# Coursera Capstone

## IBM Applied Data Science Capstone

## Finding a potential venue for opening new Hotel in Mumbai, India

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# Introduction/Business Problem

- In a metro city like Mumbai, the business tourism has been developing quite rapidly.
- The main motivation of doing this capstone project is to develop a plan to find best suitable venue or location for opening new hotels in Mumbai, India.
- The business problem can be defined as “If we have data of neighborhoods and venue details, can we suggest a potential venue or area for starting new hotel project?”
- The target audience for this project is property developers and hotel business professional builders who are looking to invest or venture by opening new hotel

# Data Description

- Following data are required for developing this project :
- List of suburbs in Mumbai, India
- Coordinates for each suburb (Neighborhood) in terms of Longitude and Latitude
- The data related to Hotels (Venue Data)
- The suburbs data can be retrieved from https://en.wikipedia.org/wiki/Category:Suburbs_of_Mumbai
- We can get coordinates in terms of Longitude and Latitude from Geocoder package of python for each suburbs of Mumbai.
- Foursquare API can be used for collecting venue data for the neighborhoods.

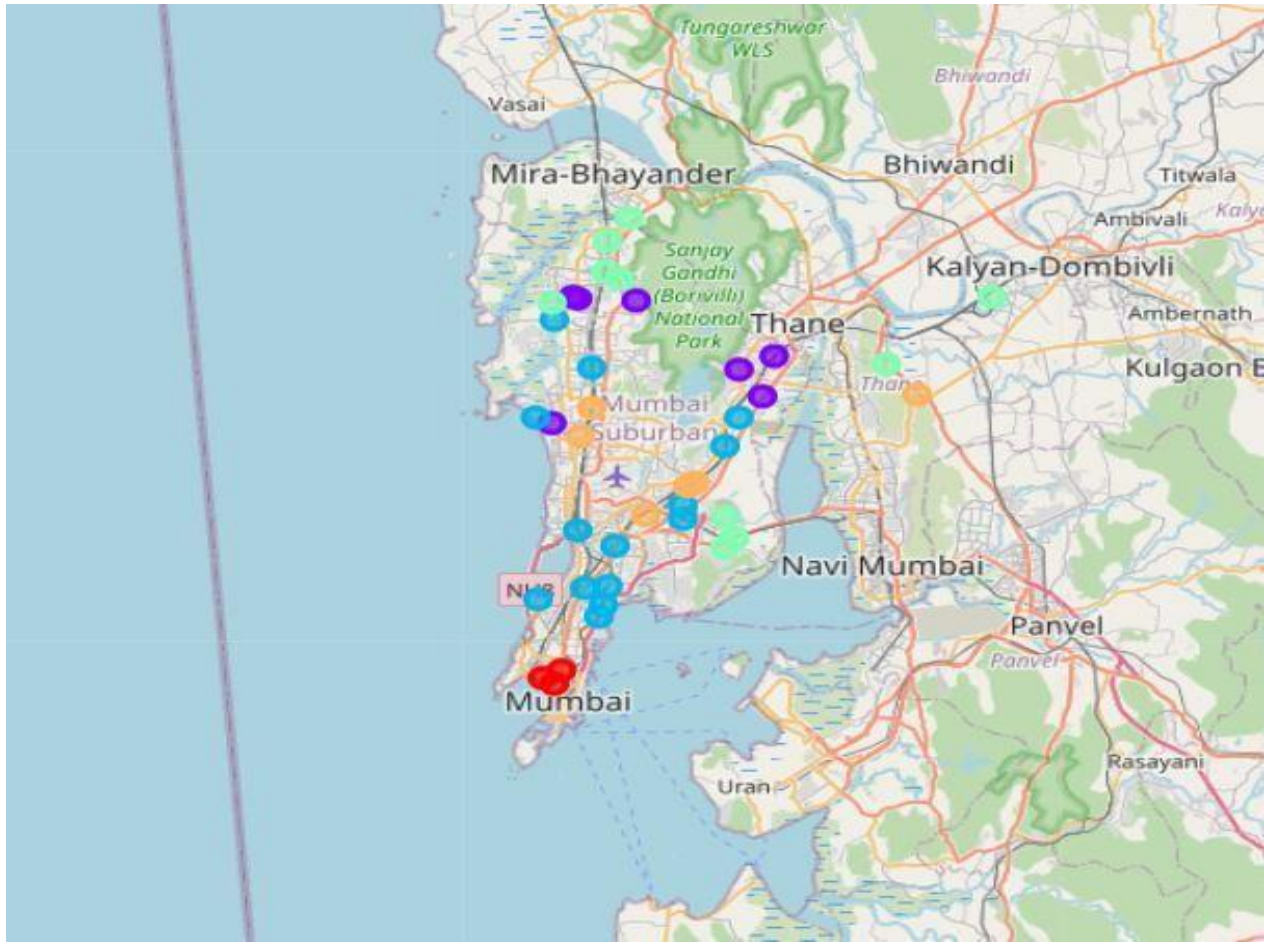
# Methodology

- We can gather suburbs data from https://en.wikipedia.org/wiki/Category:Suburbs_of_Mumbai
- We can use Web Scrapping to collect this data which can be further used for getting coordinates (Longitude and Latitude) of each suburb.
- Foursquare API can be used to collect information of surrounding and other information by querying with coordinates.
- We can pass this information to Foursquare API calls to get venue data in JSON format.
- For this project we have used top 100 venues within the radius of 5000 meters. From the collected data, we extract venue name, category, longitude value and latitude value

# Methodology (Cont.)

- We get 3805 values for different venues associated with different suburbs. There are 159 unique categories found for venues.
- Then we extract information which contains “Hotel” as venue category. So we can have new dataframe consisting only nighborhood and hotel information.
- We can now use clustering algorithm K-Means Clustering to cluster these information in 5 different clusters.
- After clustering we can visualize the results. Also we can view details of suburbs falling in each cluster individually to get an idea of hotel density among these suburbs.

# Results


Tungareshwar WLS
Bhiwandi
Vasai
Mira-Bhayander
Bhiwandi
Titwala
Ambivali
Sanjay Gandhi (Borivili) National Park
Kalyan-Dombivli
Ambernath
Thane
Kulgaon
Mumbai Suburban
Navi Mumbai
Panvel
Mumbai
Rasayani
Uran

# Results (Cont.)

- The map indicates that there are different density of hotels in different areas. So that we can visualize this in a way to determine potential areas for developing new hotel project.
- By results of clustering and seeing the suburbs and their respective hotel venue data, we can draw an important insight as follows: Mostly the hotels are scattered in cluster 3 and 5.
- Because these areas have higher financial capabilities and nearer to Railway Stations and Airport. We can see that cluster 2 and 4 have almost no hotels in the neighborhood.
- So that we can see these areas as potential areas for opening new hotels.

# Discussion

- From the results and observations, we can say that Cluster-2 and Cluster-4 are most suitable for development of new hotel project.
- The suburbs in the areas falling under Cluster-2 and Cluster-4 are can be thoughtful suggestions locations for building new hotel.
- In contrast, the Cluster-1 and Cluster-5 has excessive amount of hotels as compared to other areas.
- So we can say that in the areas falling under the Cluster-2 and Cluster-4 has great potential and provide great opportunity for building a new hotel project

# Conclusion

- From this project, we can conclude that we can find potential areas or locations which can be beneficial for developing and starting new hotel business.
- We can use data science concepts along with the appropriate data and usage of data to make suggestions which can not be given without looking at and understanding data.
- We have used Wikipedia data for collecting suburbs information of Mumbai, India which is fed to Geocoder package for obtaining coordinates.
- Then we have employed Foursquare API for extracting the venues information based on the longitude and latitude information of each suburb.
- Then the clusters are created based on the data using K-Means clustering algorithm and from the results we can suggest or recommend potential and beneficial areas for developing new hotel project.

# References


- Suburbs in Mumbai, India. Source : https://en.wikipedia.org/wiki/Category:Suburbs_of_Mumbai
- Foursquare API Documentation. Source : https://developer.foursquare.com/docs/places-api/

# Thank you…