Traditional Japanese Restaurant in USA

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Introduction

My best friend "Aya", the young Japanese lady just graduated from university have plan to marry with her partner and will be moved to New York City after married because her partner working there as a business man. Aya has her dream to open up her own Japanese restaurant and this is a chance to open her own restaurant in the amazing place New York City!

Business Problem

Aya doesn't have any idea because she doesn't know anything about New York. The important thing she has to do is exploring about New York before doing her Business Plan.

Describe the data that will be using to execute the idea

For this project I plan to use the Foursquare location data to execute my idea for Aya to suggest her where is the best area of New York city she should open her Japanese restaurant.

Based on definition of my idea, factors that will influence my decission are:

- the type of common area in the neighborhood (any type)

- find out there are any Japanese restaurants in the neighborhood (if any)

- distance of neighborhood from city center I decided to use regularly spaced grid of locations,   centered around city center, to define our neighborhoods.

Following data sources will be needed to extract/generate the required information:

- Centers of candidate areas will be generated algorithmically and approximate addresses of   centers of those areas will be obtained using New York Data that already used by previous lab.

- Number of restaurants and their type and location in every neighborhood will be obtained   using Foursquare API
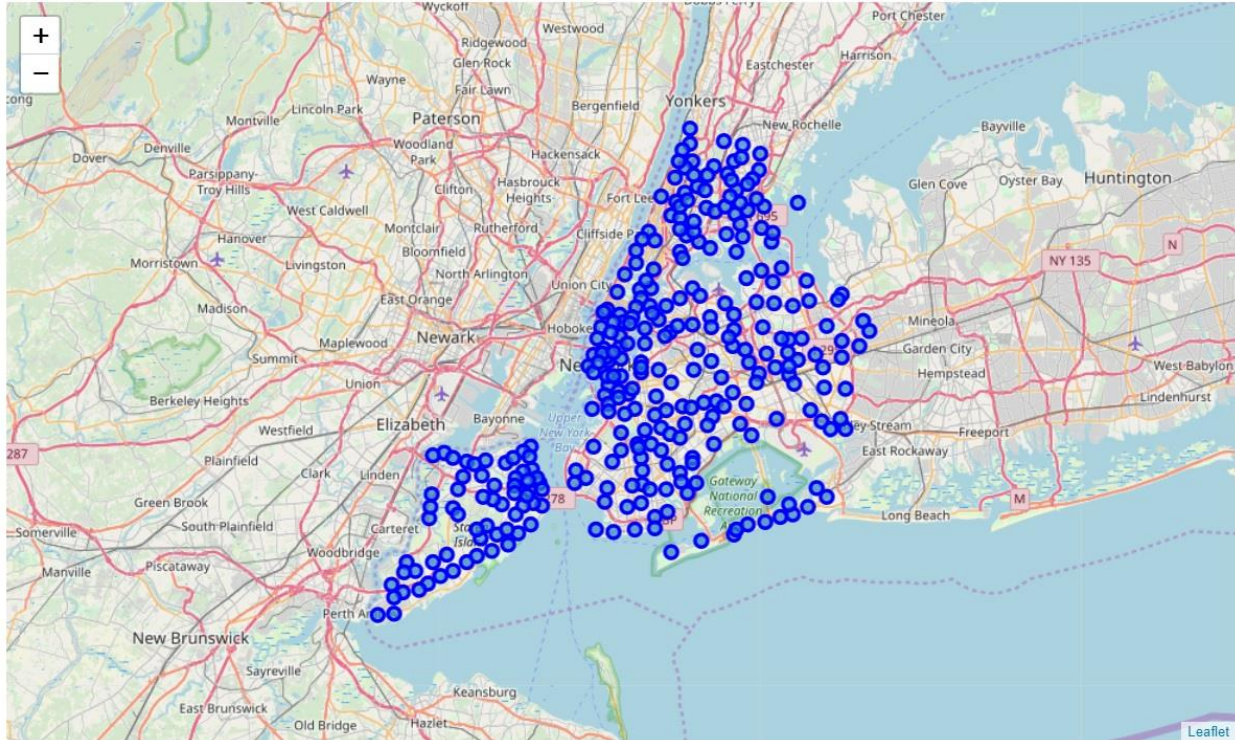
Neighborhood Candidates

Create latitude & longitude coordinates for centroids of candidate neighborhoods.

- first, I will explore the New York City

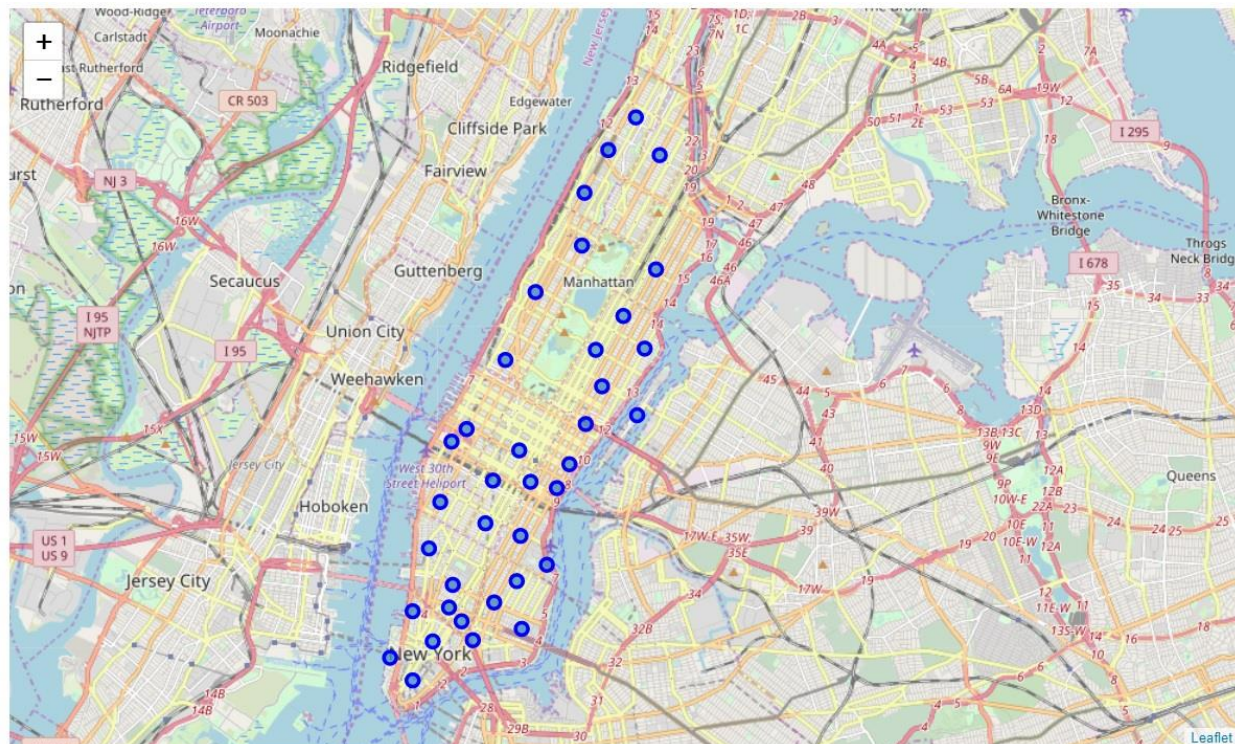- then explore Manhattan, the area that Aya's partner house is located in.

First, download New York dataset and convert to data frame

	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

Then, create a map of New York with neighborhoods superimposed on top

However, Aya's partner's home is located in Manhattan so I will scope only in Manhattan

Next, utilizing the Foursquare API to explore the neighborhoods and segment them

	name	categories	lat	lng
0	Kingsbridge Social Club	Pizza Place	40.884545	-73.901964
1	Inwood Hill Park	Park	40.870858	-73.920129
2	ChocNYC	Bakery	40.868396	-73.918742
3	Inwood Farmers Market	Farmers Market	40.869062	-73.920560
4	Bronx Alehouse	Beer Bar	40.884749	-73.899699

I Search the popular area by distance not over 20 km from the center of Manhattan, 100 venues were returned by Foursquare.

Explore Neighborhoods in Manhattan

The below are all neighborhood located in Manhattan

- Marble Hill

- Chinatown

- Washington Heights

- Inwood

- Hamilton Heights

- Manhattanville

- Central Harlem

- East Harlem

- Upper East Side

- Yorkville

- Lenox Hill

- Roosevelt Island

- Upper West Side

- Lincoln Square

- Clinton

- Midtown

- Murray Hill

- Chelsea

- Greenwich Village

- East Village

- Lower East Side

- Tribeca

- Little Italy

- Soho

- West Village

- Manhattan Valley

- Morningside Heights

- Gramercy

- Battery Park City

- Financial District

- Carnegie Hill

- Noho

- Civic Center

- Midtown South

- Sutton Place

- Turtle Bay

- Tudor City

- Stuyvesant Town

- Flatiron

- Hudson Yards

The dataframe will be like this

	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

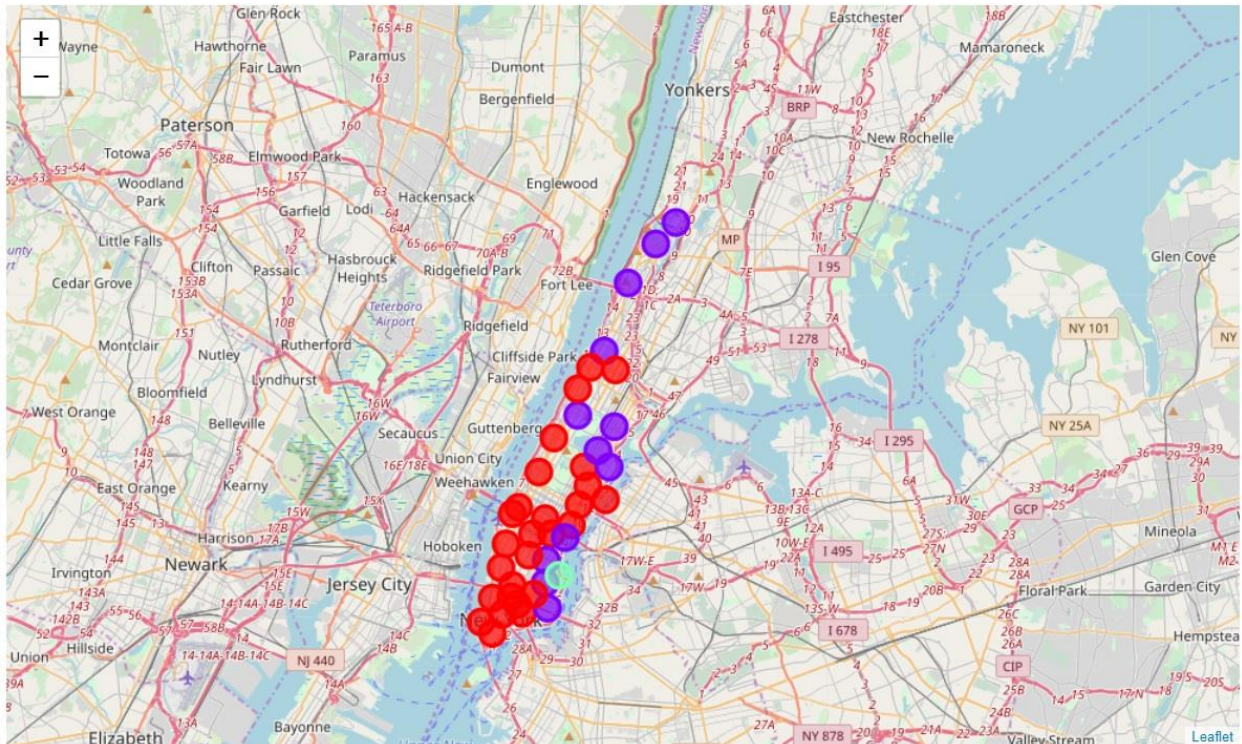As I drop the duplicate categories, there are 334 uniques categories in Manhattan.

Then, Create the new data frame and display the top 5 venues for each neighborhood

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Battery Park City	Park	Coffee Shop	Hotel	Memorial Site	Gym
1	Carnegie Hill	Coffee Shop	Pizza Place	Café	Yoga Studio	Japanese Restaurant
2	Central Harlem	Chinese Restaurant	African Restaurant	American Restaurant	Bar	Cosmetics Shop
3	Chelsea	Coffee Shop	Ice Cream Shop	Bakery	Italian Restaurant	Nightclub
4	Chinatown	Chinese Restaurant	Cocktail Bar	American Restaurant	Salon / Barbershop	Bakery

Cluster Neighborhood

I was run k-means to cluster the neighborhood into 3 clusters.

The plotted map is below.

Cluster 1

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
1	Chinatown	Chinese Restaurant	Cocktail Bar	American Restaurant	Salon / Barbershop	Bakery
5	Manhattanville	Coffee Shop	Italian Restaurant	Seafood Restaurant	Mexican Restaurant	Park
6	Central Harlem	Chinese Restaurant	African Restaurant	American Restaurant	Bar	Cosmetics Shop
8	Upper East Side	Italian Restaurant	Exhibit	Bakery	Art Gallery	Coffee Shop
10	Lenox Hill	Italian Restaurant	Coffee Shop	Pizza Place	Sushi Restaurant	Burger Joint
11	Roosevelt Island	Park	Sandwich Place	Coffee Shop	Outdoors & Recreation	School
12	Upper West Side	Italian Restaurant	Bar	Wine Bar	Coffee Shop	Cosmetics Shop
13	Lincoln Square	Theater	Café	Gym / Fitness Center	Concert Hall	Italian Restaurant
14	Clinton	Theater	Gym / Fitness Center	American Restaurant	Italian Restaurant	Wine Shop
15	Midtown	Hotel	Sporting Goods Shop	Theater	Clothing Store	Coffee Shop
16	Murray Hill	Coffee Shop	Sandwich Place	Japanese Restaurant	Hotel	Italian Restaurant
17	Chelsea	Coffee Shop	Ice Cream Shop	Bakery	Italian Restaurant	Nightclub
18	Greenwich Village	Italian Restaurant	Sushi Restaurant	Clothing Store	Indian Restaurant	French Restaurant
21	Tribeca	Park	Italian Restaurant	Café	Spa	American Restaurant
22	Little Italy	Italian Restaurant	Bakery	Café	Salon / Barbershop	Sandwich Place
23	Soho	Clothing Store	Boutique	Art Gallery	Shoe Store	Furniture / Home Store
24	West Village	Italian Restaurant	New American Restaurant	Cosmetics Shop	Park	American Restaurant
26	Morningside Heights	Bookstore	American Restaurant	Coffee Shop	Park	Burger Joint
28	Battery Park City	Park	Coffee Shop	Hotel	Memorial Site	Gym
29	Financial District	Coffee Shop	Wine Shop	Hotel	American Restaurant	Pizza Place
31	Noho	Italian Restaurant	Cocktail Bar	Art Gallery	French Restaurant	Mexican Restaurant
32	Civic Center	Gym / Fitness Center	French Restaurant	Hotel	Coffee Shop	Italian Restaurant
33	Midtown South	Korean Restaurant	Hotel	Hotel Bar	Japanese Restaurant	Cosmetics Shop
34	Sutton Place	Gym / Fitness Center	Indian Restaurant	Italian Restaurant	Furniture / Home Store	American Restaurant
35	Turtle Bay	Italian Restaurant	Wine Bar	Steakhouse	Sushi Restaurant	Ramen Restaurant
38	Flatiron	Gym / Fitness Center	Yoga Studio	Gym	American Restaurant	Japanese Restaurant
39	Hudson Yards	American Restaurant	Italian Restaurant	Café	Gym / Fitness Center	Hotel

Cluster 2

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Marble Hill	Sandwich Place	Coffee Shop	Yoga Studio	Deli / Bodega	Supplement Shop
2	Washington Heights	Mobile Phone Shop	Bakery	Café	Grocery Store	Bank
3	Inwood	Mexican Restaurant	Café	Pizza Place	Lounge	Pharmacy
4	Hamilton Heights	Pizza Place	Café	Mexican Restaurant	Deli / Bodega	Coffee Shop
7	East Harlem	Mexican Restaurant	Deli / Bodega	Bakery	Latin American Restaurant	Thai Restaurant
9	Yorkville	Italian Restaurant	Gym	Coffee Shop	Pizza Place	Bar
19	East Village	Bar	Wine Bar	Ice Cream Shop	Chinese Restaurant	Cocktail Bar
20	Lower East Side	Pizza Place	Café	Cocktail Bar	Chinese Restaurant	Japanese Restaurant
25	Manhattan Valley	Coffee Shop	Bar	Indian Restaurant	Pizza Place	Deli / Bodega
27	Gramercy	Bar	Italian Restaurant	American Restaurant	Bagel Shop	Pizza Place
30	Carnegie Hill	Coffee Shop	Pizza Place	Café	Yoga Studio	Japanese Restaurant
36	Tudor City	Café	Park	Mexican Restaurant	Greek Restaurant	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
37	Stuyvesant Town	Boat or Ferry	Park	Bar	Heliport	Tennis Court

Results and Discussion

This analysis shows about 3 groups of area around Manhattan, New York, USA. Each cluster groups show the top 5 common venue of each area to bring the idea which area Aya should open her Japanese restaurant.

Result of all this is 40 area containing largest number of potential new restaurant locations based on number of ranking of each area. Cluster 1 is the popular location and contain the large rating of restaurant-categories. Cluster 2 is also contain

rating of restaurant-categories, but mostly are light meal or beverages. Cluster 3 is no contain any restaurant type.

If I would recommend Aya, I will suggest the area in Cluster 1 to open her restaurant.

Conclusion

Purpose of this project is to recommend Aya to open her Japanese restaurant in the right place! As you can see on the result of each cluster, the area in cluster 3 "Stuyvesant Town" is very near from her partner's house. If she thinks only where is the most convenience for her to take care the restaurant, she may choose the nearest one! And she might loss the potential to run the business and she will get loss for sure.

Finally, I would like to suggest her to survey the area that will open the restaurant by herself. Those area are including

Chinatown

Manhattanville

Central Harlem

Upper East Side

Lenox Hill

Roosevelt Island

Upper West Side

Lincoln Square

Clinton

Midtown

Murray Hill

Chelsea

Greenwich Village

Tribeca

Little Italy

Soho

West Village

Morningside Heights

Battery Park City

Financial District

Noho

Midtown South

Civic Center

Sutton Place

Turtle Bay

Flatiron

Hudson Yards

Remark, This is the result of the area that I _limited the distance not over 20 km from the center of Manhattan_.