

CAPSTONE PROJECT

IBM DATA SCIENCE

BY

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Business Problem

- Location of the shopping mall is one of the most important decisions that will determine whether the mall will be a success or a failure
- Objective: To analyze and select the best locations in the city of Mumbai to open a new shopping mall and to see whether starting any other business would be more beneficial than shopping mall.
- Business question ➤ In the city of Mumbai, if a property developer is looking to open a new shopping mall, where would you recommend that they open it? Is any other business would be better than shopping mall in Mumbai?

Data

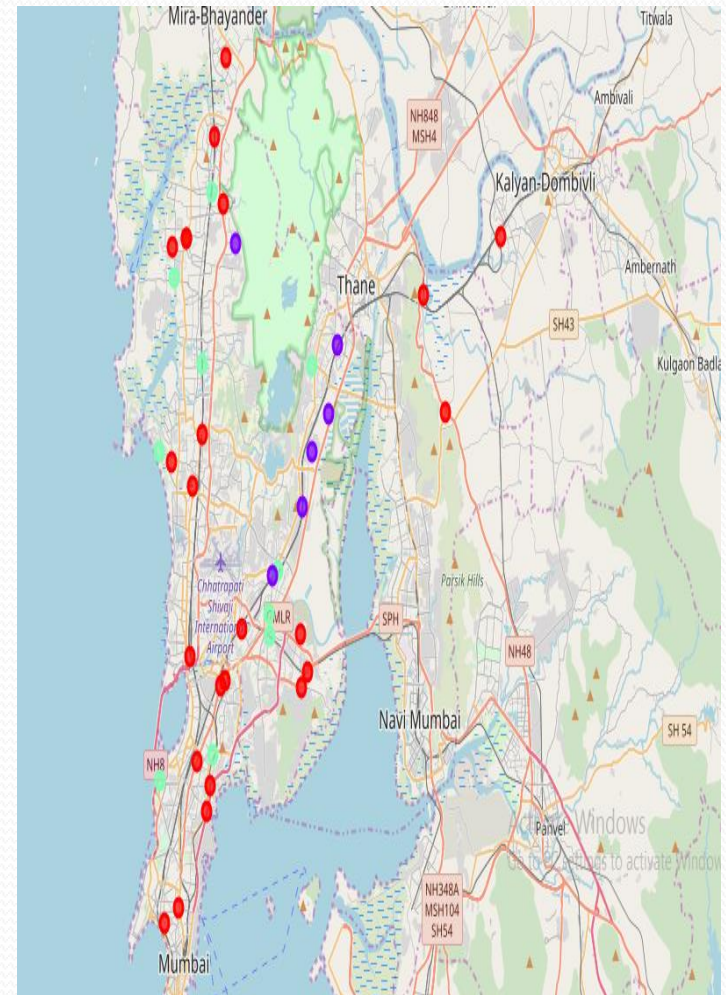
- Data required
 - List of neighborhoods in Mumbai
 - Latitude and longitude coordinates of the neighborhoods
 - Venue data, particularly data related to shopping mall.
- Sources of data
 - Wikipedia page for neighborhoods
(https://en.wikipedia.org/wiki/Category:Suburbs_of_Mumbai)
 - Geocoder package for latitude and longitude coordinates
 - Foursquare API for venue data

Methodology

- Web scraping Wikipedia page for neighborhoods list
- Get latitude and longitude coordinates using Geocoder
- Use Foursquare API to get venue data
- Group data by neighborhood and taking the mean of the frequency of occurrence of each venue category
- Filter venue category by Shopping Mall
- Perform clustering on the data by using k-means clustering
- Visualize the clusters in a map using Folium
- Doing analysis for getting another best venue and applying clustering on it.

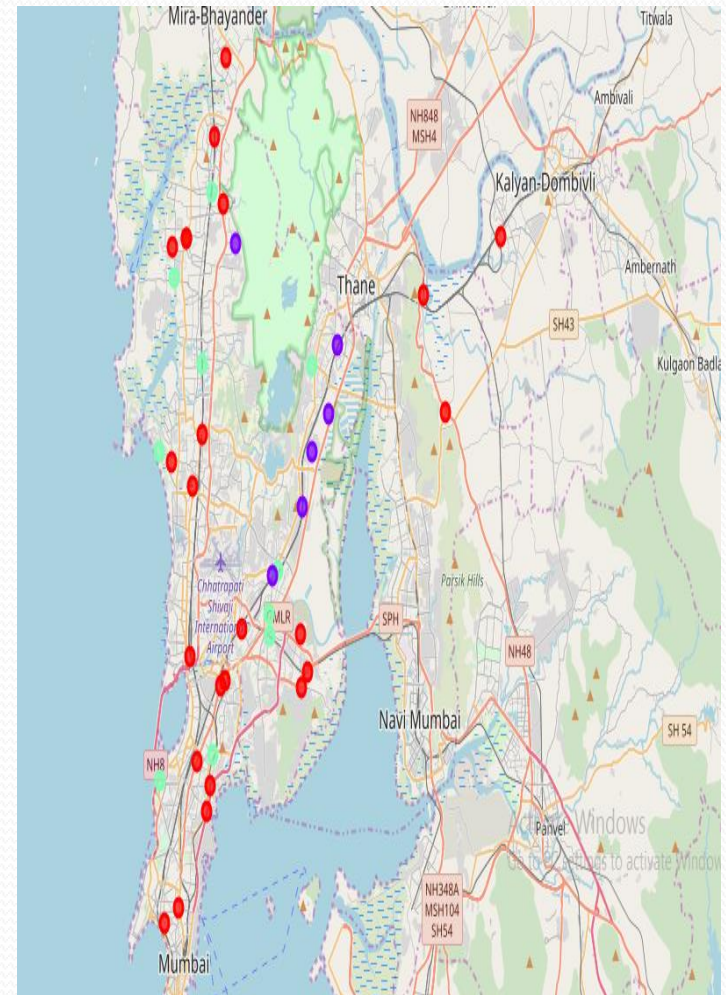
Results

- Categorized the neighborhoods into 3 clusters :
 - Cluster 0: Neighborhoods with low number to no existence of shopping malls
 - Cluster 1: Neighborhoods with more number of shopping malls.
 - Cluster 2: Neighborhoods with moderate concentration of shopping malls



Results of Ice Cream Shop

- Categorized the neighborhoods into 3 clusters :
 - Cluster 0: Neighborhoods with moderate number of Ice Cream Shops.
 - Cluster 1: Neighborhoods with low number to no existence of Ice Cream Shops
 - Cluster 2: Neighborhoods with high number of Ice Cream Shops.



Discussion

- There are very less Shopping Malls in Mumbai.
- Shopping malls are not most common visiting place in Mumbai.
- Cluster 0 has no shopping malls.
- Ice Cream Shop is one of the common visiting places in Mumbai.
- Cluster 1 has no Ice Cream Shops.

Recommendations

- Cluster 0 has no shopping malls, so it would be nice to start shopping mall in these areas.
- Ice Cream Shop would be better business than shopping mall.
- Ice Cream Shop is one of the common visiting places in Mumbai.
- It is better to start Ice Cream Shops in cluster 1 areas.

Conclusion

- Answer to business question: The neighborhoods in cluster 0 are the most preferred locations to open a new shopping mall and neighborhoods in cluster 1 are the most preferred locations to open a Ice Cream Shop.
- Findings of this project will help the relevant stakeholders to capitalize on the opportunities on high potential locations while avoiding overcrowded areas in their decisions to open a new shopping mall and to find best business to invest their money.