood Restaurant | Deli / Bodega | Food Truck | Food & Drink Shop |
| 25 | Manhattan Valley | Sushi Restaurant | Japanese Restaurant | Hawaiian Restaurant | Vegetarian / Vegan Restaurant | Deli / Bodega | French Restaurant | Food Truck | Food & Drink Shop | Fish Market | Dessert Shop |
| 26 | Morningside Heights | Sushi Restaurant | Japanese Restaurant | Japanese Curry Restaurant | Ramen Restaurant | Hawaiian Restaurant | Deli / Bodega | French Restaurant | Food Truck | Food & Drink Shop | Fish Market |
| 30 | Carnegie Hill | Sushi Restaurant | Japanese Restaurant | Asian Restaurant | Ramen Restaurant | Vegetarian / Vegan Restaurant | Indian Chinese Restaurant | Building | Café | Chinese Restaurant | Cocktail Bar |

Cluster 1

| | 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 |
|----|--------------------|-----------------------|-----------------------|---------------------------|-------------------------------|---------------------------|---------------------------|-----------------------|-------------------------|-------------------------|------------------------|
| 2 | Washington Heights | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Vegetarian / Vegan Restaurant | Deli / Bodega | French Restaurant | Food Truck | Food & Drink Shop | Fish Market | Dessert Shop |
| 5 | Manhattanville | Sushi Restaurant | Japanese Restaurant | Japanese Curry Restaurant | Noodle House | Ramen Restaurant | Cocktail Bar | Deli / Bodega | Food Truck | Food & Drink Shop | Fish Market |
| 6 | Central Harlem | Sushi Restaurant | Japanese Restaurant | Japanese Curry Restaurant | Ramen Restaurant | Noodle House | Cocktail Bar | Deli / Bodega | Food Truck | Food & Drink Shop | Fish Market |
| 12 | Upper West Side | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Japanese Curry Restaurant | Asian Restaurant | Grocery Store | Sake Bar | Deli / Bodega | Food Truck | Food & Drink Shop |
| 13 | Lincoln Square | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Japanese Curry Restaurant | Smoothie Shop | Noodle House | Chinese Restaurant | Sake Bar | Soba Restaurant | Asian Restaurant |
| 17 | Chelsea | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Japanese Curry Restaurant | Asian Restaurant | Udon Restaurant | Fish Market | Cocktail Bar | Deli / Bodega | Dessert Shop |
| 18 | Greenwich Village | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Udon Restaurant | Japanese Curry Restaurant | Coffee Shop | Dessert Shop | Noodle House | Cocktail Bar | Soba Restaurant |
| 21 | Tribeca | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Japanese Curry Restaurant | Noodle House | Asian Restaurant | Udon Restaurant | Korean Restaurant | New American Restaurant | Dessert Shop |
| 22 | Little Italy | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Korean Restaurant | Noodle House | Japanese Curry Restaurant | Udon Restaurant | Sake Bar | Café | Asian Restaurant |
| 23 | Soho | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Noodle House | Japanese Curry Restaurant | Udon Restaurant | Korean Restaurant | New American Restaurant | Dessert Shop | Food & Drink Shop |
| 24 | West Village | Sushi Restaurant | Japanese Restaurant | Ramen Restaurant | Japanese Curry Restaurant | Asian Restaurant | Bubble Tea Shop | Udon Restaurant | Cocktail Bar | New American Restaurant | Deli / Bodega |

Cluster 2

| | 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 | Marble Hill | Japanese Restaurant | Sushi Restaurant | Vegetarian / Vegan Restaurant | Coffee Shop | French Restaurant | Food Truck | Food & Drink Shop | Fish Market | Dessert Shop | Deli / Bodega |

Results

Cluster 3

| | 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 |
|----|-----------------|-----------------------|-----------------------|-----------------------|---------------------------|---------------------------|-------------------------------|---------------------------|-------------------------------|-------------------------------|---------------------------|
| 1 | Chinatown | Japanese Restaurant | Sushi Restaurant | Ramen Restaurant | Korean Restaurant | Noodle House | Asian Restaurant | Café | Sake Bar | Vegetarian / Vegan Restaurant | Food & Drink Shop |
| 14 | Clinton | Sushi Restaurant | Ramen Restaurant | Japanese Restaurant | Japanese Curry Restaurant | Seafood Restaurant | Asian Restaurant | Chinese Restaurant | Cocktail Bar | Restaurant | American Restaurant |
| 15 | Midtown | Japanese Restaurant | Ramen Restaurant | Sushi Restaurant | Asian Restaurant | Udon Restaurant | Vegetarian / Vegan Restaurant | Sandwich Place | Food & Drink Shop | Restaurant | French Restaurant |
| 16 | Murray Hill | Japanese Restaurant | Sushi Restaurant | Ramen Restaurant | Asian Restaurant | Udon Restaurant | Vegetarian / Vegan Restaurant | Tonkatsu Restaurant | Soba Restaurant | French Restaurant | Restaurant |
| 19 | East Village | Japanese Restaurant | Sushi Restaurant | Ramen Restaurant | Sake Bar | Café | Dessert Shop | Udon Restaurant | Coffee Shop | Japanese Curry Restaurant | Shabu-Shabu Restaurant |
| 20 | Lower East Side | Japanese Restaurant | Sushi Restaurant | Ramen Restaurant | Sake Bar | Café | Dessert Shop | Udon Restaurant | Korean Restaurant | Coffee Shop | Japanese Curry Restaurant |
| 27 | Gramercy | Japanese Restaurant | Sushi Restaurant | Ramen Restaurant | Asian Restaurant | Udon Restaurant | Soba Restaurant | Japanese Curry Restaurant | Dessert Shop | Coffee Shop | Sake Bar |
| 31 | Noho | Japanese Restaurant | Sushi Restaurant | Ramen Restaurant | Japanese Curry Restaurant | Café | Dessert Shop | Udon Restaurant | Coffee Shop | Noodle House | Sake Bar |
| 33 | Midtown South | Japanese Restaurant | Sushi Restaurant | Ramen Restaurant | Asian Restaurant | Japanese Curry Restaurant | Restaurant | Udon Restaurant | Vegetarian / Vegan Restaurant | Shabu-Shabu Restaurant | Food Truck |

Cluster 4

| | 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 |
|---|--------------|-----------------------|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 3 | Inwood | Sushi Restaurant | Vegetarian / Vegan Restaurant | Coffee Shop | Grocery Store | French Restaurant | Food Truck | Food & Drink Shop | Fish Market | Dessert Shop | Deli / Bodega |



Discussion

The result is based on extracted Foursquare data only. A lot more factors are to be taken into account when choosing a location (traffic, rent prices,...)



Conclusion

The best locations were found (cluster 2 and 4) based on the available data and the methodology described above but they are not the only factors to be taken into account when opening a Japanese restaurant