

Generating Area-based recommendations regarding the category of Restaurants to open in Mumbai

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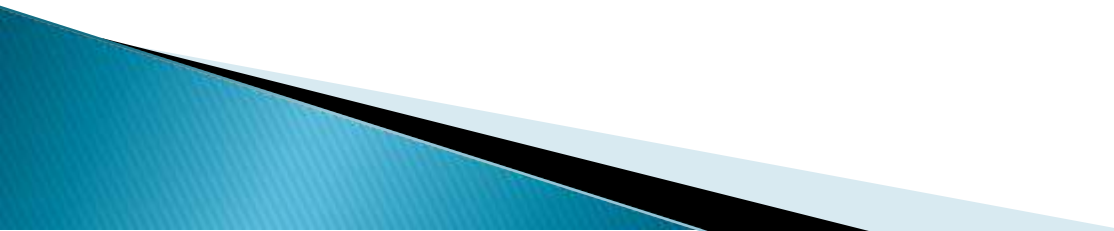
Business Problem and Target Audience

- ▶ Opening the right-type of restaurant serving the particular category of cuisine is very important for anyone who wants to start a new business venture in terms of restaurants.
- ▶ The target audience for this project includes any **new food chain** who is interested in starting a **new business venture** in the **city of Mumbai** and wishes to have recommendations regarding **which particular cuisine or which particular food item** they should serve in **their outlets** based on the **particular Area in Mumbai** where they are planning **to set up their new outlets**.

Data Acquisition and Cleaning

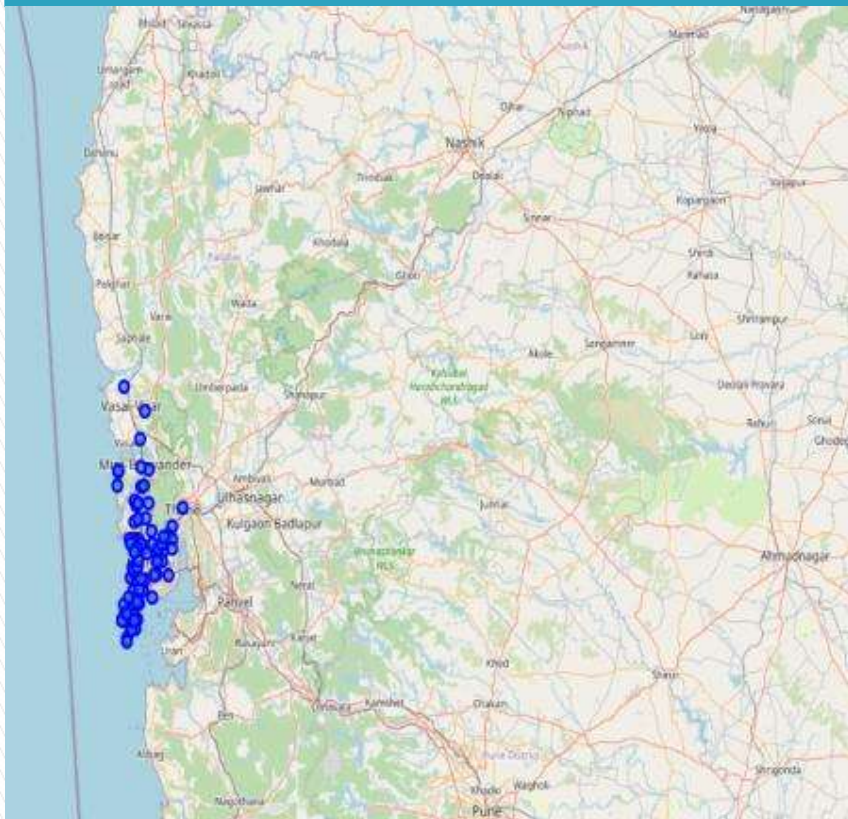
- ▶ Area , Location and Co-Ordinates of Mumbai are obtained from web-scraping the below url:-

https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Mumbai

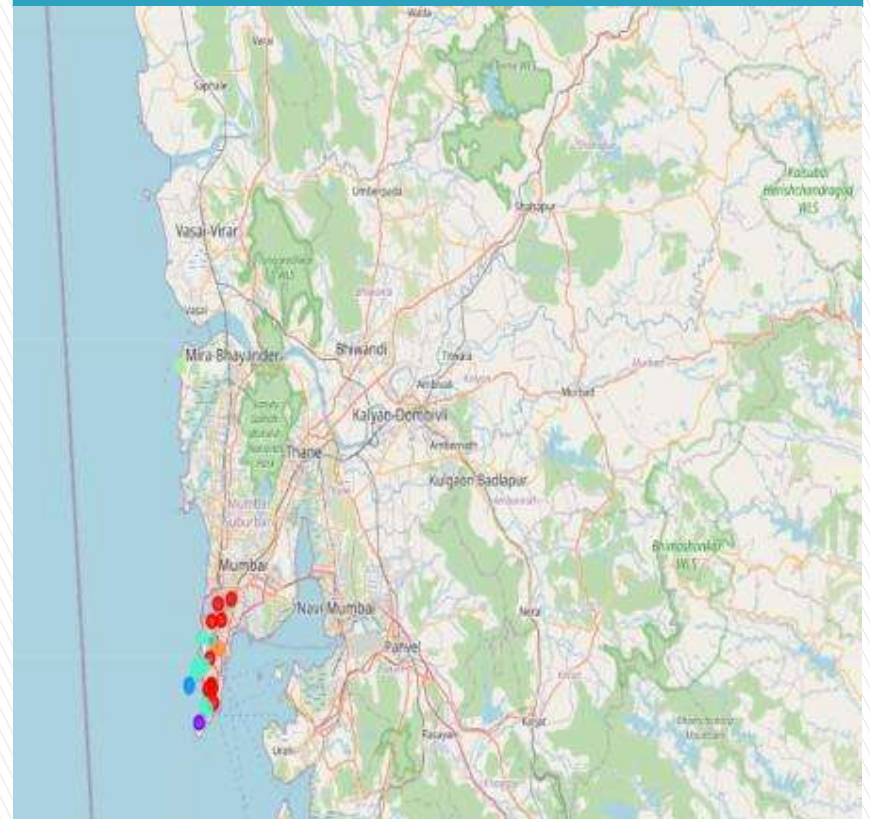
- ▶ We have also used **Python's geopy package** to obtain the latitude and longitude of all the Areas of Mumbai and generated the map of Mumbai with locations superimposed on them using **folium**.
 - ▶ Finally we use **Four Square API** to generate **nearby venues and their categories** for a particular Area of Mumbai.
 - ▶ This data is cleansed pre-processed and conditioned into a data frame to obtain the **10 most popular venues** for each Area which is then used for **clustering the Areas** based on the popularity of venues.
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Generating the maps of Mumbai using Folium and Geopy package of python.

Using the folium and Geopy we plot the map of Mumbai with locations superimposed on top.



After clustering of the Areas in South Mumbai with respect to the most popular venues.



Final cleaned and pre-processed dataset used for Clustering

	Area	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Agripada	Bakery	Indian Restaurant	Coffee Shop	Gym	Restaurant	Food Court	Diner	Donut Shop	Dumpling Restaurant	Electronics Store
1	Altamount Road	Café	Indian Restaurant	Coffee Shop	Bakery	Theater	Sandwich Place	Food	Diner	Donut Shop	Dumpling Restaurant
2	Bhuleshwar	Indian Restaurant	Restaurant	Cheese Shop	Fast Food Restaurant	Food	Ice Cream Shop	Market	American Restaurant	Tea Room	Concert Hall
3	Breach Candy	Café	Coffee Shop	Bakery	Sandwich Place	Fast Food Restaurant	Department Store	Dessert Shop	Men's Store	Japanese Restaurant	Italian Restaurant
4	Carmichael Road	Ice Cream Shop	Chinese Restaurant	Fast Food Restaurant	Food Truck	Snack Place	Outlet Mall	Café	Sandwich Place	Shopping Mall	Deli / Bodega

Clustering Results

	Area	Location	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Agripada	South Mumbai	18.977700	72.827300	0.0	Bakery	Indian Restaurant	Coffee Shop	Gym	Restaurant	Food Court	Diner	Donut Shop	Dumpling Restaurant	Electronics Store
1	Altamount Road	South Mumbai	18.968100	72.809500	3.0	Café	Indian Restaurant	Coffee Shop	Bakery	Theater	Sandwich Place	Food	Diner	Donut Shop	Dumpling Restaurant
2	Bhuleshwar	South Mumbai	18.950000	72.830000	0.0	Indian Restaurant	Restaurant	Cheese Shop	Fast Food Restaurant	Food	Ice Cream Shop	Market	American Restaurant	Tea Room	Concert Hall
3	Breach Candy	South Mumbai	18.967000	72.805000	3.0	Café	Coffee Shop	Bakery	Sandwich Place	Fast Food Restaurant	Department Store	Dessert Shop	Men's Store	Japanese Restaurant	Italian Restaurant
4	Carmichael Road	South Mumbai	18.972200	72.811300	3.0	Ice Cream Shop	Chinese Restaurant	Fast Food Restaurant	Food Truck	Snack Place	Outlet Mall	Café	Sandwich Place	Shopping Mall	Deli / Bodega
5	Cavel	South Mumbai	18.947400	72.827200	0.0	Indian Restaurant	Café	Bakery	Cheese Shop	Chinese Restaurant	Coffee Shop	Bar	Train Station	Movie Theater	Multiplex
6	Churchgate	South Mumbai	18.930000	72.820000	3.0	Hotel	Italian Restaurant	Restaurant	Wine Bar	Coffee Shop	Indian Restaurant	Sandwich Place	Diner	Mexican Restaurant	Mediterranean Restaurant
7	Cotton Green	South Mumbai	18.986209	72.844076	5.0	Whisky Bar	Train Station	Plaza	Bakery	Yoga Studio	Food Court	Dessert Shop	Diner	Donut Shop	Dumpling Restaurant
8	Cuffe Parade	South Mumbai	18.910000	72.810000	1.0	Indian Restaurant	Garden	Food Court	Dessert Shop	Diner	Donut Shop	Dumpling Restaurant	Electronics Store	Farmers Market	Fast Food Restaurant
9	Cumbala Hill	South Mumbai	18.965833	72.805833	3.0	Café	Coffee Shop	Fast Food Restaurant	Concert Hall	Men's Store	Japanese Restaurant	Italian Restaurant	French Restaurant	Dessert Shop	Department Store
10	Currey Road	South Mumbai	18.994000	72.833000	0.0	Indian Restaurant	Coffee Shop	Plaza	Maharashtrian Restaurant	Food	Dessert Shop	Diner	Donut Shop	Dumpling Restaurant	Electronics Store

Discussion

- ▶ A very important observation that surfaces from the above analysis is that if we take a closer look at the different clusters we find that in **Cluster 1** the first most common venue is “**Indian Restaurants**” and the second and third most common venues are mainly **Coffee Shops, Bakeries, Café’s, Pizza Corners and other fast food restaurants**. So, it is very clear that people residing in **Cluster 1** areas have a special liking or prefer **Indian cuisine over other cuisines**. But, at the same time since this cluster has a high density of Indian Restaurants as their most popular venue, so keeping in mind **the tough competition from other popular food joints** any new business venture should be a bit cautious in serving Indian cuisine in these areas. **But if they can improvise their menu to serve quality Indian food items or add some newer items and can lower the rates**, then they can attract these customers to dine at their joints.
- ▶ If we examine **Cluster 4**, we find mostly **Cafe’s, Ice Cream Shops, Coffee Shops and Bakery as the most popular venues**. So, it is very clear that people residing in Cluster 4 areas have a special liking or prefer light refreshments over heavy course meals. So, going by the above analysis, it will be quite advantageous for any new food chain to open these kinds of light food joints in the areas that fall within this cluster. **But if they want to avoid competition from other vendors** they can as well open up Indian Restaurants as there are **very few restaurants** serving Indian Cuisine in these areas.

Conclusion and Future Scope

- ▶ All these analyses will be of great help for any new food chain which wants to start operation in Mumbai, they can decide well on their business strategy to maximize their ROI by avoiding stiff competition as well as catering to the preferences of people residing in a particular Area.
 - ▶ This analysis can be further extended to other locations of Mumbai like Andheri, Western Suburbs, Mira-Bhayandar, Western Suburbs, Bandra, Western Suburbs, Kandivali East, Western Suburbs etc.
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