

# Analysis of the Neighborhoods in Manhattan

Ting Li

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# Introduction

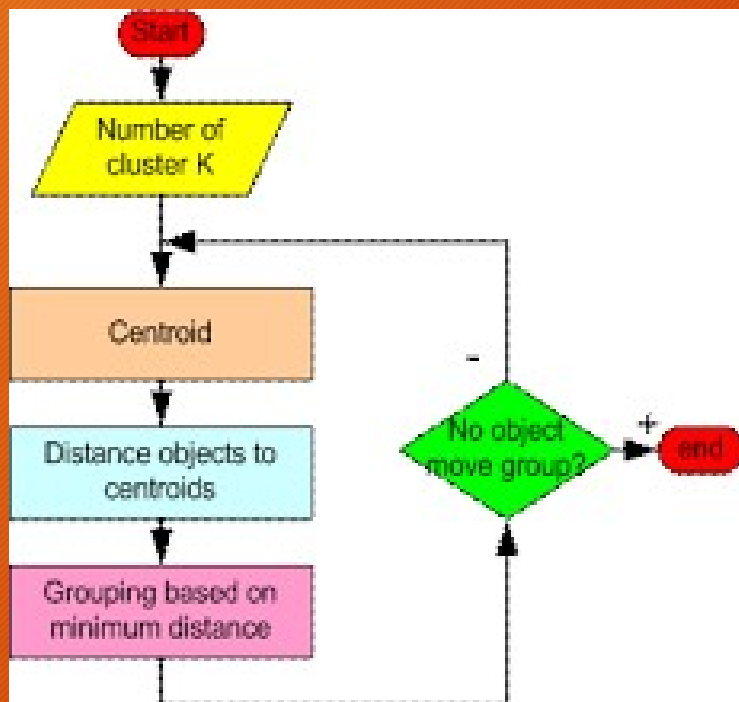
- 1. Manhattan neighborhoods
- 2. Client requirements
  - Restaurants
  - Hotels
  - Neighborhoods



# Data

- 1. Manhattan Neighborhood data
  - [https://geo.nyu.edu/catalog/nyu\\_2451\\_34572](https://geo.nyu.edu/catalog/nyu_2451_34572))
- 2. Foursquare API
  - Venues
  - Ratings

# K means clustering



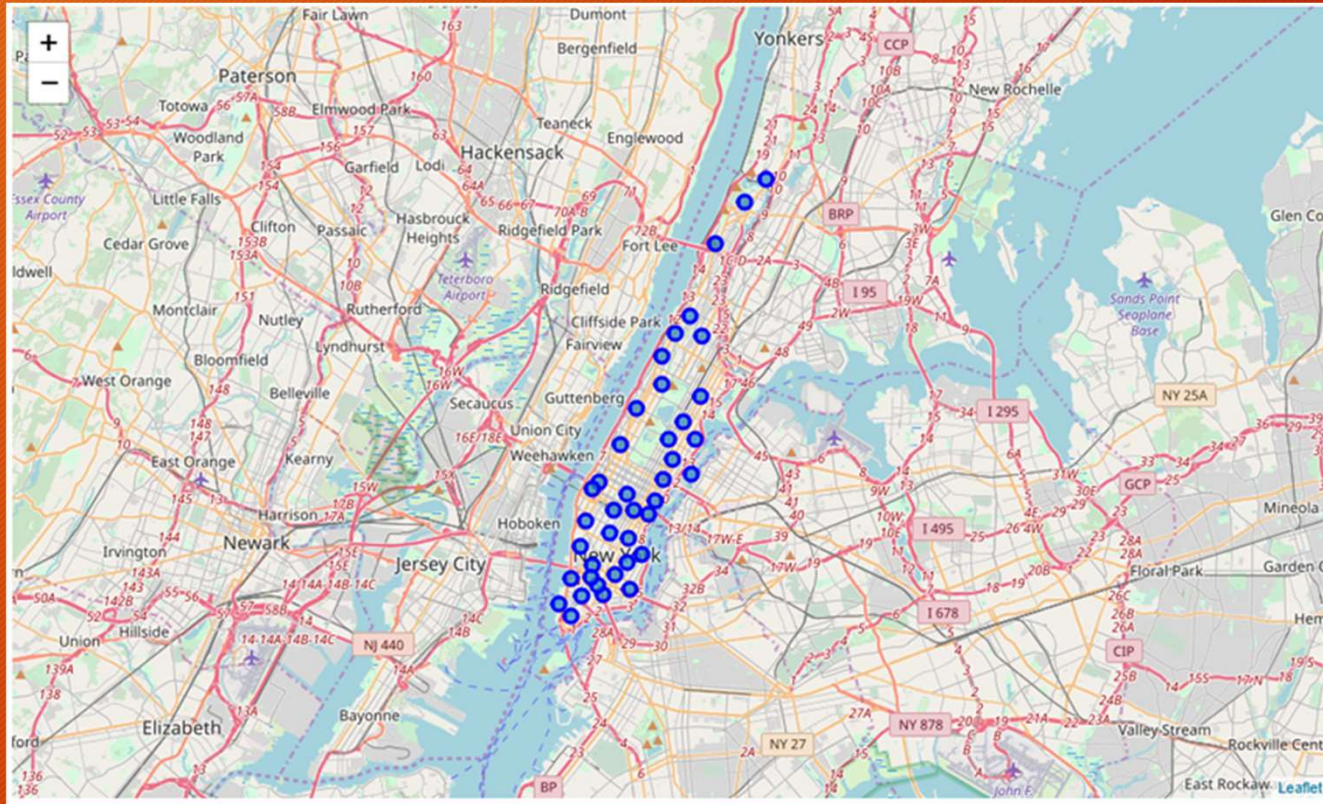
\* people.revoledu.com

- Minimize the intra-cluster distances and maximize the inter-cluster distances
- The items within the cluster is very similar to each other and the items from different clusters will be very different



# Neighborhood analysis

There are 40 neighborhoods in Manhattan in total





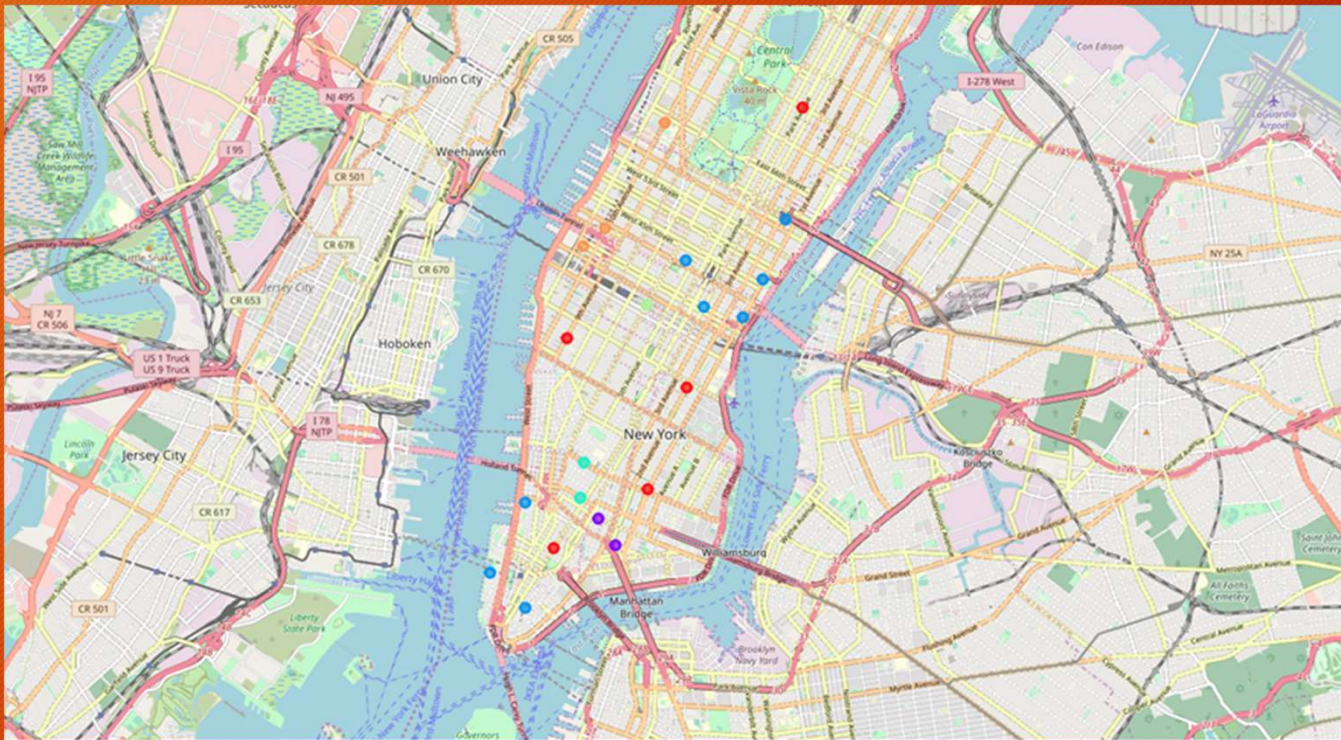
# Data process

- Find the surrounding venue information (500 radius, limit 100) for each neighborhood
- Filter on neighborhoods that has at least one hotel  
-- 20 neighborhoods for further analysis
- Recognize the top 10 venue category in each Neighborhood
- K-means clustering with 6 clusters



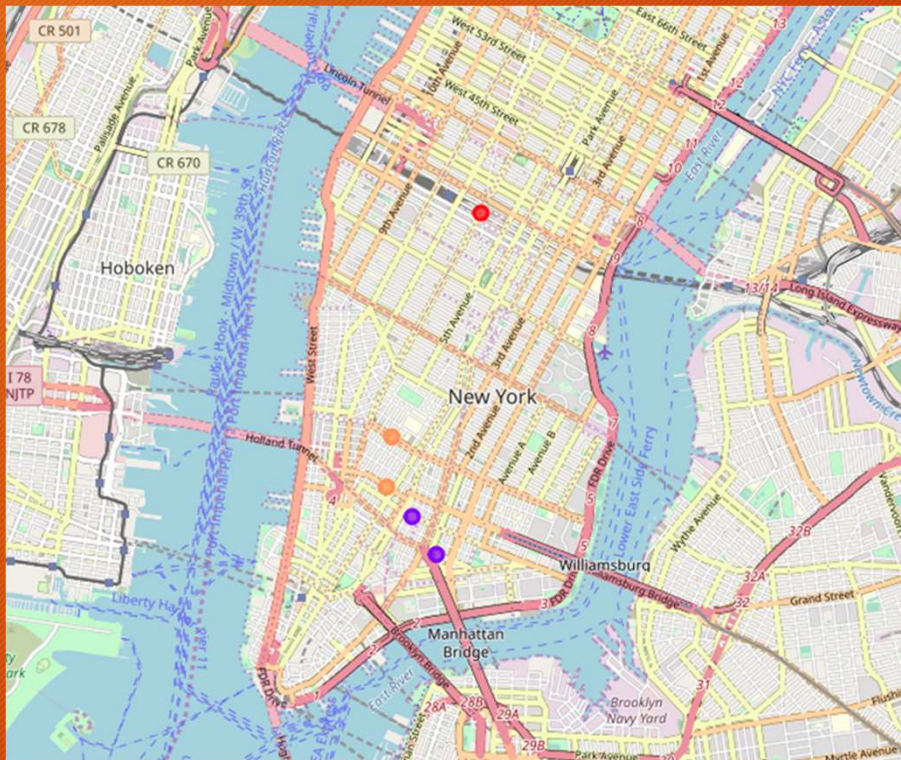
# Neighborhood analysis

Group the neighborhoods into 6 clusters





# Neighborhood analysis



3 Clusters with the most average number of restaurants are chosen for further investigation



# Results

we will choose the neighborhood 'Midtown South' with hotel 'The NoMad Hotel' and neighborhood 'Chinatown' with hotel 'Hotel 50 Bowery NYC' to recommend to our client for the trip

Neighborhood	Borough	Cluster Labels	restaurant_count	Hotel	Hotel rating
Midtown South	Manhattan	4	31	The NoMad Hotel	9.5
Midtown South	Manhattan	4	31	Kimpton Hotel Eventi	9.1
Midtown South	Manhattan	4	31	Ace Hotel New York	9.0
Chinatown	Manhattan	3	43	Hotel 50 Bowery NYC	8.9
Battery Park City	Manhattan	1	9	Conrad New York	8.7
Midtown South	Manhattan	4	31	MADE Hotel	8.5
Financial District	Manhattan	1	22	AKA Wall Street	8.3
Financial District	Manhattan	1	22	Andaz Wall Street	8.3
Financial District	Manhattan	1	22	W New York - Downtown	8.3
Battery Park City	Manhattan	1	9	W New York - Downtown	8.3
Midtown South	Manhattan	4	31	Courtyard by Marriott New York Manhattan/Heral...	8.3
Midtown South	Manhattan	4	31	Hyatt House New York/Chelsea	8.2
Financial District	Manhattan	1	22	Q&A Residential Hotel	8.1
Financial District	Manhattan	1	22	Residence Inn by Marriott New York Downtown Ma...	8.1
Battery Park City	Manhattan	1	9	Holiday Inn Manhattan-Financial District	7.8
Battery Park City	Manhattan	1	9	New York Marriott Downtown	7.8
Battery Park City	Manhattan	1	9	Courtyard by Marriott New York Downtown Manhat...	7.6



# Discussion

- Take into consideration of the quality/rating of each restaurant.
- Considering other perspectives in these neighborhoods (such as demographic data of the people living in the neighborhood) when we do the clustering analysis will provide more insights on the lifestyle of different neighborhoods



# Conclusion

- In this project, we analyzed the neighborhood information using the Manhattan neighborhood data and the Foursquare API location data and try to recommend two neighborhoods with two hotels for our client Lily to stay for her trip to Manhattan next month.
- As the results, 'NoMad Hotel' with a rating of 9.5 in neighborhood 'Midtown South' and 'Hotel 50 Bowery NYC' with a rating of 8.9 in the neighborhood 'Chinatown' will be our recommendation to the client



Q & A

Thank you!~