

# Capstone Project Report

## Opening an Italian Restaurant in Mumbai, India

Final Report

Debjyoti Bardhan

July 2020

# Introduction

- Mumbai is the economic capital of India. It's a bustling multicultural metropolitan city.
- There is immense competition in the city among the different businesses.
- Italian food is very popular - this might be a good business initiative
- **Aim :** To ascertain the best location for a new Italian restaurant in the city of Mumbai



# Business Problem

- Existing Italian restaurants in Mumbai are doing quite well
- Seems like there is enough space for a restaurant dedicated to the Italian cuisine
- Primary question: What is/are the optimal location(s) in Mumbai dedicated exclusively to Italian Cuisine?
- Secondary question: Is there a possibility of expanding the business in the city?

# Data Needed

- Data is needed about:
  - ◆ The different neighbourhoods (or areas) in Mumbai, along with the geospatial data
  - ◆ Location of the different Italian restaurants in the city which already exist
- The data can be obtained by:
  - ◆ Data about neighbourhood obtained from Wikipedia, using BeautifulSoup to scrape
  - ◆ Use Foursquare API queries to get the information of the Italian restaurants in each area

# Methodology

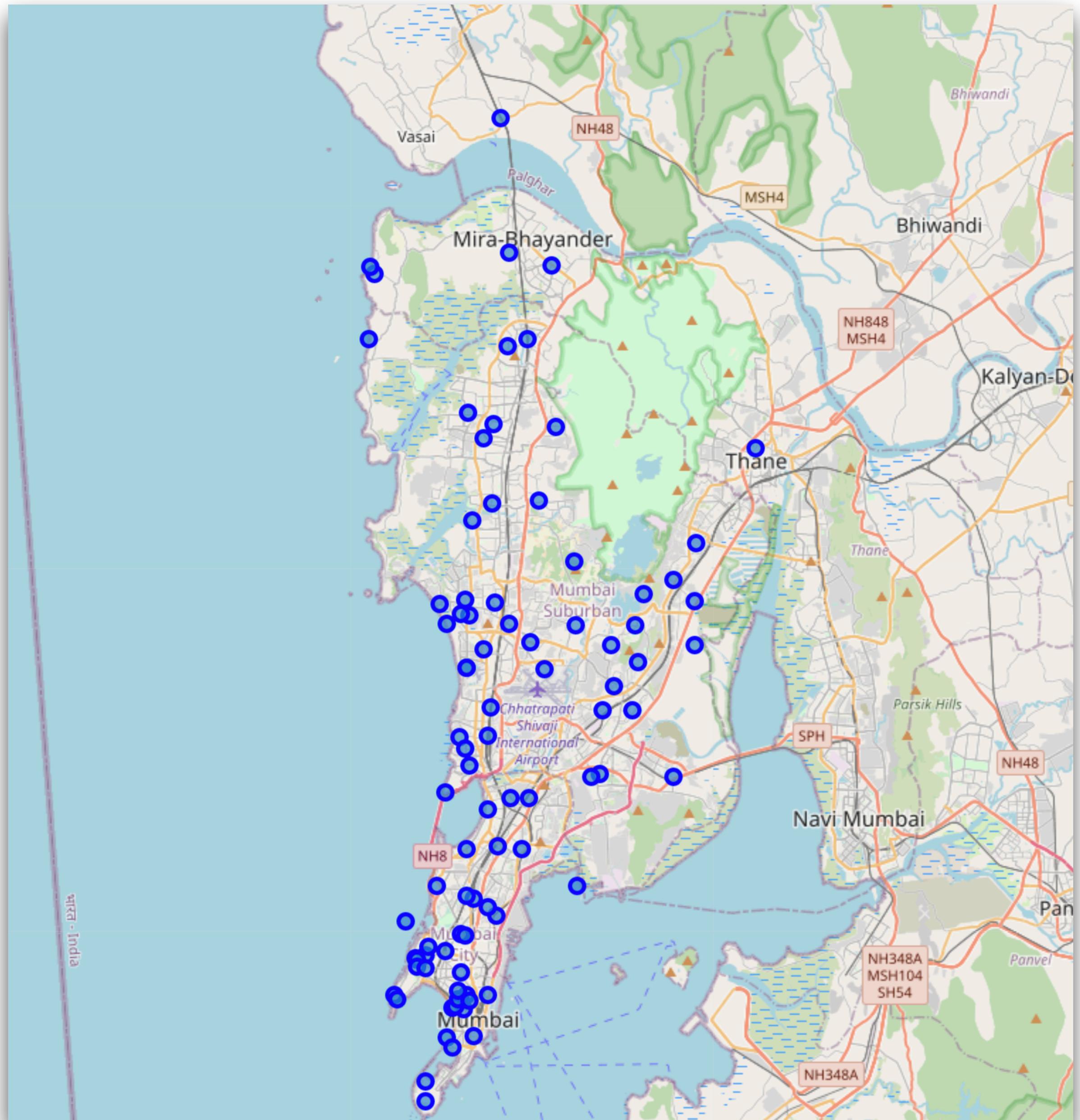
Mumbai neighbourhood coordinates [\[ edit \]](#)

- Source of Data: Wikipedia
- Scrape this using BeautifulSoup package
- Store in a pandas dataframe
- Geospatial data for Mumbai:
  - $19.0760^{\circ}$  N,  $72.8777^{\circ}$  E
- Use this data to visualise the neighbourhoods in Mumbai using the Folium package

Area	Location	Latitude	Longitude
Amboli	Andheri,Western Suburbs	19.1293	72.8434
Chakala, Andheri	Western Suburbs	19.111388	72.860833
D.N. Nagar	Andheri,Western Suburbs	19.124085	72.831373
Four Bungalows	Andheri,Western Suburbs	19.124714	72.82721
Lokhandwala	Andheri,Western Suburbs	19.130815	72.82927
Marol	Andheri,Western Suburbs	19.119219	72.882743
Sahar	Andheri,Western Suburbs	19.098889	72.867222
Seven Bungalows	Andheri,Western Suburbs	19.129052	72.817018
Versova	Andheri,Western Suburbs	19.12	72.82
Mira Road	Mira-Bhayandar,Western Suburbs	19.284167	72.871111
Bhayandar	Mira-Bhayandar,Western Suburbs	19.29	72.85
Uttan	Mira-Bhayandar,Western Suburbs	19.28	72.785
Bandstand Promenade	Bandra,Western Suburbs	19.042718	72.819132

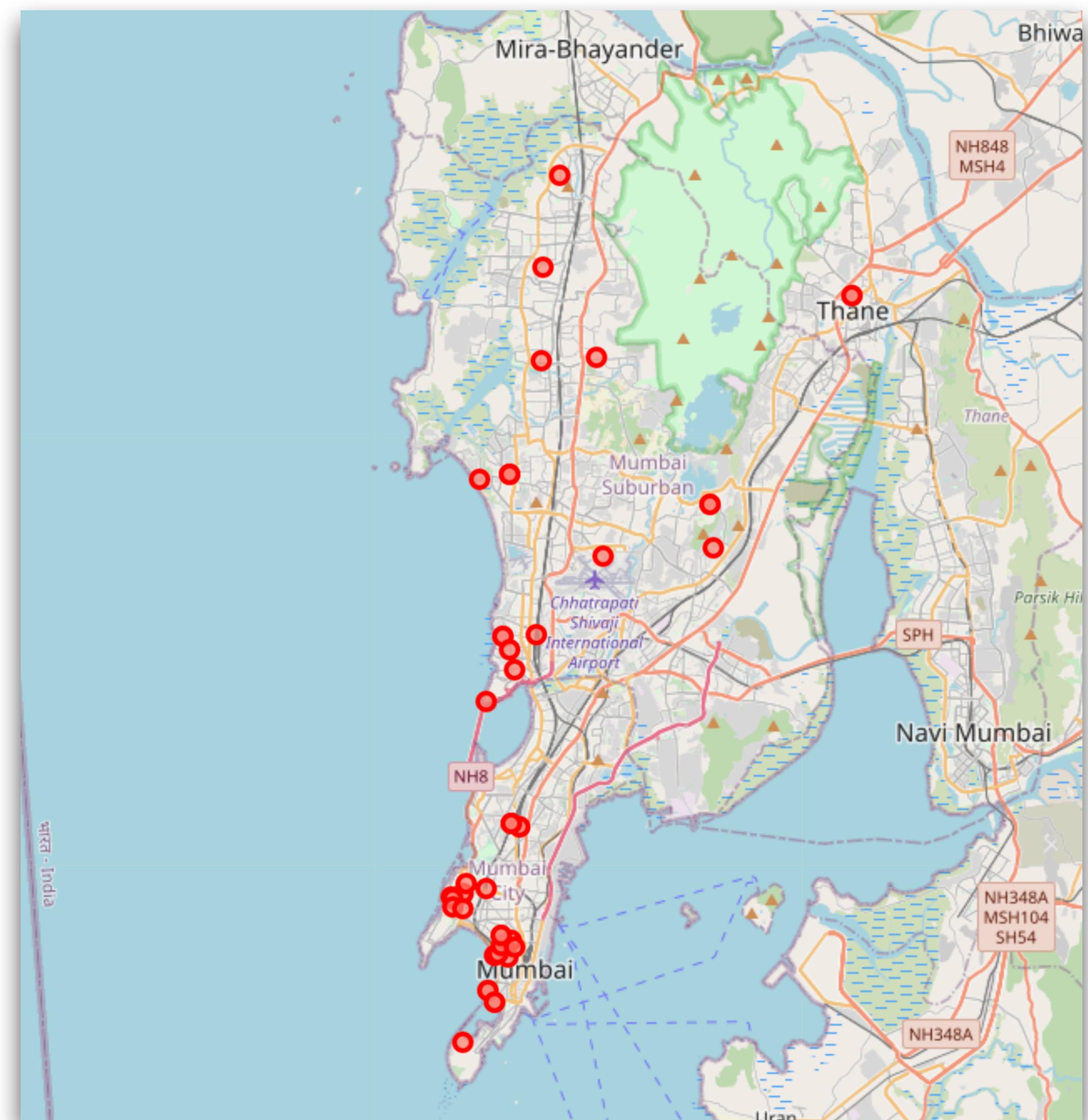
# Areas in Mumbai

- Use Folium to visualise the areas in Mumbai
- Note that there are more areas in the south of Mumbai than in the North. More people live in the south



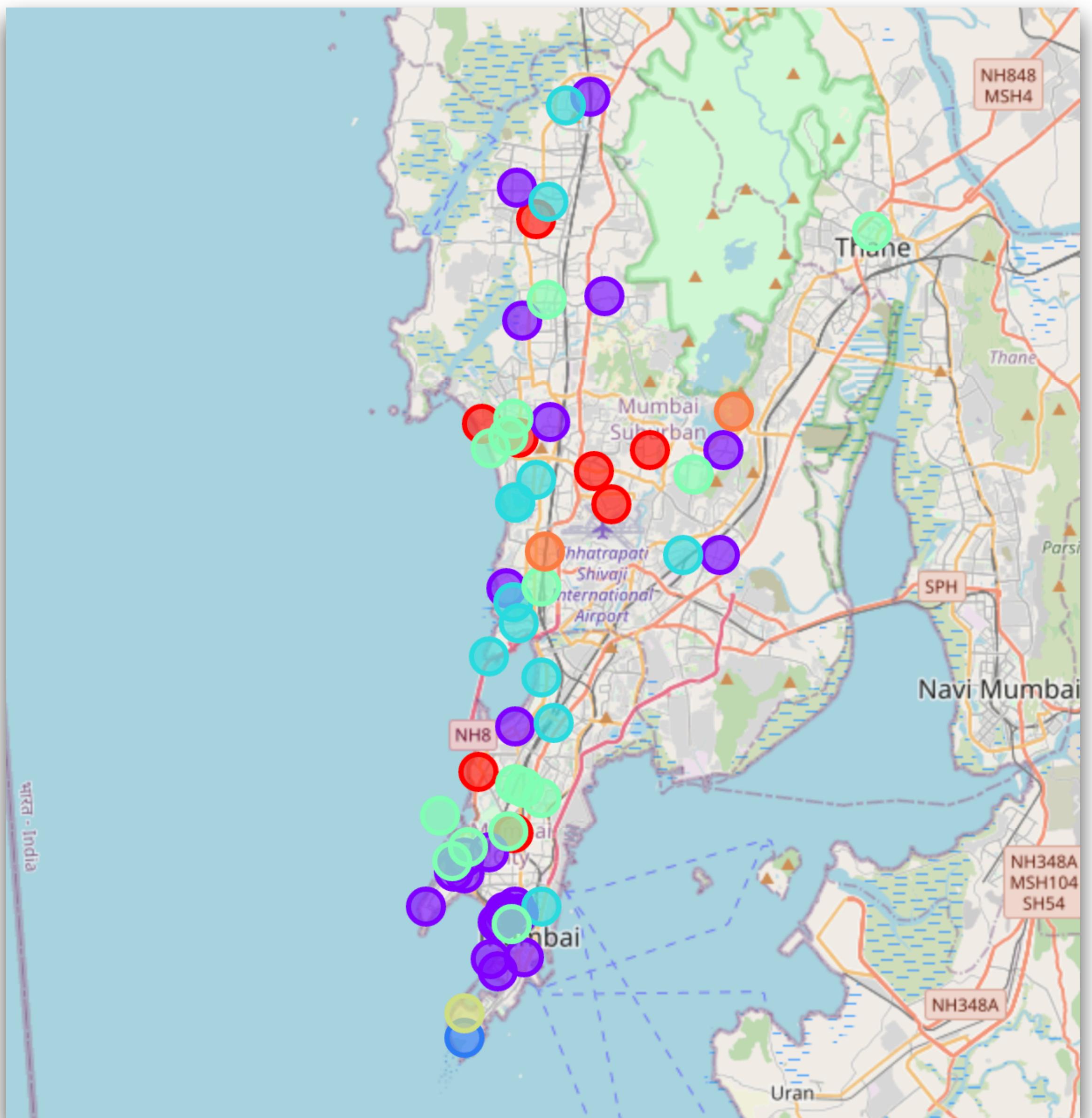
# Italian restaurants in Mumbai

- Use Foursquare API queries to get details of all the establishments in the different areas.
- Get Venue name, category, latitude and longitude for each venue
- Filter out the Italian restaurants and see the distribution of these
- Note that the south have a lot of Italian restaurants already



# k-means clustering

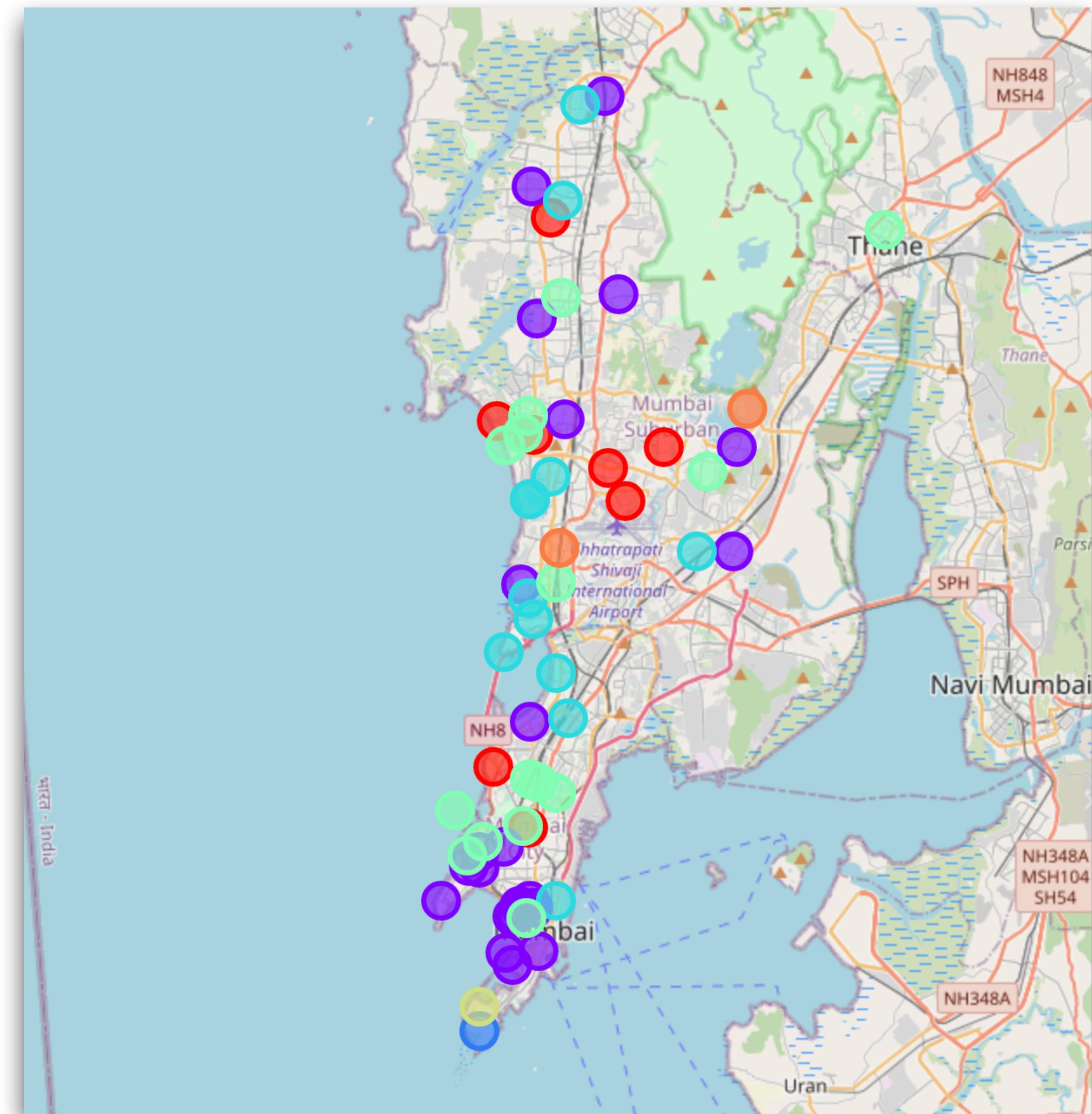
- Use the k-means clustering algorithm to cluster all the areas
- Distinct clusters show mean frequency of the Italian restaurants in the area
- Use  $k=7$ , so 7 different clusters
- Use Folium to visualise the clusters



# The different clusters

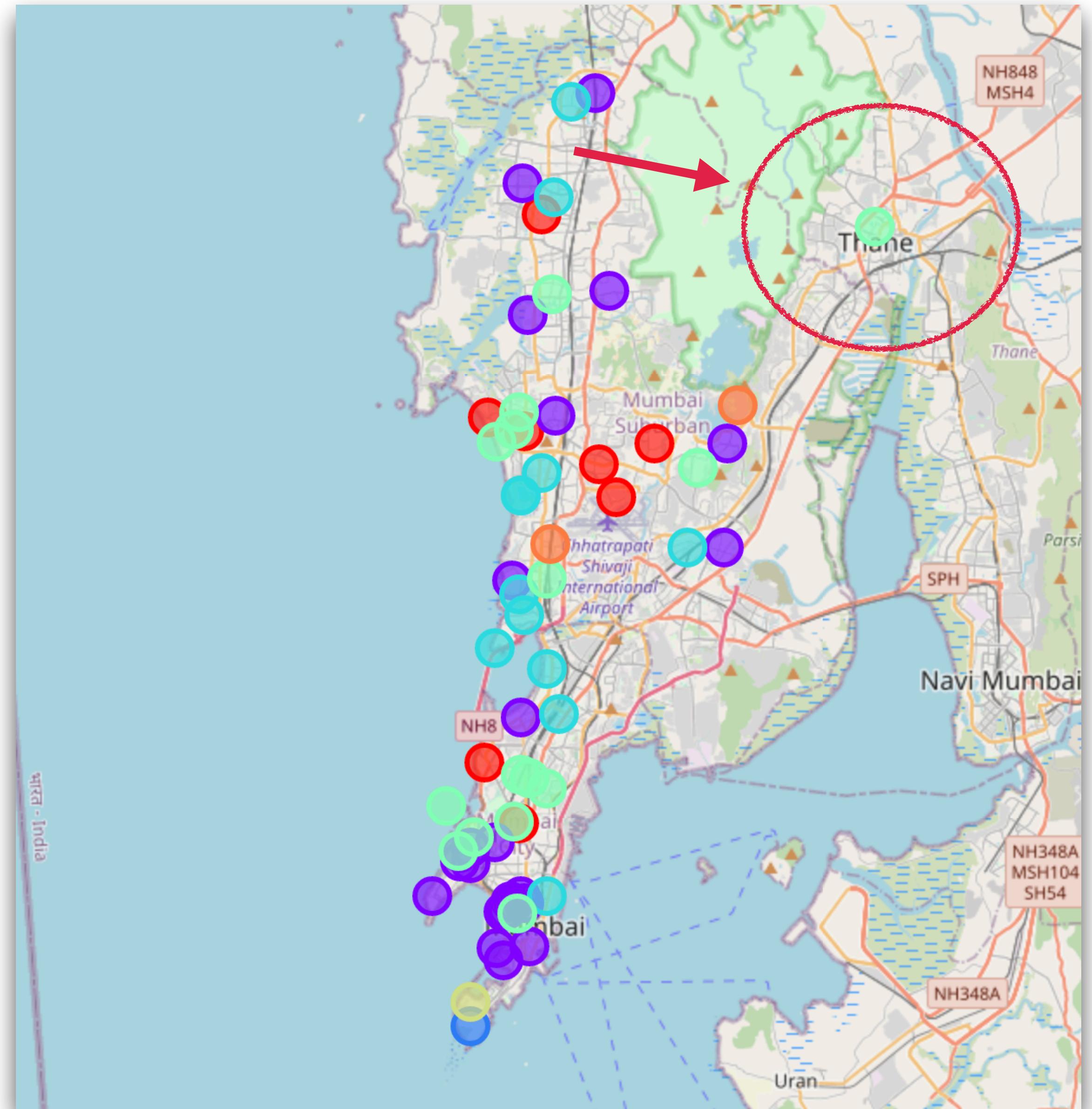
- Details of the clusters as shown in the map

Cluster Number	Typical density of Italian restaurants	Colour in the map	Number of areas in the cluster
0	0.03	Red	8
1	0.01	Purple	24
2	0.1	Blue	1
3	0.02	Teal	12
4	0.045	Light Green	15
5	0.076	Yellow	1
6	0.04	Orange	2



# The different clusters

- Several clusters overlap even to the south of Mumbai
- One area with relatively small number of existing restaurants is Thane (indicated)
- Thane is growing fast in real estate prices
- Thane is a good place to establish a new restaurant



# Conclusion

- Mumbai is a highly competitive market
- One opening is the relative lack of authentic Italian restaurants - existing ones do well
- Aim of this project - find a place to open a new Italian restaurant
- Data : scraped from Wikipedia, then from Foursquare API queries
- Visualisation: Using Folium
- Clustering : k-means clustering using  $k = 7$  clusters
- Suggestion: Thane is a good place to start a new Italian restaurant business

Thank you!