OPENING A BAKERY SHOP IN MUMBAI- INDIA

IBM APPLIED DATA SCIENCE CAPSTONE PROJECT

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INTRODUCTION

- Bakeries are a popular type of foodservice establishment, and they allow us to express our culinary creativity while also serving a unique market.
- The profit potential for a bakery is good, but starting a food business is never easy. Opening a bakery presents many unique challenges that are different from other types of businesses.
- One of the first steps to how to start a bakery business in India is therefore to decide a good location. The location plays a huge role in its success.
- Although a great location may not guarantee success, a bad location will almost always guarantee failure.
  - Look out for the competitors in the area. **Lesser the competition**, easier is the sales.
  - The best location combines visibility, affordability and lease terms you can live with.

BUSINESS PROBLEM

The objective of this Capstone project is to analyze and select the best location to opening a Bakery Business in the India's Financial capital, Mumbai. Using the data Science methodology and machine learning techniques like clustering, the aim is to provide answer to the question:

If a Restaurateur is planning to open a new Bakery business in Mumbai, where would you recommend it?

Success Criteria

The success criteria of this project will be a good recommendation of the neighborhood choice in Mumbai to the Restaurateur based on 2 key factors;

- lack of Bakery Shops available (less competition), and
- higher number of residences presented (higher demand).

DATA

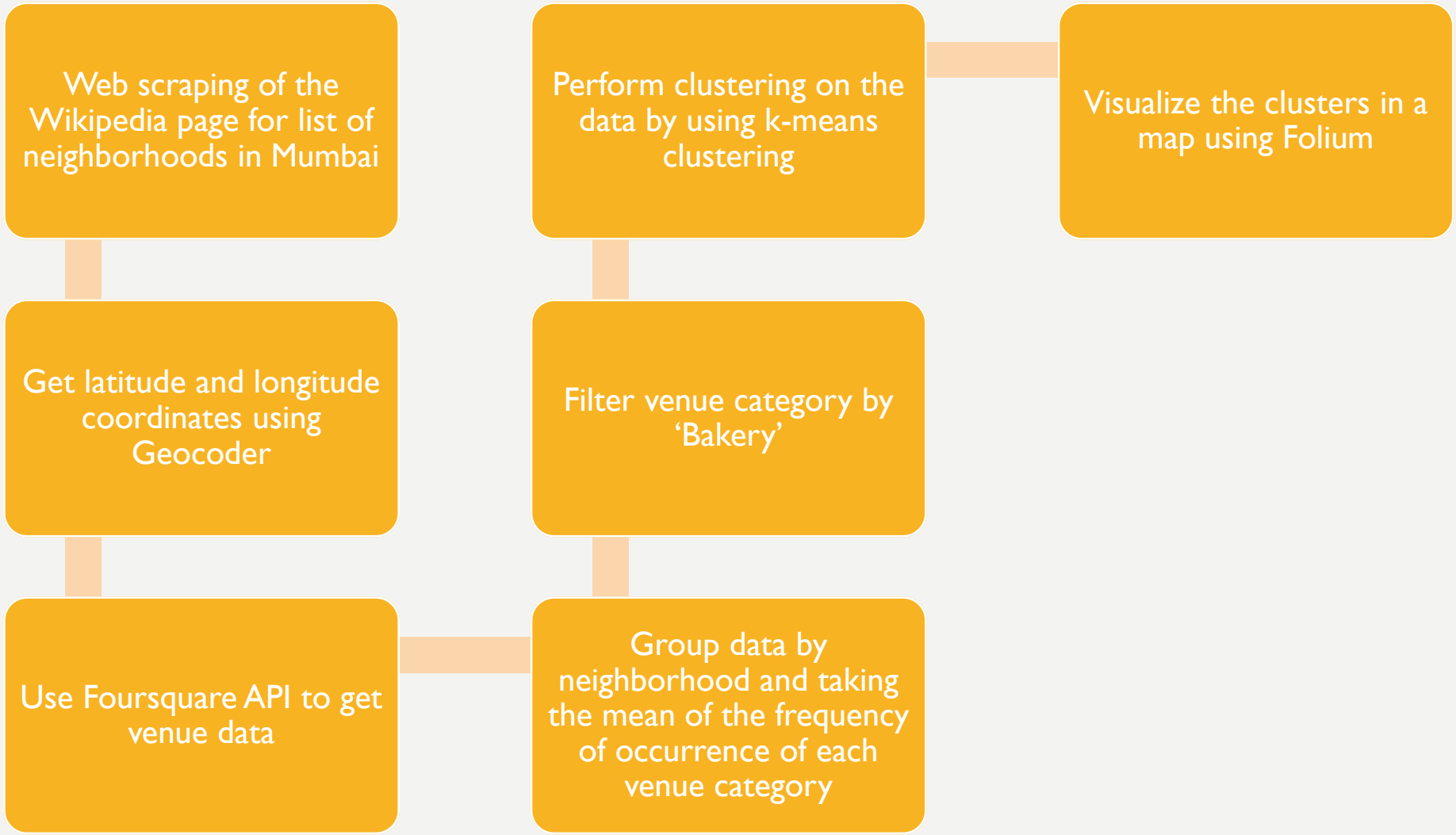
We would need the following data to analyze the opportunity:

- List of neighborhoods in Mumbai, India. This defines the scope of the project which is confined to the city of Mumbai.
- Latitude and Longitude coordinates of those neighborhoods. This will help us to plot the locations on the map and also get the venue data.
- Venue data, particularly Venue equals to Bakery. We will use this data set to perform Clustering.

Sources of data

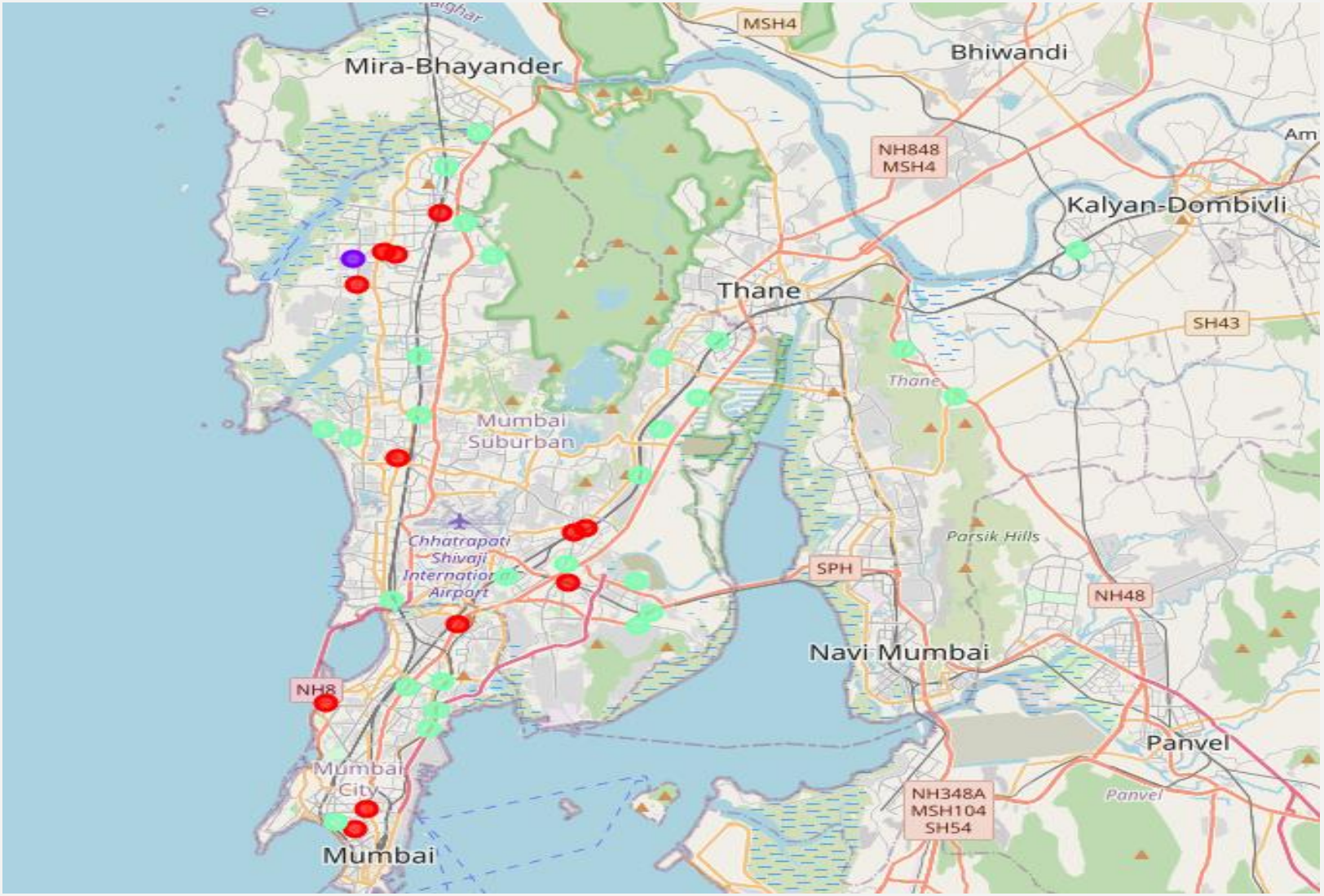
- Wikipedia page for neighbourhoods in Mumbai, India ("https://en.wikipedia.org/wiki/Category:Suburbs_of_Mumbai)
- Geocoder package for latitude and longitude coordinates
- Foursquare API for venue data

METHODOLOGY



RESULTS

- From the **k-means clustering** we see that, we can categorize the neighborhoods into **3** clusters based on the frequency of occurrence for **"Bakery"**



- The results of the clustering are visualized in the map below with

cluster 0 in red color, cluster 1 in blue color, and cluster 2 in mint green color.

CLUSTERS

- Cluster 0:

Neighborhoods with **moderate number** of Bakery shops

	Neighborhood	Bakery	Cluster Labels	Latitude	Longitude
0	Andheri	0.027027	0	19.118459	72.841763
37	Vashi	0.026316	0	19.084650	72.904810
32	Sion, Mumbai	0.034483	0	19.043410	72.863320
24	Matharpacady, Mumbai	0.035714	0	18.950694	72.827268
22	Mahavir Nagar (Kandivali)	0.068966	0	19.210940	72.841370
40	Western Suburbs (Mumbai)	0.043478	0	19.197010	72.827680
18	Kandivali	0.058824	0	19.211982	72.837573
14	Grant Road	0.026316	0	18.959290	72.831080
12	Ghatkopar	0.027778	0	19.086523	72.909008
41	Worli	0.041667	0	19.007440	72.816880
7	Chembur	0.023810	0	19.062180	72.902410
5	Borivali	0.020408	0	19.229360	72.857510

- Cluster 1:

Neighborhoods with **low to no concentration** of Bakery shops

	Neighborhood	Bakery	Cluster Labels	Latitude	Longitude
6	Charkop	0.125	1	19.20866	72.82612
36	Uttan	0.200	1	26.86634	80.93884

Cluster 2:

- Neighborhoods with **high concentration** of Bakery shops

	Neighborhood	Bakery	Cluster Labels	Latitude	Longitude
29	Pestom sagar	0.000000	2	19.070640	72.902170
30	Seven Bungalows	0.014706	2	19.131342	72.816342
31	Shil Phata	0.000000	2	19.146580	73.040050
2	Baiganwadi	0.000000	2	19.062940	72.926630
33	Sonapur, Bhandup	0.000000	2	19.163940	72.935440
10	Dombivli	0.000000	2	19.212750	73.083240
34	Thakur village	0.000000	2	19.210200	72.875410
35	Tilak Nagar (Mumbai)	0.000000	2	18.996160	72.852790
1	Anushakti Nagar	0.000000	2	19.042830	72.927340
38	Vikhroli	0.000000	2	19.111090	72.927810
39	Wadala	0.000000	2	19.017200	72.858170
28	Mumbra	0.000000	2	19.167632	73.021408
27	Mulund	0.000000	2	19.171830	72.955650
25	Mira Road	0.000000	2	19.265674	72.870681
9	Devipada	0.000000	2	19.224690	72.866050
3	Bandra	0.000000	2	19.054370	72.840170
23	Mankhurd	0.000000	2	19.048530	72.932220
4	Bhandup	0.000000	2	19.145560	72.948560
21	Kurla	0.000000	2	19.064980	72.880690
19	Kanjurmarg	0.000000	2	19.131380	72.935680
17	Kalyan	0.016393	2	18.953937	72.820367
16	Juhu	0.000000	2	19.014920	72.845220
15	Jogeshwari	0.000000	2	19.137920	72.849410
13	Goregaon	0.000000	2	19.164550	72.849460
8	Dahisar	0.000000	2	19.250030	72.859070
11	Eastern Suburbs (Mumbai)	0.000000	2	19.004270	72.855792
26	Mogra Village	0.000000	2	24.375900	75.954570
20	Kausa	0.000000	2	19.127580	72.825390

DISCUSSIONS

- Most of the Bakery shops are concentrated in the so called Old city area of Mumbai, with the highest number in cluster 2 . Bakery shops in cluster 2 are likely suffering from intense competition due to oversupply and high concentration of bakery shops.

- On the other hand, cluster 1 has very low number to no bakery shops in the neighborhoods. This would not be an ideal location to start a bakery shop as it's the New Mumbai area with comparatively lesser footfall

- Cluster 0 represents a great opportunity and high potential areas to open new Baking shops as there is comparatively less competition from existing Bakeries.

RECOMMENDATIONS

- Open new Bakery shops in neighborhoods in cluster 0 with comparatively little to no competition
- Restaurateur with unique selling propositions may want to enter the not explored area with new bakery shops in neighborhoods in cluster 1.
- It is advised to avoid neighborhoods in cluster 2 which already have high concentration of bakery shops and suffering from intense competition.

CONCLUSION

- Therefore to answer the Business problem :

The neighborhoods in cluster 0 are the most preferred locations to open a new bakery shop. The findings of this project will help to capitalize on the opportunities on high potential locations while avoiding overcrowded areas in their decisions to open a new Bakery Shop.

THANK YOU