OPENING A NEW JAPANESE RESTAURANT IN MANHATTAN AND QUEENS, NEW YORK CITY

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INTRODUCTION: BUSINESS PROBLEM

- Open a new Japanese restaurant is becoming the planned business plan in New York City, and this final project explores the possible neighborhoods to start new Japanese restaurants throughout the Queens and Manhattan, because these two boroughs are having taste food from around the globe, people are more likely to explore delicacy here.
- Leveraging the Foursquare location data to find numbers of popular or people favored Japanese restaurants for each neighborhood in Queens and Manhattan.
- By combing the numbers of favored Japanese Restaurants and clustered restaurants, recommend the possible neighborhoods to open a new Japanese restaurant.

DATA

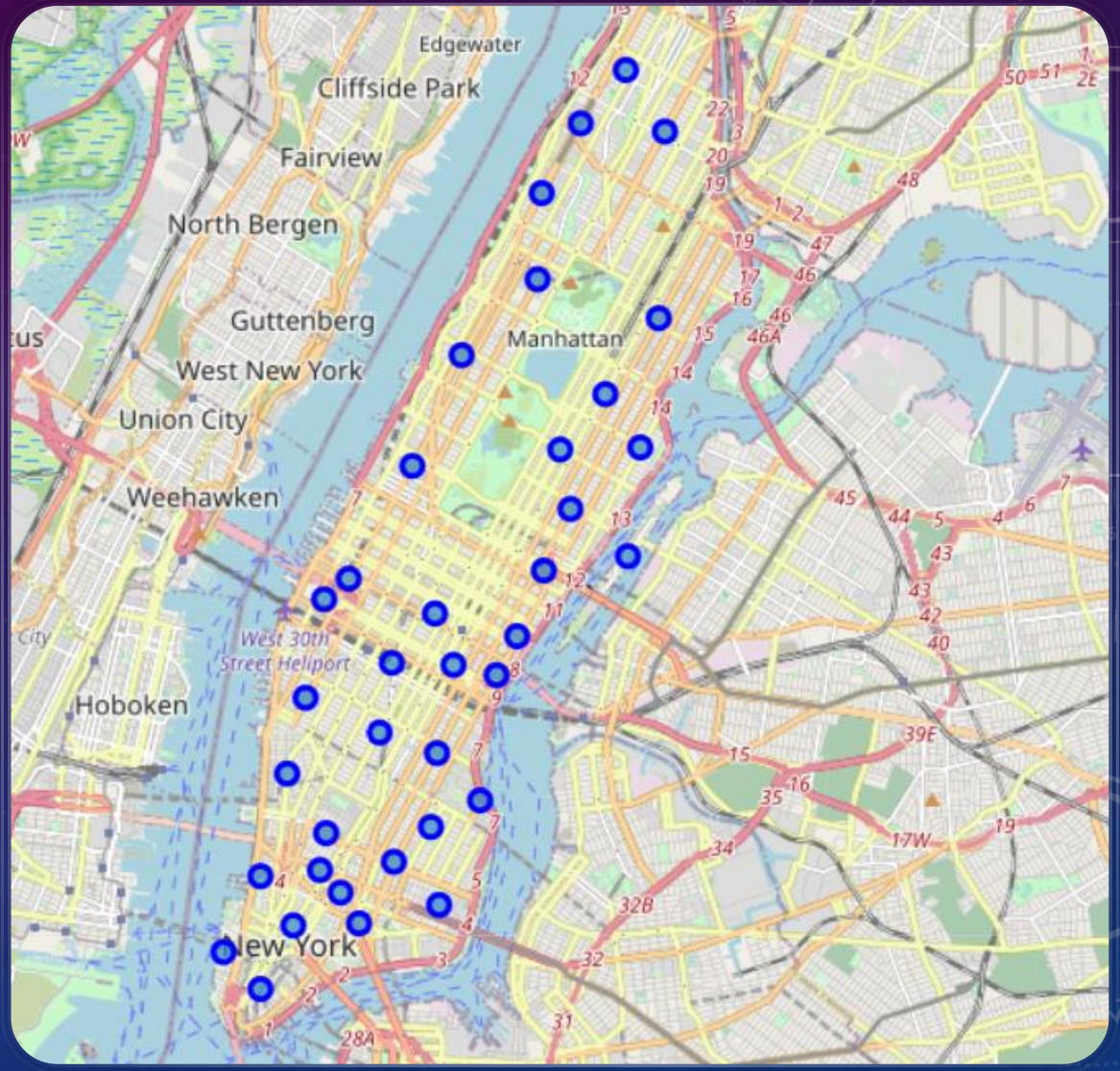
- Data Downloaded from:

https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-DS0701EN-SkillsNetwork/labs/newyork_data.json

- By using this API, I will get all the venues in the Queens and Manhattan's neighborhood. I can filter these venues to get all type of restaurants. Given the geographic coordinates of each neighborhoods, the project explores the popular venues in each neighborhood using Foursquares API. The venues information dataset will be leveraged to analyze the business problem.

METHODOLOGY

- Group by neighborhood and check the mean of the frequency of occurrence of Japanese restaurant.
  - I rely on the API to call the top 100 venues with a radius 500 meters for each neighborhood.
  - 3,225 top venues data points available within a radius 500 meters for each neighborhood in Manhattan
  - There is total 329 unique venue category in Manhattan
  - Filter the Japanese restaurant as venue category for each neighborhood and display the frequency of occurrence of Japanese restaurant as venue category in each neighborhood, and sort it by descending order

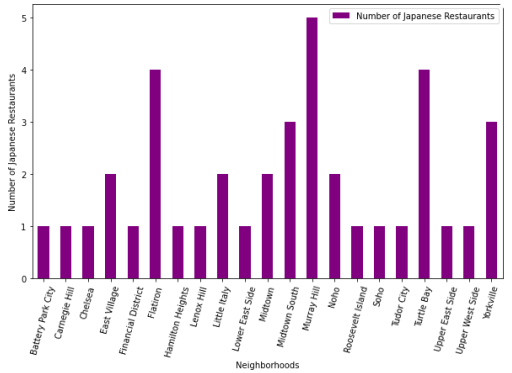


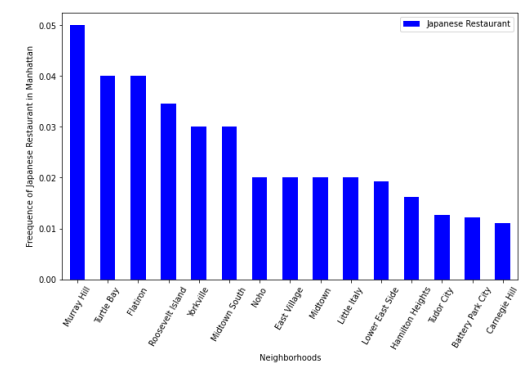
METHODOLOGY

- I suggest to open restaurants in neighborhoods **Lincoln Square** and **Manhattan Valley**, both neighborhoods are on the northwestward of the central park and close to the central park.

Neighborhood	Japanese Restaurant
Murray Hill	0.050000
Turtle Bay	0.040000
Flatiron	0.040000
Roosevelt Island	0.034483
Yorkville	0.030000
Midtown South	0.030000
Noho	0.020000
East Village	0.020000
Midtown	0.020000
Little Italy	0.020000
Lower East Side	0.019231
Hamilton Heights	0.016129
Tudor City	0.012658
Battery Park City	0.012195
Carnegie Hill	0.011111

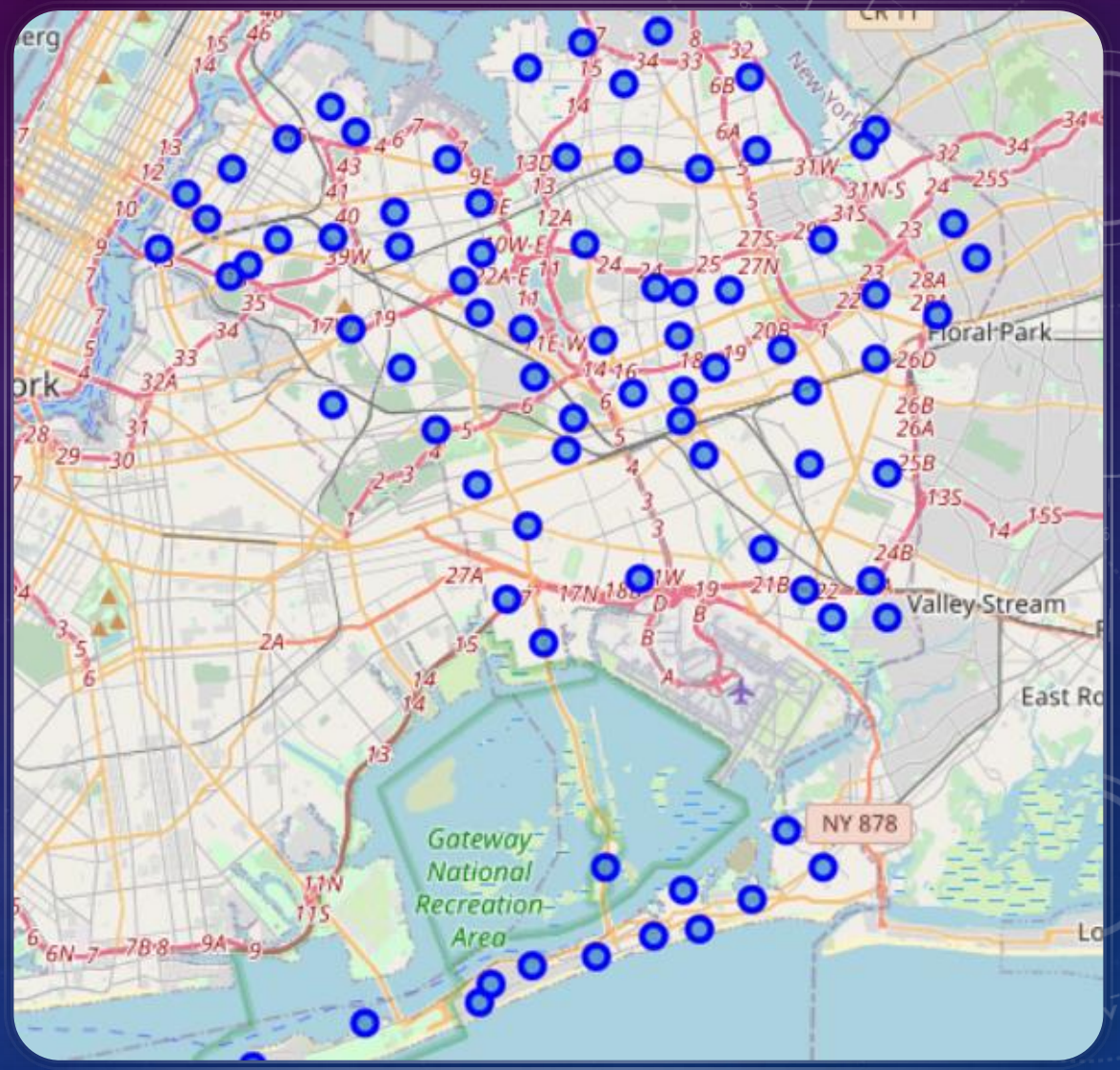
Neighborhood	Japanese Restaurant
Tribeca	0.0
Sutton Place	0.0
Stuyvesant Town	0.0
Civic Center	0.0
Chinatown	0.0
Inwood	0.0
Clinton	0.0
Morningside Heights	0.0
East Harlem	0.0
Marble Hill	0.0
Manhattanville	0.0
Gramercy	0.0
Greenwich Village	0.0
Lincoln Square	0.0
Manhattan Valley	0.0





METHODOLOGY

- Queens has 81 neighborhoods.
- Queens has 2,103 top venues within each neighborhood, on average, each neighborhood has about 25 popular venues to be recorded in Foursquares API.
- 275 unique venue category in Queens.

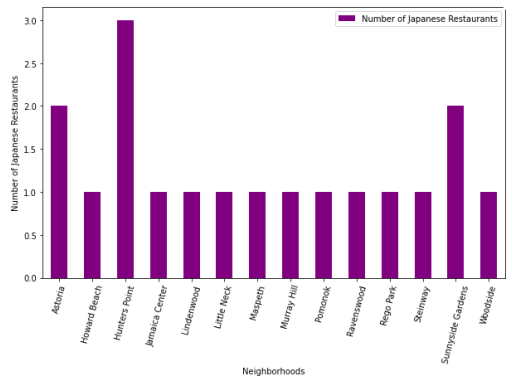


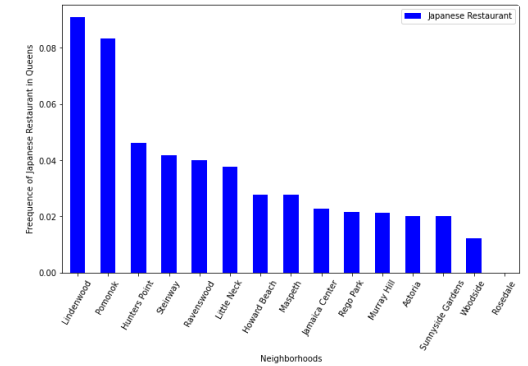
METHODOLOGY

- Suggest to open restaurants in neighborhoods **Jackson Height, Forest Hills, Flushing and Elmhurst,** these neighborhoods are close to the center of Queens and easy to visit after existing the freeways.

Neighborhood	Japanese Restaurant
Pomonok	0.100000
Lindenwood	0.090909
Hunters Point	0.045455
Steinway	0.043478
Ravenswood	0.040000
Maspeth	0.029412
Howard Beach	0.028571
Jamaica Center	0.022222
Rego Park	0.021739
Murray Hill	0.021277
Astoria	0.020000
Sunnyside Gardens	0.020000
Little Neck	0.018519
Woodside	0.012821
Rosedale	0.000000

Neighborhood	Japanese Restaurant
Jackson Heights	0.0
Holliswood	0.0
Hollis	0.0
Hillcrest	0.0
Hammels	0.0
Glendale	0.0
Glen Oaks	0.0
Fresh Meadows	0.0
Forest Hills Gardens	0.0
Forest Hills	0.0
Flushing	0.0
Floral Park	0.0
Far Rockaway	0.0
Elmhurst	0.0
Jamaica Hills	0.0





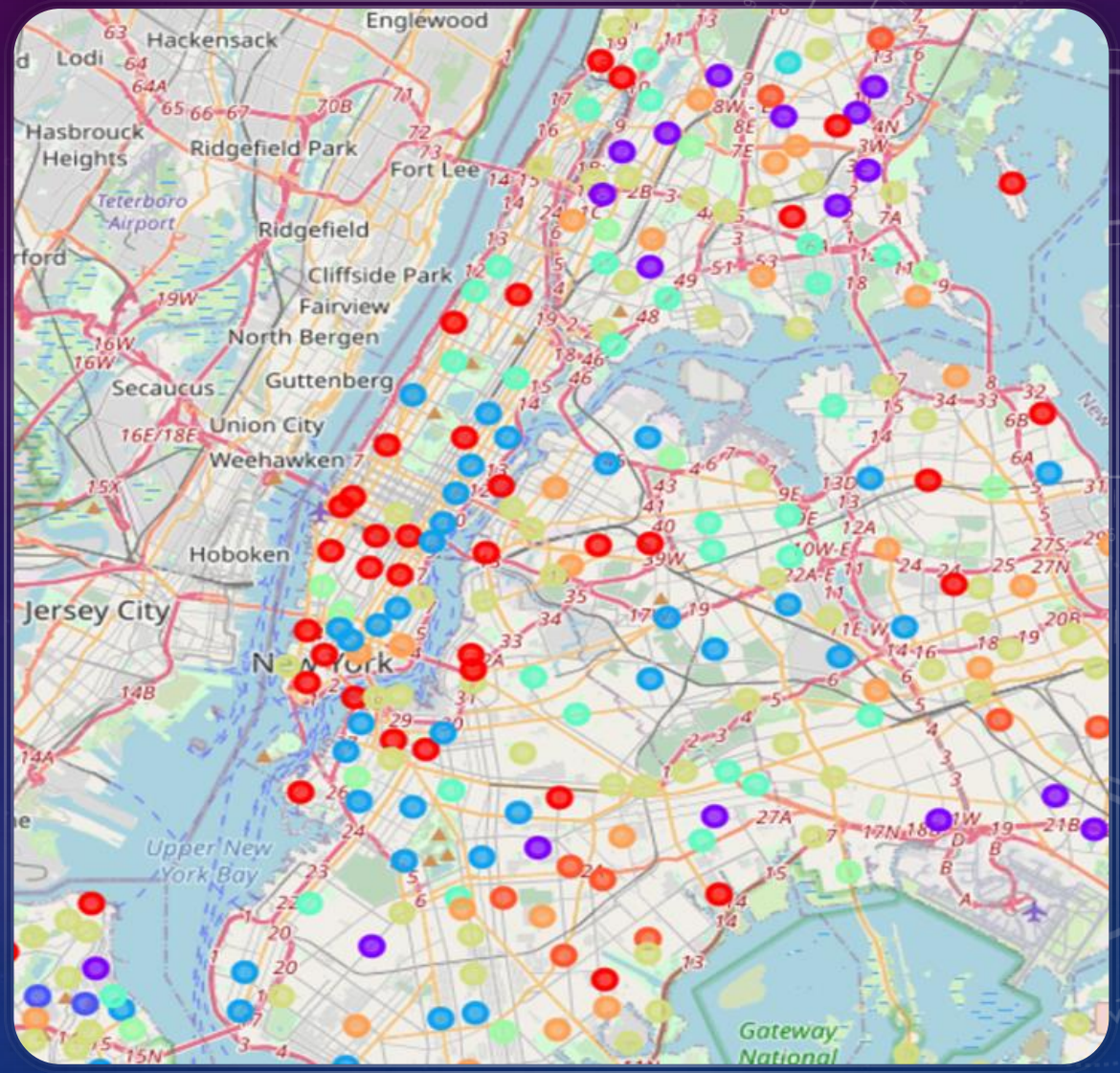
METHODOLOGY

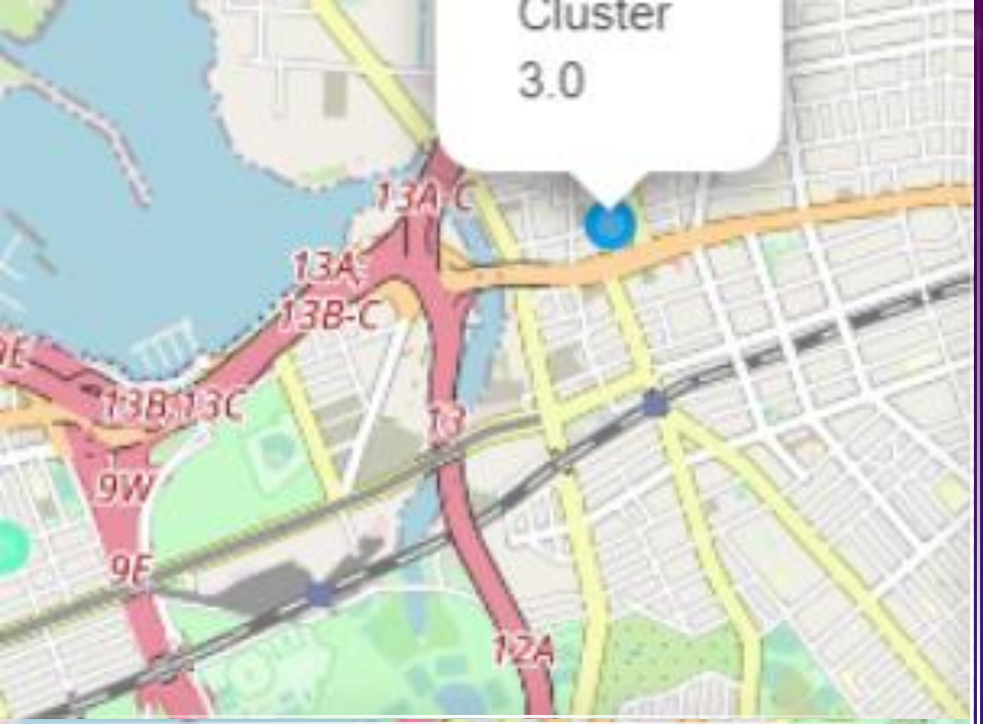
	Neighborhood	1st Most Common Type Restaurant	2nd Most Common Type Restaurant	3rd Most Common Type Restaurant	4th Most Common Type Restaurant	5th Most Common Type Restaurant	6th Most Common Type Restaurant	7th Most Common Type Restaurant	8th Most Common Type Restaurant	9th Most Common Type Restaurant	10th Most Common Type Restaurant
0	Allerton	Chinese Restaurant	Fast Food Restaurant	Spanish Restaurant	Scandinavian Restaurant	Russian Restaurant	Romanian Restaurant	Restaurant	Ramen Restaurant	Puerto Rican Restaurant	Polish Restaurant
1	Annadale	Restaurant	Sushi Restaurant	Afghan Restaurant	Paella Restaurant	Romanian Restaurant	Ramen Restaurant	Puerto Rican Restaurant	Polish Restaurant	Peruvian Restaurant	Persian Restaurant
2	Arden Heights	Afghan Restaurant	Paella Restaurant	Russian Restaurant	Romanian Restaurant	Restaurant	Ramen Restaurant	Puerto Rican Restaurant	Polish Restaurant	Peruvian Restaurant	Persian Restaurant
3	Arlington	American Restaurant	Afghan Restaurant	Paella Restaurant	Russian Restaurant	Romanian Restaurant	Restaurant	Ramen Restaurant	Puerto Rican Restaurant	Polish Restaurant	Peruvian Restaurant
4	Arrochar	Italian Restaurant	Mediterranean Restaurant	Middle Eastern Restaurant	Polish Restaurant	Afghan Restaurant	Pakistani Restaurant	Russian Restaurant	Romanian Restaurant	Restaurant	Ramen Restaurant

- **K-means Cluster Analysis**
  - 10,106 popular venues in the New York City, and 437 unique venue categories. Then I find out the columns' names having string "restaurant" to filter out all type of restaurants, the total types of restaurants in the New York City are 93, for examples, Afghan Restaurants, African Restaurant, American Restaurants, Asian Restaurant and so on.
  - top 10 most common type restaurants in each neighborhood. The Japanese restaurant is not very popular in each neighborhood compared with other types.
  - K-means cluster model to segmenting the neighborhoods having similar favored type restaurants, the K is set up to 10.

METHODOLOGY

- Combining with the previous numbers of restaurants and frequency of occurrence analysis, I conclude that best location for a Japanese restaurant in Manhattan is the **neighborhoods between Lincoln Square and Manhattan Valley**, because upper west neighborhood in included in the cluster 3 and is in the middle of Lincoln Square and Manhattan Valley.





RESULTS

- If we only look at the numbers of restaurants or the frequency of occurrence of venue category. the Lincoln Square and Manhattan Valley are possible neighborhoods to open new Japanese restaurant if considering the competition, location, and surrounding point of interests in Manhattan. Jackson Height, Forest Hills, Flushing, and Elmhurst are possible best neighborhoods in Queens to open new Japanese restaurants, since they are in the center of queens, and the location is conveniently accessible.
- if we refer to the K-means cluster results, the best place to open Japanese restaurant in Manhattan is still the neighborhoods between Lincoln Square and Manhattan Valley. The best neighborhood in Queens is flushing. The cluster analysis provides some further analysis on how much people like a certain type of food in a given neighborhood.

DISCUSSION

- A number of shortcomings:
  - adding some other social economic data, demographic data in each neighborhood, social economic data like income, education may affect people's choice on food types. The population in each neighborhood may affect the business profits. Other factor, such as, whether neighborhood is a business-based region or not, traffic conditions, public transportation may affect the results.

CONCLUSION

- The project explores the possible neighborhoods to start new Japanese restaurants throughout the Queens and Manhattan, because these two boroughs are having taste food from around the globe, people are more likely to explore delicacy here.
- The project uses the Foursquare location data to find numbers of popular or people favored Japanese restaurants for each neighborhood in Queens and Manhattan, looks at the Japanese restaurants' frequency in venue category for each neighborhood in Queens and Manhattan.
- The project assumes that the neighborhood with larger number of favored Japanese restaurants are not optimal choice for opening a new Japanese restaurant become the competition in these neighborhoods could be fierce.
- The project implements K-means clusters model to have a cluster analysis on types of venue category with string 'Restaurant', the cluster results will indicate the similar neighborhoods and ranking of types of food in these neighborhoods.
- By combing the numbers of favored Japanese Restaurants and clustered restaurants, the project will suggest the possible neighborhoods to open a new Japanese restaurant are the neighborhoods between Lincoln Square and Manhattan Valley in Manhattan, Flushing in Queens.