

# **IBM Data Science Capstone Project**

**Exploring Infrastructure and Neighborhood in Mumbai**

January 16 2021

# Introduction

- Mumbai is one of the largest city in India
- Second populous city



<https://www.britannica.com/place/Mumbai>



<https://www.mumbai.org.uk/geographical-location.html>

# Problem Statement

1. Visualize the Mumbai
2. Identify the best infrastructure locations in Mumbai
3. Identify the potential areas for future development in Mumbai
4. Identify the city locations with poor infrastructure in Mumbai
5. Identify the best place to live within Mumbai

# Target Audience

- This project will help newcomers in exploring Mumbai City and its neighborhood. It will help people to make a decision for finding the best infrastructure place to stay in the city.

# Data

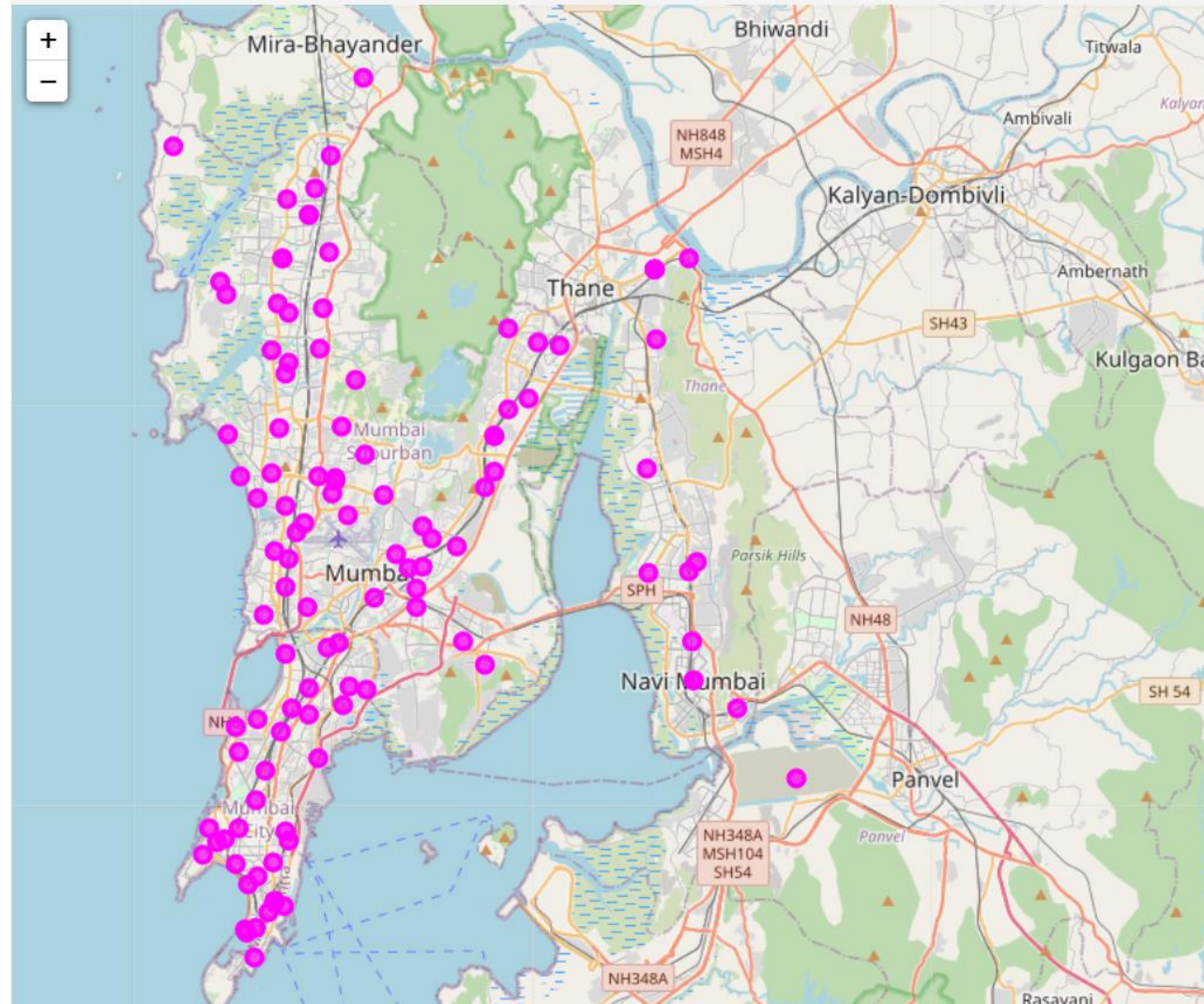
- Pin code : <https://mumbai7.com/postal-codes-in-mumbai/>. It has city, postal office, and pin code information's. Latitude and longitude information are added using google map manually.
- Different kinds of infrastructures in each neighborhood of Mumbai City: Foursquare API
- Program: Python 3.7

# Method

1. Data cleaning
2. Data wrangling and map visualization
3. K-means clustering to identify the neighborhood

# Results

## Location of infrastructure in Mumbai



# Results

## Best infrastructure details in Mumbai

Post Office	Bandra (West)
Pin Code	400050
City	Mumbai
Airport Terminal	0
Bank	0
Bus Station	0
Business Service	0
Café	10
College Auditorium	1
Electronics Store	1
Farmers Market	1
Garden	0
Government Building	0
Gym / Fitness Center	3
Hotel	1
Indie Movie Theater	1
Light Rail Station	0
Market	0
Monument / Landmark	0
Park	1
Pharmacy	0
Playground	0
Resort	0
Restaurant	1
Shopping Mall	1
Theater	0
Train Station	0
Total infrastructure	21



# Results

## Poor infrastructure details in Mumbai

Post Office	Pin Code	City
Agashi	401301	Thane
Anu Shakti Nagar	400094	Mumbai
Bassien	401201	Thane
Bhandup (East)	400042	Mumbai
Bhayander (East)	401105	Thane
Boisar	401501	Thane
Ghansoli	400701	Navi Mumbai
Jacob Circle	400011	Mumbai
Jakegram	400606	Thane
Jawhar	401603	Thane
Kopri Colony	400603	Thane
Krishi Utpanna Bazar	400705	Navi Mumbai
Mahim	400016	Mumbai
Nerul Mode	400706	Navi Mumbai
Santacruz P&T Colony	400029	Mumbai
Sopara	401203	Thane
Tagore Nagar	400083	Mumbai
Talasari	401606	Thane
Umbarpada	401102	Thane
Uran	400702	Navi Mumbai
Vasai East I/E	401208	Thane
Wadala	400031	Mumbai

# Results

## Best infrastructure details in Mumbai

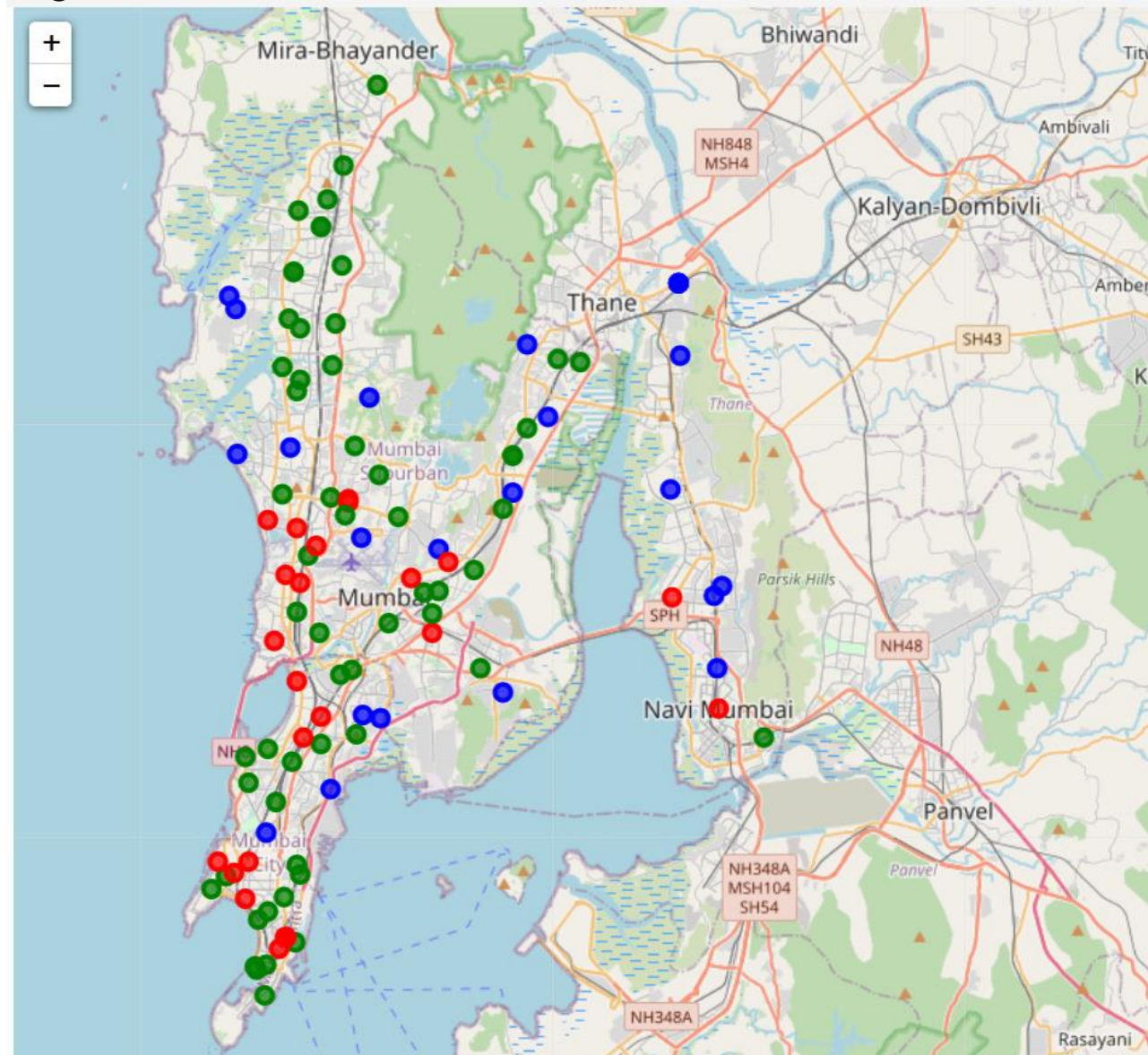
Infrastructures
Airport Terminal
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Light Rail Station
Market
Monument / Landmark
Park
Pharmacy
Playground
Resort
Train Station

## Best postal office locations details in Mumbai

Pin Code	Latitude	Longitude	Post Office
400065	19.15613	72.870722	Aarey Milk Colony
400708	19.17298	73.003532	Airoli Mode
400069	19.11588	72.854202	Andheri (East)
400058	19.11725	72.833968	Andheri (West)
400037	19.02076	72.865256	Antop Hill

# Results

Clustering based on total number of infrastructures in Mumbai.



Cluster 1 (Blue): Neighborhoods with a low number of infrastructures

Cluster 0 (Red): Neighborhoods with a high number of infrastructures

Cluster 2 (Green): Neighborhoods with a moderate number of infrastructures

# Discussion

- Most of the infrastructures are located in Southern part of the Mumbai (see cluster 0, red color).
- The least infrastructures are located in Eastern part of the Mumbai (see cluster 2, blue color).
- We show that the eastern part of Mumbai has potential for future development.

# Conclusions

- In this project, we explore the Mumbai City and its neighborhood. This will help people to make a decision for finding the best infrastructure place to stay in the city.

**Thank you**