

The Battle of the Neighborhoods

1. Introduction and Business Problem :

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.

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)

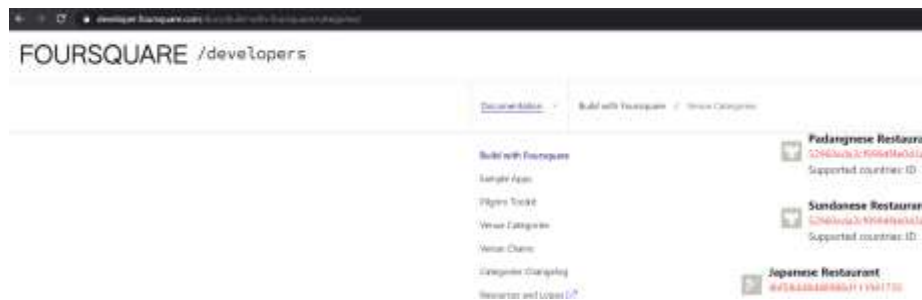
Target Audience

I would like to open a restaurant in Manhattan. The target audience is any entrepreneur that would like to open such a business

2. Data

To find the best location for a Japanese restaurant, we will use the following sources of information:

1. From Foursquare Venues: Category 4bf58dd8d48988d111941735 (Japanese restaurant) available at <https://developer.foursquare.com/docs/resources/categories>



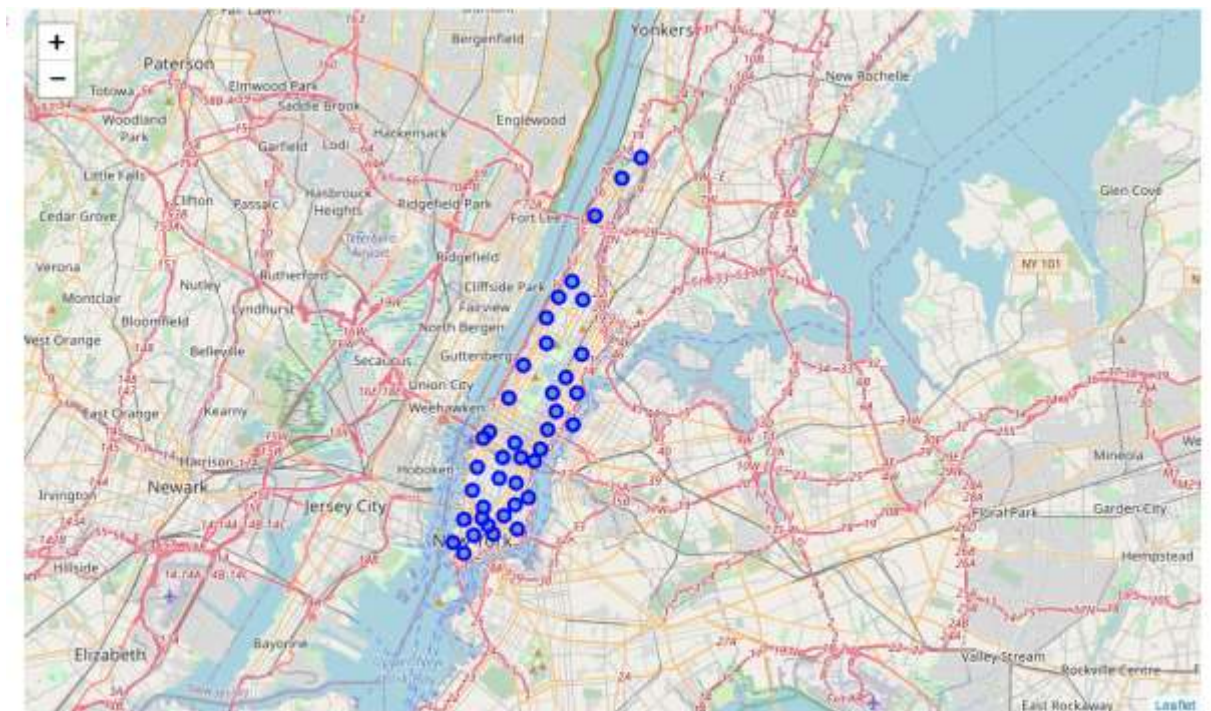
2. New York has a total of 5 boroughs and 306 neighborhoods (with latitude and longitude coordinates) available at https://geo.nyu.edu/catalog/nyu_2451_34572



3. Methodology

The Week 3 methodology will be used.

	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

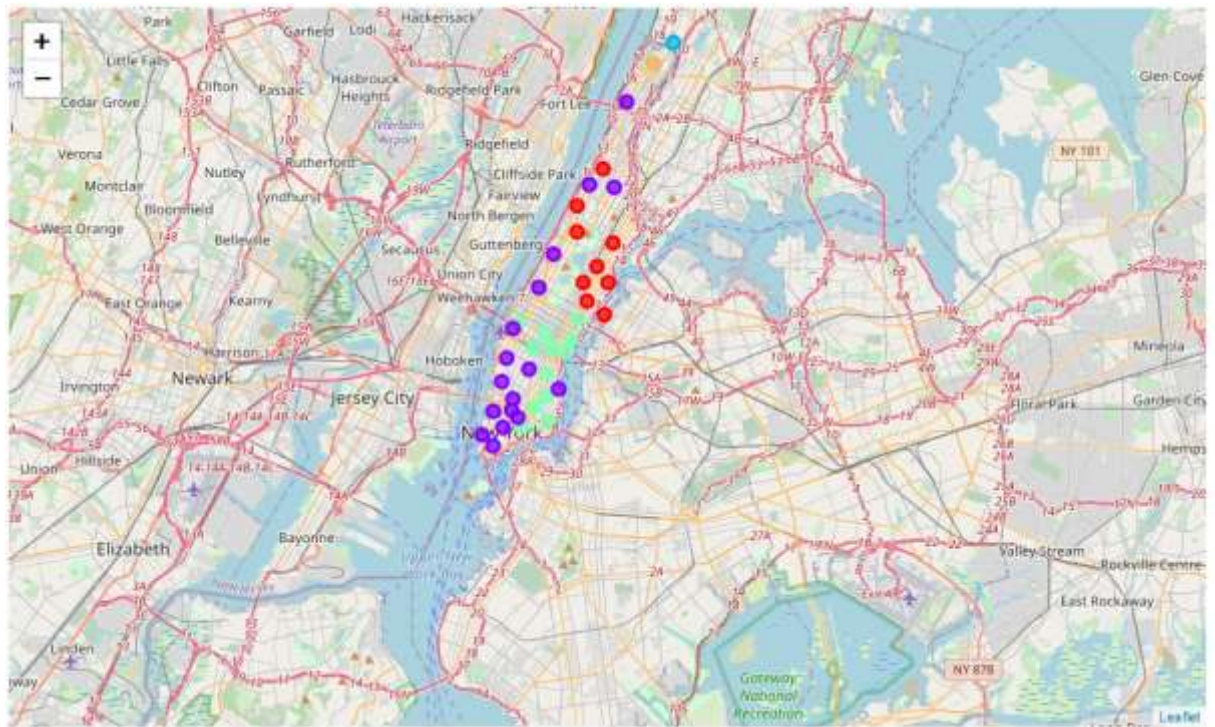


	Neighborhood	Neighborhood Latitude	Neighborhood Longitude		Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.910660	Empire Chinese And Japanese Cuisine	40.878588	-73.917446	Japanese Restaurant	
1	Marble Hill	40.876551	-73.910660	Sushikawa Restaurant	40.887341	-73.906967	Japanese Restaurant	
2	Marble Hill	40.876551	-73.910660	Planet Tokyo	40.886233	-73.909479	Sushi Restaurant	
3	Marble Hill	40.876551	-73.910660	Palace of Japan	40.885841	-73.910064	Japanese Restaurant	
4	Marble Hill	40.876551	-73.910660	Aoyu Japanese Restaurant	40.886257	-73.909719	Japanese Restaurant	
5	Chinatown	40.715618	-73.994279	Shinka Ramen & Sake Bar	40.717147	-73.995206	Japanese Restaurant	
6	Chinatown	40.715618	-73.994279	Tofu Tofu	40.717605	-73.995304	Korean Restaurant	
7	Chinatown	40.715618	-73.994279	Kissaki	40.725372	-73.991847	Sushi Restaurant	
8	Chinatown	40.715618	-73.994279	Shōji	40.717582	-74.005592	Sushi Restaurant	
9	Chinatown	40.715618	-73.994279	Kintsugi	40.722969	-74.004620	Sushi Restaurant	

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

Visualization using folium:



4. Results

Clusters with the less number of japanese restaurant:

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 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

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

The best locations are cluster 2 and 4 for the Japanese restaurant

5. 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,...)

6. 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