# Battle of Neighbourhood

Abhilash Ramesan

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# Introduction

➢Mumbai, Pune and Nagpur are the three most famous cities of the state of Maharashtra

➢We want to explore how much they are similar or dissimilar in aspects from a resident point of view regarding food, accommodation, beautiful places, and many more.

➢We will be exploring the following cities and tries to understand what is popular in them and what they have to offer to someone who is contemplating to make a choice on seeking a life in either of the metro cities

➢The deciding factor for most would be on how lively, supportive, vibrant and unique each of the cities can be when compared to each other

➢The decision to choose one over the other would depend on popular venues in the neighborhoods in each of these metro cities.

# Data

➢Pin code Data :-

▪ https://data.gov.in/resources/all-india-pincode-directory-contact-details-along-latitude-and-longitude

➢Latitude/Longitude of neighborhoods :-

▪ *Nominatim* library from geopy.geocoders

➢Nearby Venues of neighborhoods:-

▪ *FourSquare* API

 Data selection & cleaning

- Select data for Mumbai, Pune and Nagpur

- Remove unwanted columns

- Remove duplicate pin codes

- Remove rows with no latitude/longitude

# Method

1. One Hot Encoding of Data

2. Find Top 10 Venues for each neighborhood

3. K mean clustering to find common clusters in each city

4. Assign a cluster label to each cluster

5. Compare cluster for similarity and disimilarity in each cities

# Results – Clusters

## Mumbai Cluster Data

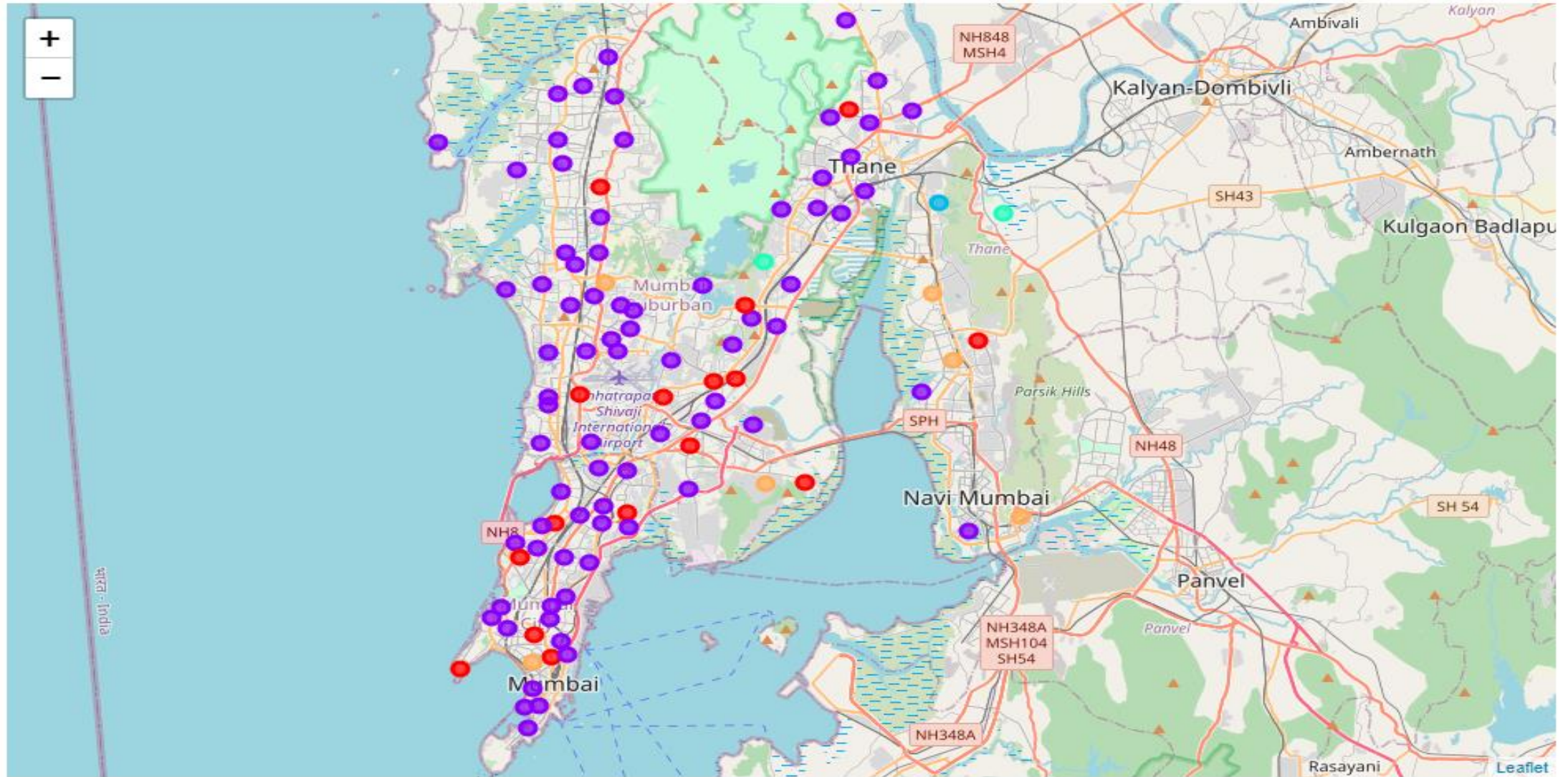| | pincode | regionname | latitude | longitude | Neighborhood | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8t Co |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 400037 | Mumbai | 19.023074 | 72.867622 | Antop Hill S.O | 0 | Construction & Landscaping | Indian Restaurant | Grocery Store | Zoo | Farm | Food & Drink Shop | Food | |
| 1 | 400003 | Mumbai | 18.951606 | 72.834797 | B.P.Lane S.O | 0 | Indian Restaurant | Convenience Store | Flea Market | Middle Eastern Restaurant | Dessert Shop | American Restaurant | Ice Cream Shop | Res |
| 2 | 400012 | Mumbai | 19.000795 | 72.840147 | BEST STaff Quarters S.O | 1 | Indian Restaurant | Gym / Fitness Center | Bar | Park | Multicuisine Indian Restaurant | Pharmacy | Coffee Shop | Play |
| 3 | 400009 | Mumbai | 18.959645 | 72.838526 | Chinchbunder H.O | 1 | Mini Golf | Indian Restaurant | Harbor / Marina | Furniture / Home Store | Café | Brewery | Fast Food Restaurant | Foo |
| 4 | 400033 | Mumbai | 18.981780 | 72.840388 | Cotton Exchange S.O | 1 | Pizza Place | Hookah Bar | Furniture / Home Store | Arts & Crafts Store | Falafel Restaurant | Food | Flower Shop | |

## Nagpur Cluster Data

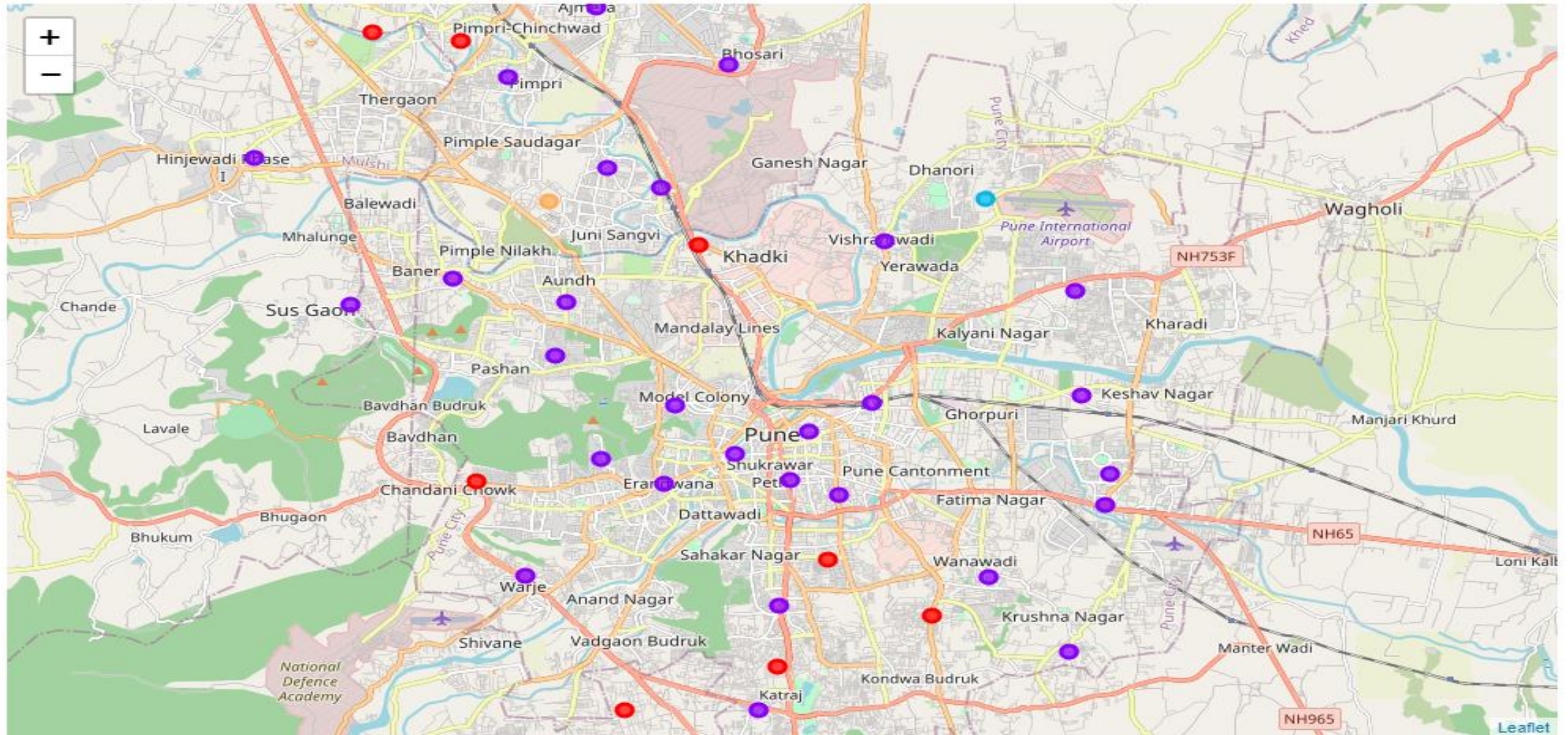| | pincode | regionname | latitude | longitude | Neighborhood | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th Mos Commo Venu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 440010 | Nagpur | 21.133355 | 79.068431 | Abhyankar Nagar S.O | 2 | Gift Shop | Bakery | Gym / Fitness Center | Shopping Mall | Hotel | Park | Outdoors & Recreation | India Restaur |
| 1 | 440003 | Nagpur | 21.124036 | 79.102410 | Ajni S.O | 2 | Pool | IT Services | Business Service | Chinese Restaurant | Wings Joint | Department Store | Garden | Foo Truc |
| 2 | 440024 | Nagpur | 21.120171 | 79.117492 | Ayodhya Nagar S.O | 2 | Garden | Food Court | Wings Joint | Gym / Fitness Center | Gift Shop | Food Truck | Fast Food Restaurant | Dumplin Restaura |
| 3 | 440008 | Nagpur | 21.145063 | 79.129437 | Bagadganj S.O | 2 | ATM | Clothing Store | Department Store | Gift Shop | Garden | Food Truck | Food Court | Fast Foo Restaura |
| 5 | 440014 | Nagpur | 21.166664 | 79.086990 | Bezonbagh S.O | 2 | Mobile Phone Shop | Bakery | History Museum | Playground | Coffee Shop | Garden | Food Truck | Foo Cou |

## Pune Cluster Data

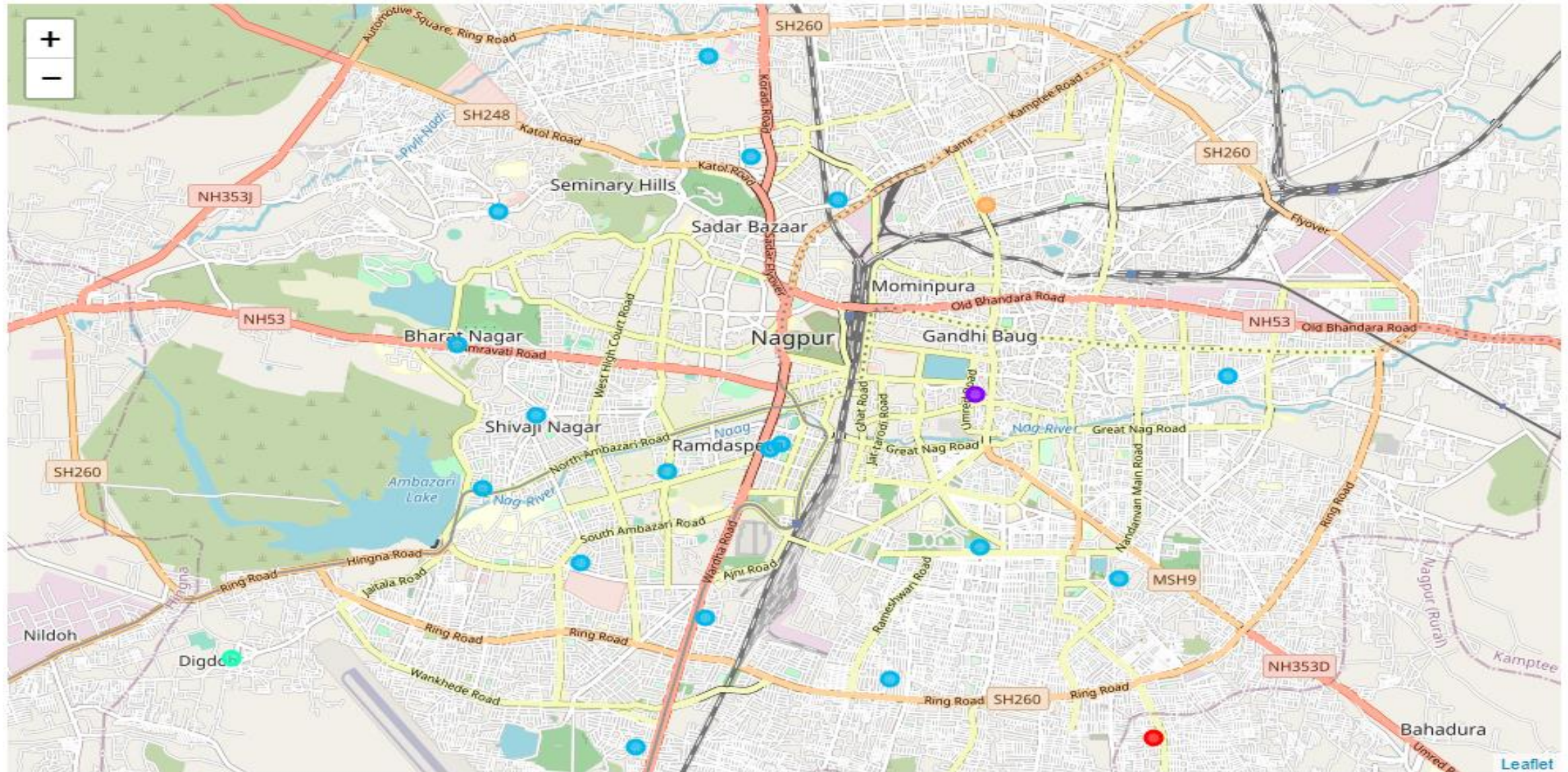| | pincode | regionname | latitude | longitude | Neighborhood | Cluster Labels | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue | 8th M Comm Ve |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 411014 | Pune | 18.559096 | 73.920485 | 9 DRD B.O | 1 | Café | Fast Food Restaurant | Hotel | Pizza Place | Indian Restaurant | Italian Restaurant | Diner | Sand P |
| 1 | 411040 | Pune | 18.484045 | 73.901684 | AFMC S.O | 1 | Café | Italian Restaurant | Wine Shop | Falafel Restaurant | Coffee Shop | Liquor Store | Chinese Restaurant | O G Outd |
| 2 | 411032 | Pune | 18.583178 | 73.900781 | Airport S.O (Pune) | 2 | Recreation Center | Lake | Wine Shop | Dumpling Restaurant | Deli / Bodega | Department Store | Dessert Shop | Dim S Restau |
| 4 | 411003 | Pune | 18.571007 | 73.838327 | Ammunition Factory Khadki S.O | 0 | Chinese Restaurant | Indian Restaurant | Wine Shop | English Restaurant | Department Store | Dessert Shop | Dim Sum Restaurant | D |
| 5 | 411027 | Pune | 18.582607 | 73.805725 | Aundh Camp S.O | 4 | Café | Wine Shop | Dance Studio | Department Store | Dessert Shop | Dim Sum Restaurant | Diner | Disti |

# Results – Visualization – Mumbai City

# Results – Visualization – Pune City

# Results – Visualization – Nagpur City

# Discussion & Conclusion

➤ In a fast moving world, there are many real life problems or scenarios where data can be used to find solutions to those problems.

➤ Like seen in the example above, data was used to cluster neighborhoods in Mumbai, Pune and Nagpur based on the most common venues in those neighborhoods.

➤ The outcome of the project was impacted by the limited effectiveness of the Foursquare API for a city like Mumbai Pune and Nagpur. The way the neighbourhoods were suggested was majorly due to Indian restaurants alone.

➤ The results suggest that this approach would yield insights on common trends between areas. This analysis can be further improved by using more popular source like Google Maps

➤ Similarly, data can also be used to solve other problems, which most people face in metropolitan cities.