

The background of the slide features a large, bright yellow geometric shape on the right side, composed of several triangles and quadrilaterals that create a dynamic, abstract pattern. The rest of the background is white.

# **Capstone Project Battle of Neighborhoods**

**SELECTING THE BEST LOCATION TO OPEN INDONESIAN RESTAURANT IN NEW YORK**

# Introduction/Business Problem

- New York City is a multicultural place where different kinds of dishes can be found especially for western cuisine..
- There seems to be a gap in the culinary industry where there might be a potential for Indonesian food.
- Indonesian food has not been marketed really well compare to other Asian food such as Japanese, Korean, Chinese, Thai, etc.

# Data Selection

|   | Neighborhood | Neighborhood Latitude | Neighborhood Longitude | Venue                    | Venue Latitude | Venue Longitude | Venue Category     |
|---|--------------|-----------------------|------------------------|--------------------------|----------------|-----------------|--------------------|
| 0 | Marble Hill  | 40.876551             | -73.91066              | China Wang               | 40.874347      | -73.910540      | Chinese Restaurant |
| 1 | Marble Hill  | 40.876551             | -73.91066              | Mei Chung Mei Restaurant | 40.878272      | -73.902981      | Chinese Restaurant |
| 2 | Marble Hill  | 40.876551             | -73.91066              | Anise                    | 40.885989      | -73.910036      | Chinese Restaurant |
| 3 | Marble Hill  | 40.876551             | -73.91066              | Kam Wah Kitchen          | 40.876084      | -73.908698      | Asian Restaurant   |
| 4 | Marble Hill  | 40.876551             | -73.91066              | Moon Star Grill          | 40.886238      | -73.909961      | Asian Restaurant   |

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newyork_venues_asian.shape
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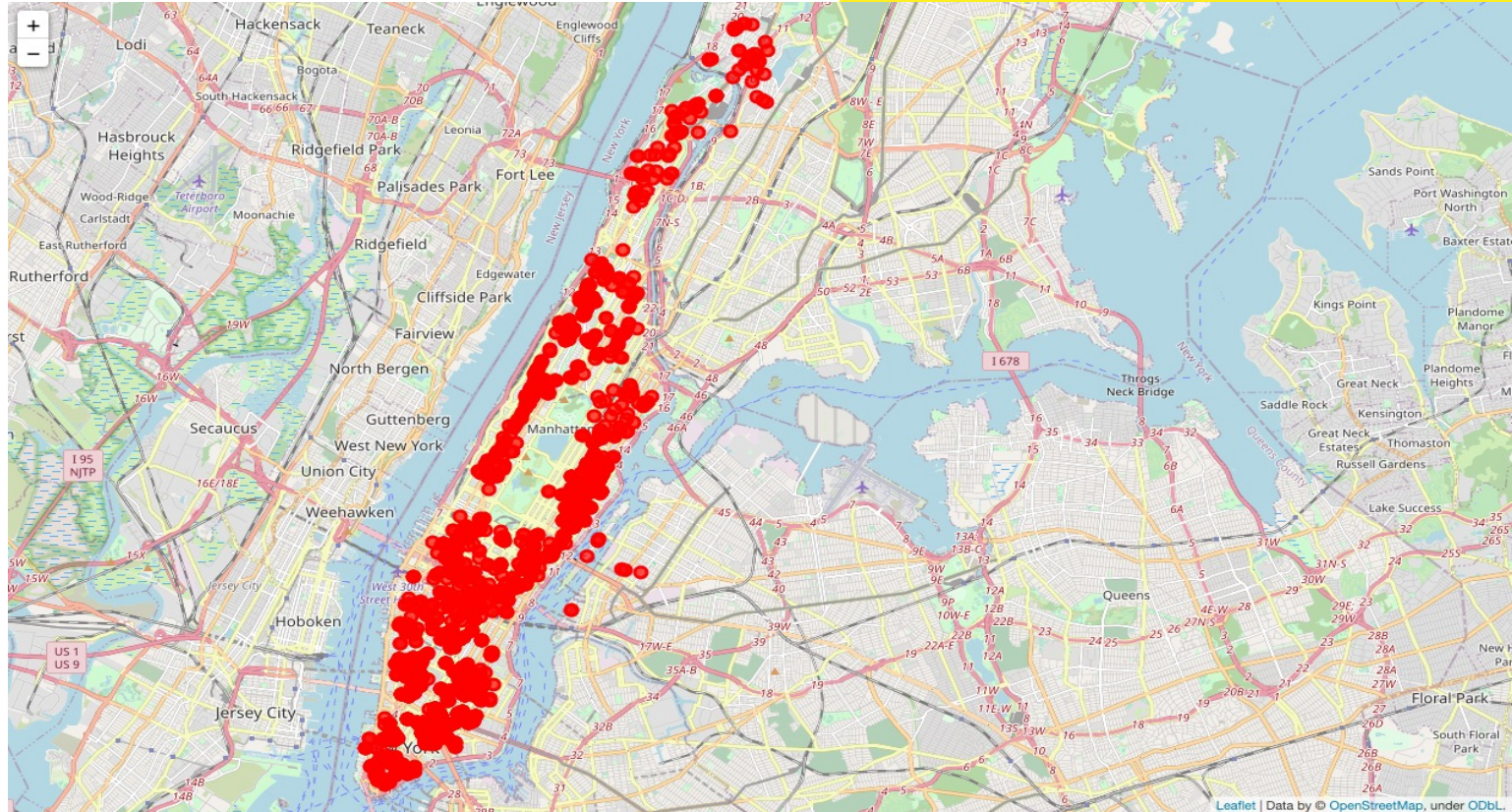
→ Currently there are almost two thousands Asian restaurants in Manhattan

# Methodology

- Addresses are converted into their equivalent latitude and longitude values.
- Foursquare API is used to explore neighbourhoods in Manhattan, New York.
- After that, explore function to get Asian restaurant categories in each neighbourhood.

|   | Neighborhood | Asian Restaurant | Bakery | Beer Bar | Burger Joint | Café | Cantonese Restaurant | Cha Chaan Teng | Chinese Restaurant | Cocktail Bar | Coffee Shop | Cuban Restaurant | Deli / Bodega | Dim Sum Restaurant | Dumpling Restaurant | Filipino Restaurant | Fish Market | Food & Drink Shop | F |
|---|--------------|------------------|--------|----------|--------------|------|----------------------|----------------|--------------------|--------------|-------------|------------------|---------------|--------------------|---------------------|---------------------|-------------|-------------------|---|
| 0 | Marble Hill  | 0                | 0      | 0        | 0            | 0    | 0                    | 0              | 1                  | 0            | 0           | 0                | 0             | 0                  | 0                   | 0                   | 0           | 0                 | 0 |
| 1 | Marble Hill  | 0                | 0      | 0        | 0            | 0    | 0                    | 0              | 1                  | 0            | 0           | 0                | 0             | 0                  | 0                   | 0                   | 0           | 0                 | 0 |
| 2 | Marble Hill  | 0                | 0      | 0        | 0            | 0    | 0                    | 0              | 1                  | 0            | 0           | 0                | 0             | 0                  | 0                   | 0                   | 0           | 0                 | 0 |
| 3 | Marble Hill  | 1                | 0      | 0        | 0            | 0    | 0                    | 0              | 0                  | 0            | 0           | 0                | 0             | 0                  | 0                   | 0                   | 0           | 0                 | 0 |
| 4 | Marble Hill  | 1                | 0      | 0        | 0            | 0    | 0                    | 0              | 0                  | 0            | 0           | 0                | 0             | 0                  | 0                   | 0                   | 0           | 0                 | 0 |

# Methodology



# Methodology

Then using this feature to group the neighbourhoods into clusters K-means clustering algorithm will be use to complete this task. And also, the Folium library to visualize the neighbourhoods in Manhattan and its emerging clusters.

|   | 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 | Sushi Restaurant      | Japanese Restaurant   | Chinese Restaurant    | Thai Restaurant       | Korean Restaurant     |
| 1 | Carnegie Hill     | Sushi Restaurant      | Thai Restaurant       | Chinese Restaurant    | Japanese Restaurant   | Vietnamese Restaurant |
| 2 | Central Harlem    | Chinese Restaurant    | Japanese Restaurant   | Thai Restaurant       | Sushi Restaurant      | Asian Restaurant      |
| 3 | Chelsea           | Japanese Restaurant   | Sushi Restaurant      | Thai Restaurant       | Chinese Restaurant    | Ramen Restaurant      |
| 4 | Chinatown         | Chinese Restaurant    | Sushi Restaurant      | Vietnamese Restaurant | Dim Sum Restaurant    | Asian Restaurant      |

# Result

## Cluster 0

|    | Neighborhood       | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue |
|----|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 12 | Upper West Side    | Sushi Restaurant      | Chinese Restaurant    | Japanese Restaurant   | Thai Restaurant       | Asian Restaurant      |
| 13 | Lincoln Square     | Thai Restaurant       | Sushi Restaurant      | Japanese Restaurant   | Ramen Restaurant      | Vietnamese Restaurant |
| 14 | Clinton            | Thai Restaurant       | Ramen Restaurant      | Japanese Restaurant   | Sushi Restaurant      | Chinese Restaurant    |
| 17 | Chelsea            | Japanese Restaurant   | Sushi Restaurant      | Thai Restaurant       | Chinese Restaurant    | Ramen Restaurant      |
| 19 | East Village       | Japanese Restaurant   | Korean Restaurant     | Ramen Restaurant      | Sushi Restaurant      | Vietnamese Restaurant |
| 24 | West Village       | Sushi Restaurant      | Chinese Restaurant    | Japanese Restaurant   | Thai Restaurant       | Noodle House          |
| 28 | Battery Park City  | Sushi Restaurant      | Japanese Restaurant   | Chinese Restaurant    | Thai Restaurant       | Korean Restaurant     |
| 29 | Financial District | Sushi Restaurant      | Japanese Restaurant   | Chinese Restaurant    | Thai Restaurant       | Food Truck            |
| 34 | Sutton Place       | Japanese Restaurant   | Chinese Restaurant    | Sushi Restaurant      | Asian Restaurant      | Ramen Restaurant      |
| 35 | Turtle Bay         | Japanese Restaurant   | Chinese Restaurant    | Thai Restaurant       | Ramen Restaurant      | Sushi Restaurant      |
| 37 | Stuyvesant Town    | Sushi Restaurant      | Ramen Restaurant      | Korean Restaurant     | Thai Restaurant       | Japanese Restaurant   |
| 39 | Hudson Yards       | Chinese Restaurant    | Thai Restaurant       | Ramen Restaurant      | Sushi Restaurant      | Japanese Restaurant   |

# Result

## Cluster 1

|   | Neighborhood       | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue     |
|---|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------------|
| 0 | Marble Hill        | Chinese Restaurant    | Asian Restaurant      | Japanese Restaurant   | Thai Restaurant       | Korean Restaurant         |
| 2 | Washington Heights | Chinese Restaurant    | Asian Restaurant      | Thai Restaurant       | Sushi Restaurant      | Ramen Restaurant          |
| 3 | Inwood             | Chinese Restaurant    | Thai Restaurant       | Sushi Restaurant      | Asian Restaurant      | Dumpling Restaurant       |
| 4 | Hamilton Heights   | Chinese Restaurant    | Thai Restaurant       | Sushi Restaurant      | Japanese Restaurant   | Cocktail Bar              |
| 5 | Manhattanville     | Chinese Restaurant    | Japanese Restaurant   | Sushi Restaurant      | Thai Restaurant       | Japanese Curry Restaurant |
| 6 | Central Harlem     | Chinese Restaurant    | Japanese Restaurant   | Thai Restaurant       | Sushi Restaurant      | Asian Restaurant          |
| 7 | East Harlem        | Chinese Restaurant    | Thai Restaurant       | Asian Restaurant      | Sushi Restaurant      | Hawaiian Restaurant       |



# Result

## Cluster 2

|    | Neighborhood  | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue |
|----|---------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 15 | Midtown       | Korean Restaurant     | Japanese Restaurant   | Sushi Restaurant      | Ramen Restaurant      | Thai Restaurant       |
| 16 | Murray Hill   | Korean Restaurant     | Japanese Restaurant   | Sushi Restaurant      | Chinese Restaurant    | Ramen Restaurant      |
| 27 | Gramercy      | Korean Restaurant     | Japanese Restaurant   | Ramen Restaurant      | Chinese Restaurant    | Asian Restaurant      |
| 33 | Midtown South | Korean Restaurant     | Japanese Restaurant   | Sushi Restaurant      | Asian Restaurant      | Ramen Restaurant      |
| 36 | Tudor City    | Korean Restaurant     | Japanese Restaurant   | Asian Restaurant      | Sushi Restaurant      | Ramen Restaurant      |
| 38 | Flatiron      | Korean Restaurant     | Japanese Restaurant   | Sushi Restaurant      | Thai Restaurant       | Chinese Restaurant    |

# Result

## Cluster 3

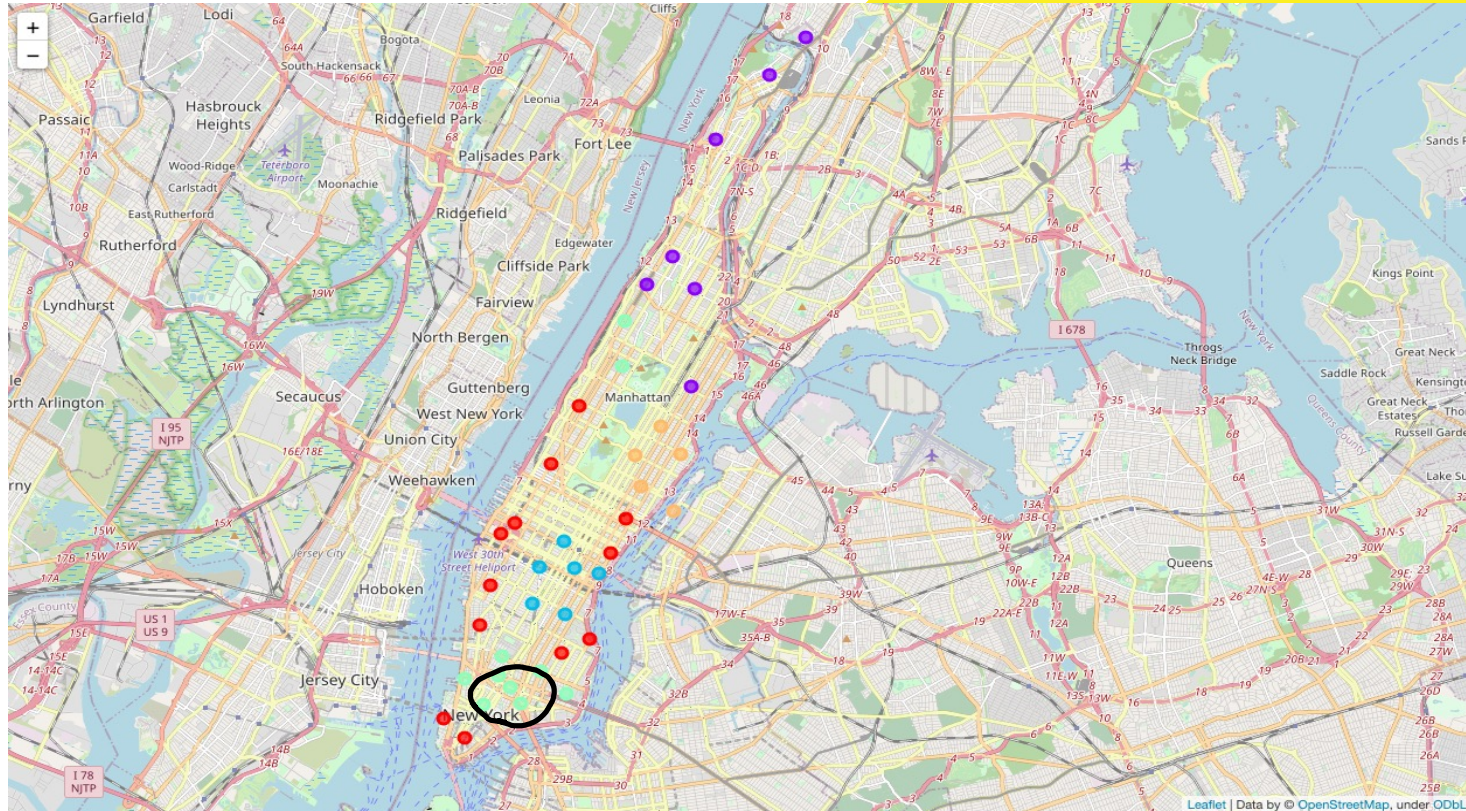
|    | Neighborhood        | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue |
|----|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1  | Chinatown           | Chinese Restaurant    | Sushi Restaurant      | Vietnamese Restaurant | Dim Sum Restaurant    | Asian Restaurant      |
| 18 | Greenwich Village   | Sushi Restaurant      | Japanese Restaurant   | Thai Restaurant       | Vietnamese Restaurant | Chinese Restaurant    |
| 20 | Lower East Side     | Korean Restaurant     | Chinese Restaurant    | Vietnamese Restaurant | Japanese Restaurant   | Sushi Restaurant      |
| 21 | Tribeca             | Chinese Restaurant    | Sushi Restaurant      | Vietnamese Restaurant | Japanese Restaurant   | Asian Restaurant      |
| 22 | Little Italy        | Chinese Restaurant    | Sushi Restaurant      | Asian Restaurant      | Dim Sum Restaurant    | Thai Restaurant       |
| 23 | Soho                | Sushi Restaurant      | Chinese Restaurant    | Asian Restaurant      | Thai Restaurant       | Vietnamese Restaurant |
| 25 | Manhattan Valley    | Chinese Restaurant    | Thai Restaurant       | Sushi Restaurant      | Asian Restaurant      | Noodle House          |
| 26 | Morningside Heights | Chinese Restaurant    | Thai Restaurant       | Asian Restaurant      | Sushi Restaurant      | Korean Restaurant     |
| 31 | Noho                | Sushi Restaurant      | Chinese Restaurant    | Vietnamese Restaurant | Korean Restaurant     | Thai Restaurant       |
| 32 | Civic Center        | Chinese Restaurant    | Asian Restaurant      | Vietnamese Restaurant | Noodle House          | Cha Chaan Teng        |

# Result

## Cluster 4

|    | Neighborhood     | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue |
|----|------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 8  | Upper East Side  | Sushi Restaurant      | Thai Restaurant       | Chinese Restaurant    | Japanese Restaurant   | Vietnamese Restaurant |
| 9  | Yorkville        | Sushi Restaurant      | Chinese Restaurant    | Thai Restaurant       | Japanese Restaurant   | Ramen Restaurant      |
| 10 | Lenox Hill       | Sushi Restaurant      | Thai Restaurant       | Japanese Restaurant   | Chinese Restaurant    | Asian Restaurant      |
| 11 | Roosevelt Island | Sushi Restaurant      | Chinese Restaurant    | Japanese Restaurant   | Thai Restaurant       | Asian Restaurant      |
| 30 | Carnegie Hill    | Sushi Restaurant      | Thai Restaurant       | Chinese Restaurant    | Japanese Restaurant   | Vietnamese Restaurant |

# Result



# Discussion

This analysis is performed on limited data. This may be right or may be wrong. But if good amount of data is available there is scope to come up with better results.

- There is high concentration of Korean and Japanese food in Cluster 2 which is indicating that the place is possibly well known for both kinds of foods, therefore it might be risky to be opening Indonesian restaurant there
- Cluster 1 and 3 might be better choice for opening the restaurant, therefore further analysis in those areas might be required

# Conclusion

- Classified areas to avoid and areas that can be further explore for opening Indonesian restaurant.
- The accuracy of the analysis might be improved with more data provided or different methods are used.
- Risk of opening Indonesian restaurant in New York is still unknown as there might be other unknown variable taking place such as general population food preference or population of residence living in chosen place.