FINDING THE BEST SPOT TO START A RESTAURANT IN NYC

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INTRODUCTION

- NEW YORK is a big city visited by many every year presenting a great opportunity for investors.
- If a restaurant is to be opened in the city , where would be the best spot to target tourists?
- What is the trending food type the proposed restaurant can provide?

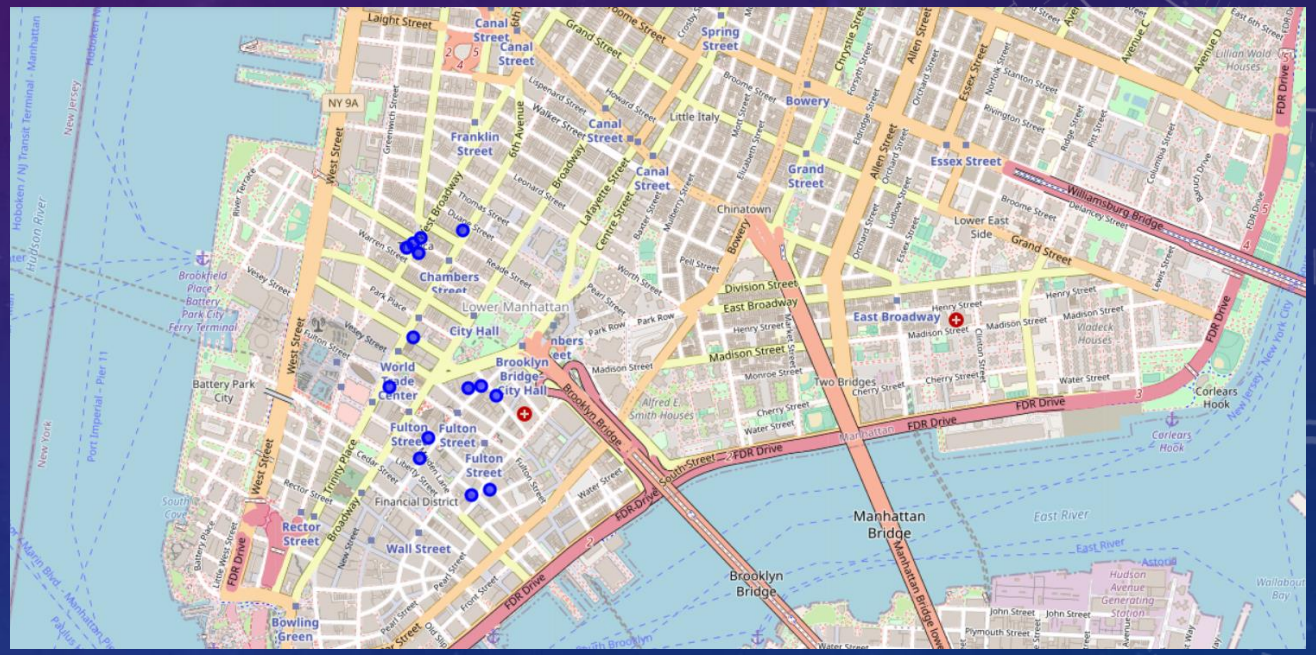
DATA

- Geocoder package for latitude and longitude coordinates.
- Foursquare API is the main source of data in our problem.
- Two datasets were retrieved, cleaned, and prepared for analysis
- Hotels dataset with locations
- Trending restaurants dataset with categories and location

ANALYSIS AND RESULTS

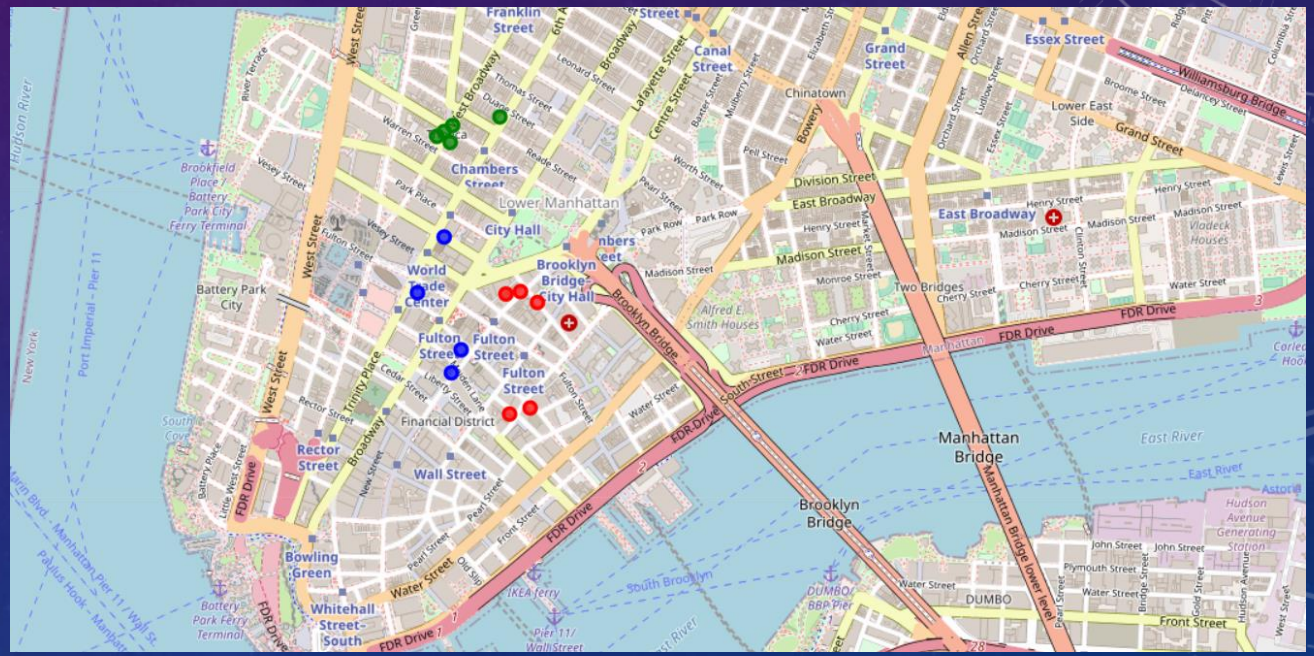
HOTEL LOCATIONS IN NYC

- The hotels data was visualized on a map with folium to see where they are located.
- To find the touristic areas (where there are hotels in high densities), we need to group the hotels in clusters.
- By visual inspection, we can see that they can be clustered into 3 groups.



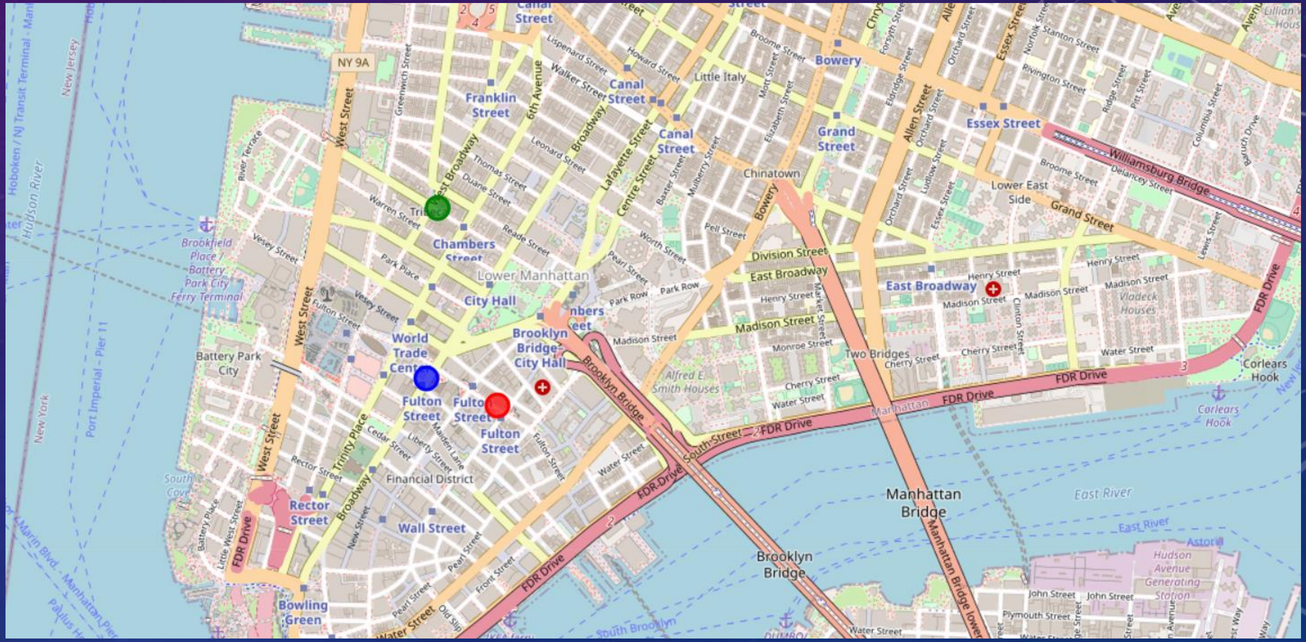
CLUSTERING HOTELS WITH K-MEANS

- K-Means Clustering algorithm was used to group the hotels in three clusters.
- Red-green-blue coloring scheme was used to differentiate hotels of different clusters.



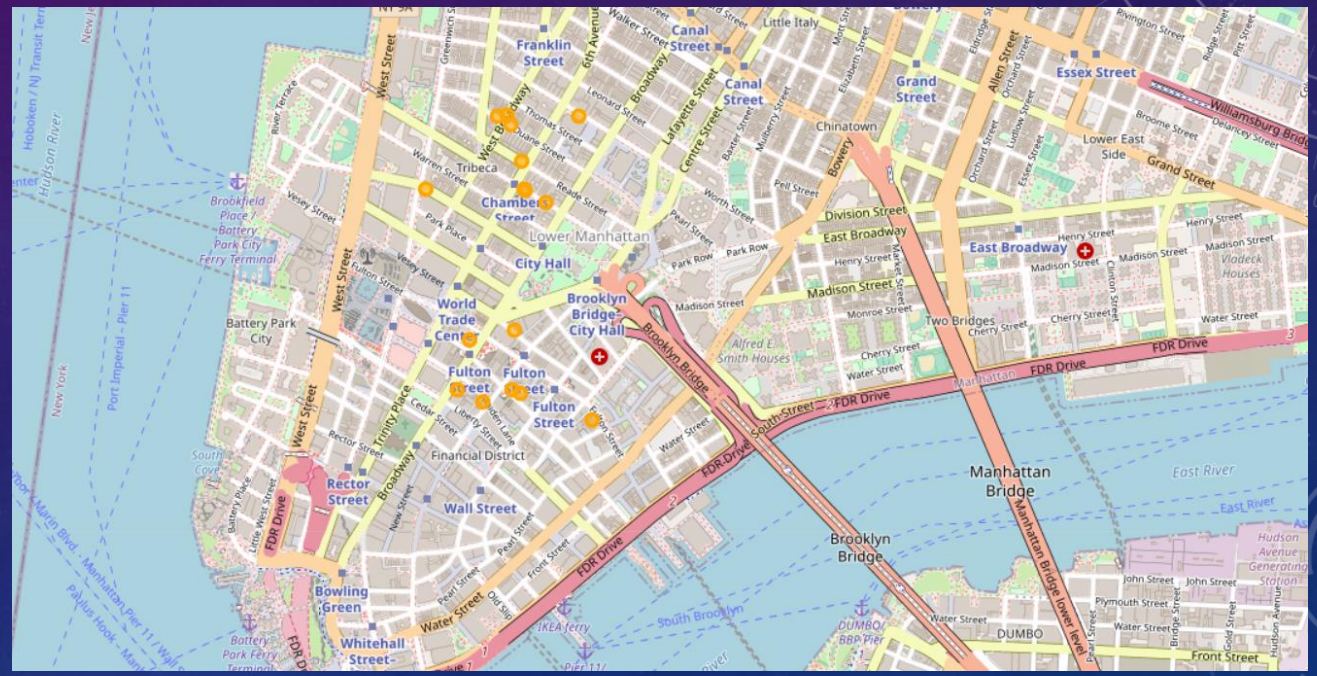
CLUSTERS CENTERS

- Each cluster generated by K-Means had hotels centered around a single point, these points location coordinates were retrieved and visualized.



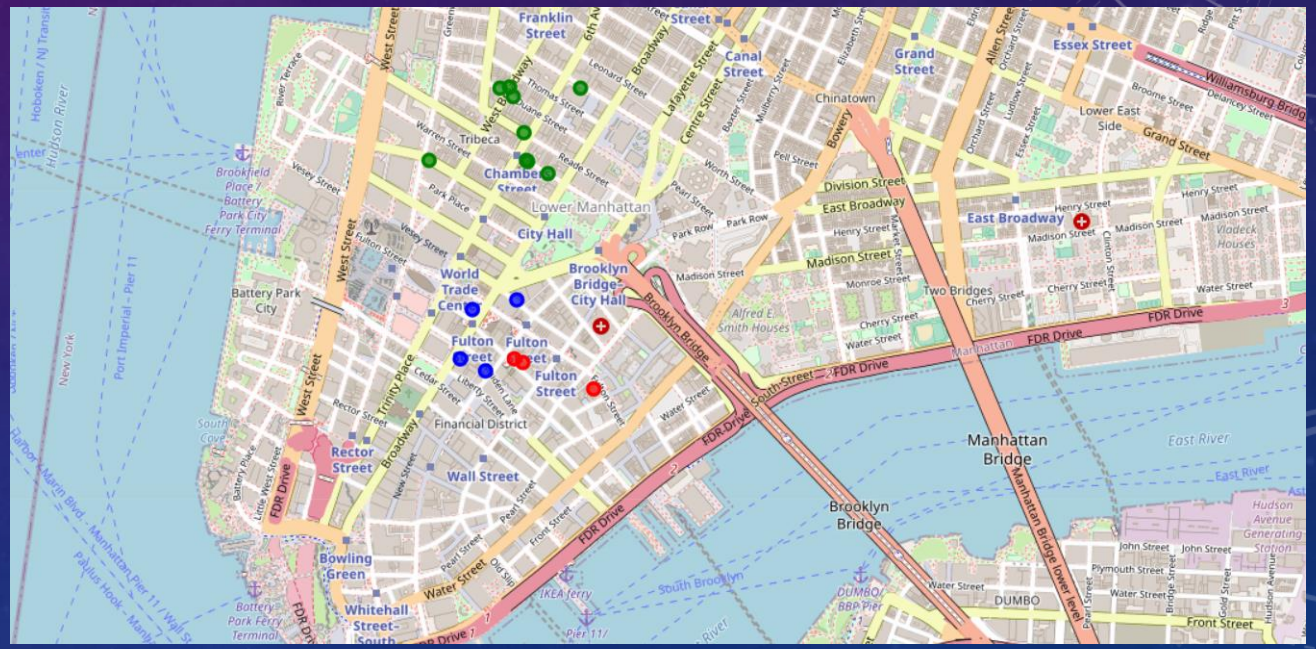
RESTAURANTS LOCATION IN NYC

- Restaurants locations were retrieved from Foursquare API and visualized on the map.
- To know which hotel cluster had the lowest competition in restaurants we need to classify the restaurants in these clusters and count them.



CLASSIFYING RESTAURANTS USING KNN

- KNN Classification algorithm was used to assign a class label to each restaurant in our dataset.
- The KNN model was trained on the centers' locations dataset.
- Each restaurant was assigned the value of the closest single center.



LOWEST COMPETITION

- To find the lowest level of competition we look for the area of the minimum number of restaurants.
- It was found that the red region have minimum number of restaurants.

Class Labels	Number Of Restaurants
0(Red)	3
1(Green)	9
2(Blue)	4

OPPORTUNITY EVALUATION

- To accurately evaluate the opportunity in the red region, we calculated the ratio of number of restaurants to the number of hotels.
- It was found that the red region had only 3 restaurants for 5 hotels , making it as the lowest ratio for number of restaurants to number of hotels.
- With minimum competition and attractive opportunity, the red region is the suitable spot for starting a new restaurant.

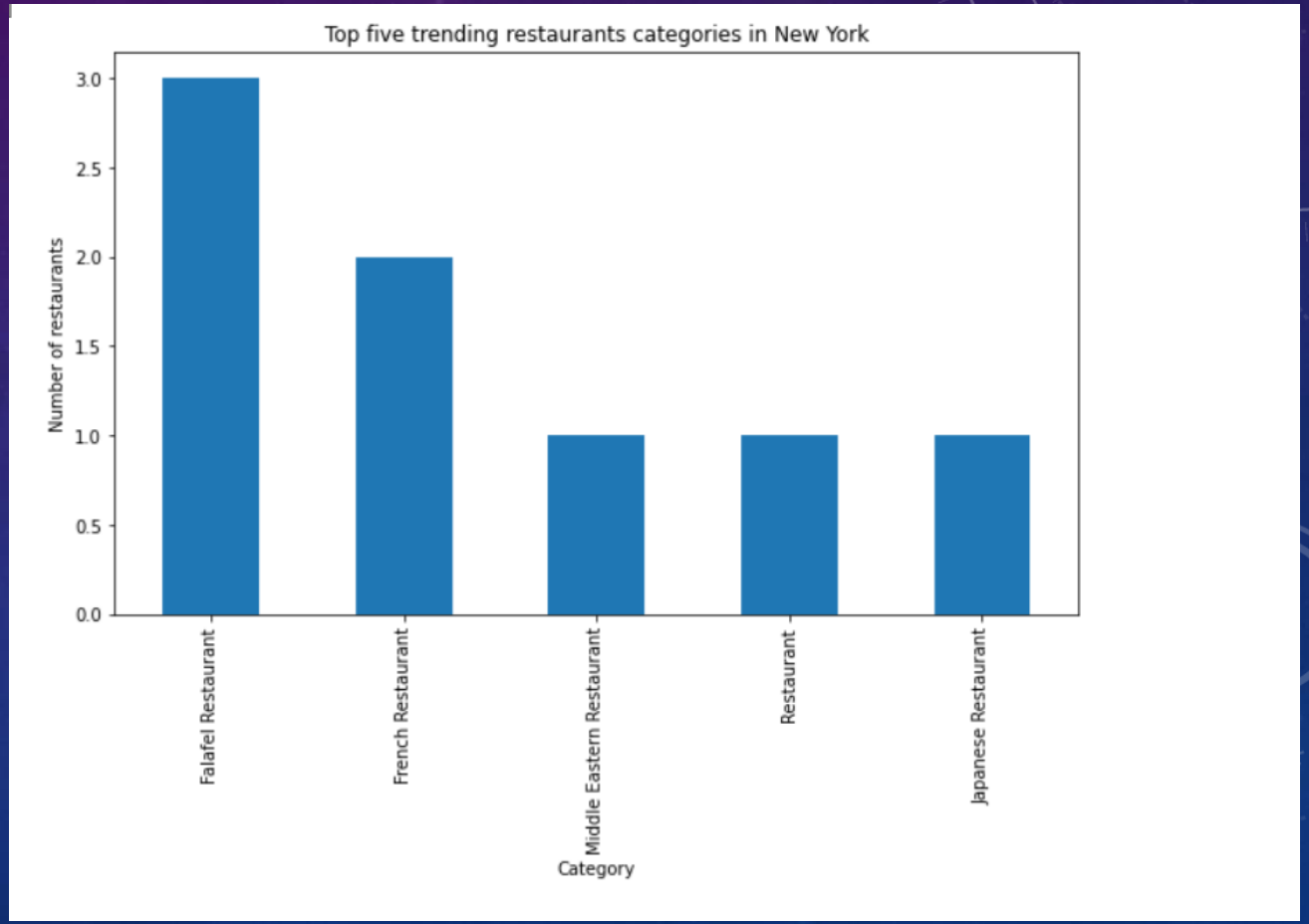
Cluster Label	Number Of Hotels
0(Red)	5
1(Green)	5
2(Blue)	4

RATIO OF RESTAURANTS TO HOTELS IN A REGION

Region	Number of Restaurant	Number of Hotel	Ratio
0(Red)	3	5	0.6
1(Green)	9	5	1.8
2(Blue)	4	4	1.0

TRENDING FOOD CATEGORY

- To find the food category in demand we analyzed the category of each restaurant in the dataset and counted the frequency of each category.
- As the dataset represent restaurants with the highest foot-traffic levels, they were considered trending venues.
- It is found that falafel is the trending food type.



CONCLUSION

- Answer to the business question: Where in New York should investors open a restaurant, targeting tourists and what food type should they serve?
- RED region (cluster 0) was found to be the best region to open a new restaurant as it was having the lowest ratio for the number of restaurants to the number of hotels.
- Falafel was found to be the trending food type , Hence the best choice for the restaurant.

THE END