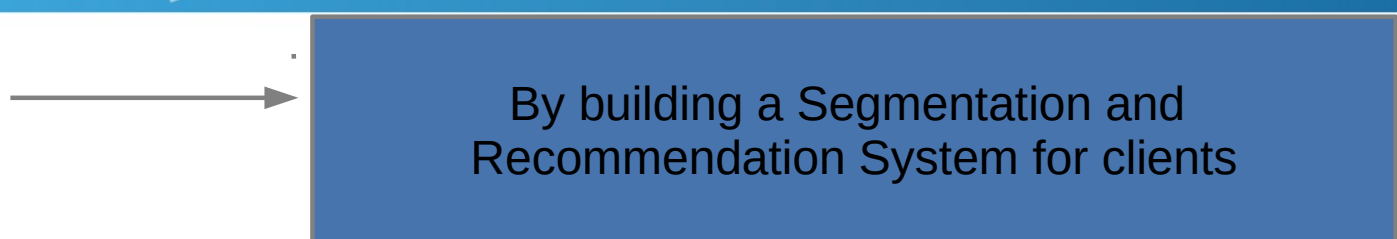# Segmentation and Recommendation of the Manhattan Borough
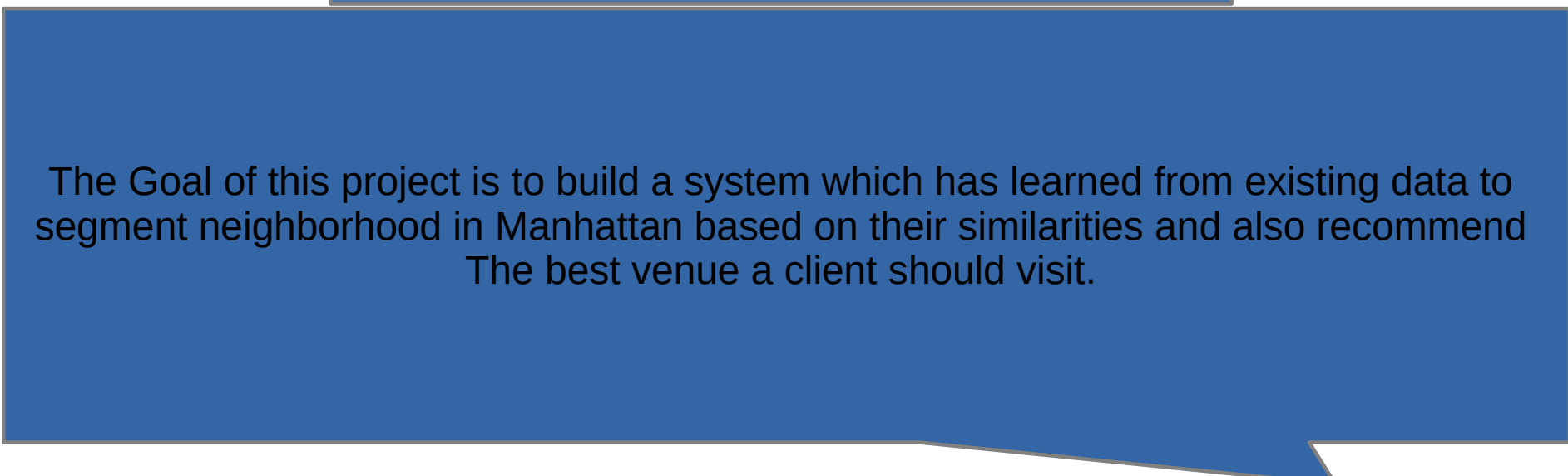
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INTRODUCTION/ BUSINESS PROBLEM

How can we improve the experience of our clients(tourists) during their stay in Manhattan, New York city?

By building a Segmentation and Recommendation System for clients

The Goal of this project is to build a system which has learned from existing data to segment neighborhood in Manhattan based on their similarities and also recommend The best venue a client should visit.

Project Goal

- Segmentation system segments neighborhood based on venues with similar properties

- Recommendation system recommends best venues to visit within several neighborhood based on ratings

DATA ACQUISITION

The New York data was used during this project. The Data was extracted as a json file format from the New York dataset on ibm cloud. The link to the dataset Is available in the report.

METHODOLOGY

- Data was extracted, cleaned ,preprocessed and important features were selected for each task

- Used Foursquare API in extracting Venues in Manhattan and their necessary data

- Plotted Maps of all neighborhood in Manhattan and their respective venues

- Clustered Venues using Kmeans and also used the elbow in finding the optimal K

- Clustered Venues were ploted on a map

- Content based filtering was the recommendation technique for building the recommendation system

- Top recommended Neighborhood and Venue were determined

Clusters on map

CLUSTER DESCRIPTION

Cluster	Description
0	Lively areas (Restaurants, theaters, gym, cafe, store)
1	Consist of Mostly restaurants and also other lively venues
2	Recreational and Relaxation venues
3	Traveler Area (Relaxation and Restaurants)
4	Areas with ranging varieties

Recommendation

- Top recommended Venues

Coffee Shop	121.041107
Chinese Restaurant	104.823430
Cocktail Bar	100.250118
Bakery	94.665548
American Restaurant	89.220361
Café	83.878204
Sandwich Place	78.747735
Mexican Restaurant	78.182389
Yoga Studio	65.367705
Spa	59.588000
Park	55.051312
Pizza Place	53.956900
Hotel	51.066000
Gym / Fitness Center	49.724118
Bar	48.530656
Gym	45.926569
Italian Restaurant	40.938118
Wine Bar	39.085195
Ice Cream Shop	39.071823
Diner	39.065823
Wine Shop	38.954774
Lounge	38.443733
French Restaurant	34.040000
New American Restaurant	31.374235
Caribbean Restaurant	31.216656

- Top recommended neighborhood

	Neighbourhood	recommendation
0	Civic Center	1.377412
1	Chinatown	1.357580
2	Washington Heights	1.127192
3	Inwood	0.780856

Conclusion

- The top 2 neighborhood to visit in Manhattan are Civic Center and Chinatown

- Majority of venue category in Manhattan are restaurants

- The Coffee shop and Chinese Restaurants are the most recommended venue category to visit

- China town was highly influential in the overall rating of Chinese restaurant

- The civic center was also highly influential in the overall rating of coffee shop

- Stuyvesant Town is the best neighborhood for relaxation and recreation