



The Battle of Neighbourhood's

SELECTING NEIGHBORHOOD OF PUNE

Introduction - Pune

- Pune is one of the most popular city for living in India
- Pune is IT HUB of India
- Pune has very long history and many historic places
- Pune is the 8th largest metropolis in India
- Pune has very good climate for living

Due to Above reasons Most of the people are relocating to Pune and Pune is becoming popular place for living.

Business Problem

- As most of Neighborhoods are developing simultaneously in Pune
- Its difficult to select the location to purchase a property or area to stay I Pune
- Properties are available to purchase in all Neighborhoods in Pune
- People like to buy or rent a property in the area where they find places of interest nearby

As a Result of above problem I have developed a clusters of Pune based on nearby venues

Data Description

For this project I have used open source data

1. List of Neighborhoods in Pune from Wikipedia

- https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Pune
- https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Pune#Old_city

2. Foursquare API



Methodology

MY PROJECT DETAILS

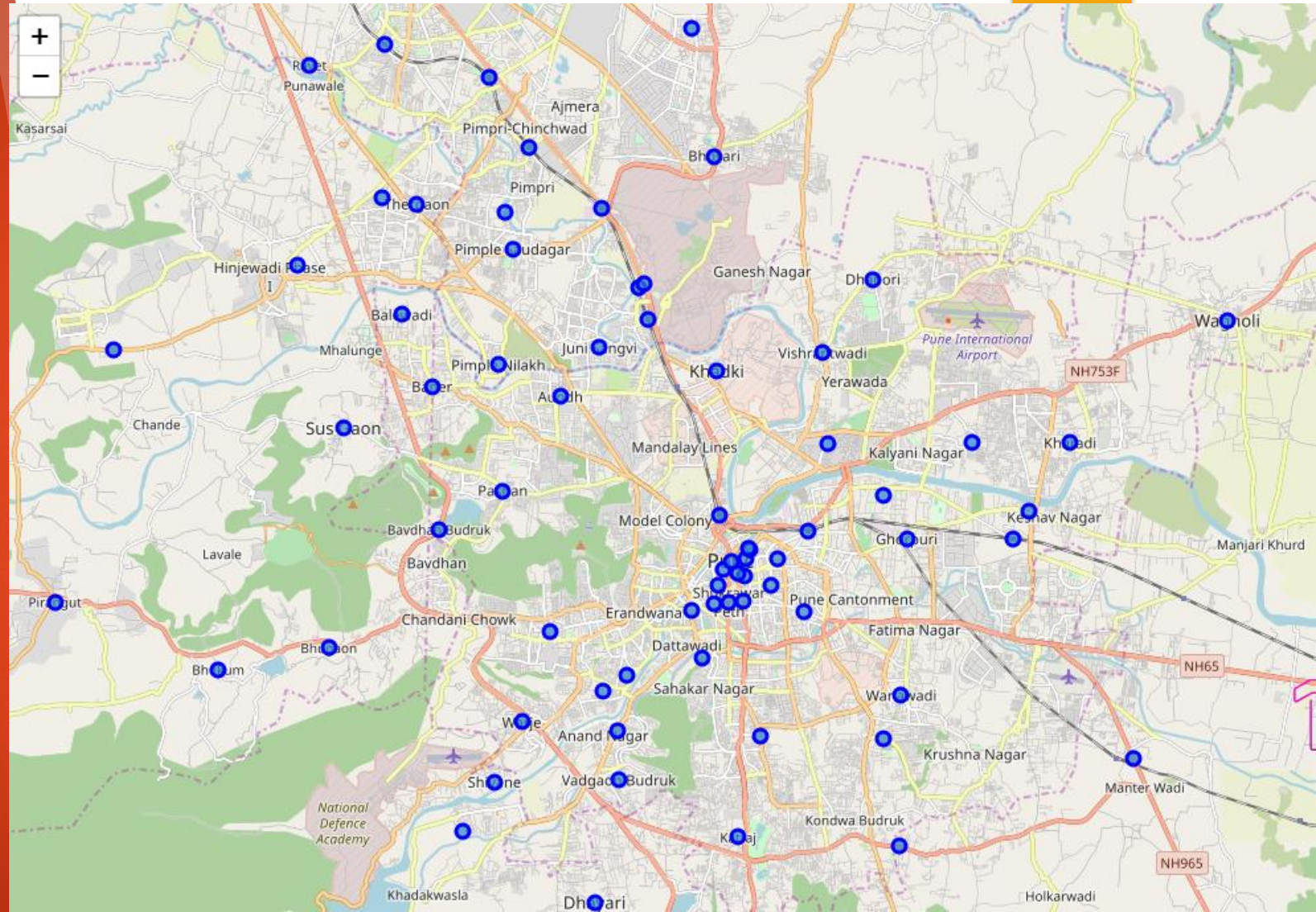
Data Mining

- As a database, I used GitHub repository in my study
- After scrapping, cleaning and combining my Final data contains Neighborhoods, City, Latitude, longitude

Neighbourhood	City	Latitude	Longitude	
0	Kasba Peth	Pune	18.521905	73.858290
1	Guruwar Peth	Pune	18.511359	73.857620
2	Somwar Peth	Pune	18.528877	73.874415
3	Mangalwar Peth	Pune	18.524339	73.859208
4	Shukrawar Peth	Pune	18.511354	73.854011

Map of Pune

Using python folium library to visualize geographic details, I plotted all Neighborhoods on map of Pune.



Neighbourhood Venues

- ▶ I utilized the Foursquare API to explore the neighborhood and segment them. I designed the limit as **100 venue** and the radius **500 meter** for each neighborhood from their given latitude and longitude information. Here is a head of the list Venues name, category, latitude and longitude information from Foursquare API.

Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Kasba Peth	18.521905	73.85829	Lal Mahal	18.518720	73.856556	Historic Site
Kasba Peth	18.521905	73.85829	Shaniwar Wada	18.520151	73.855187	Historic Site
Guruwar Peth	18.511359	73.85762	Raja Dinkar Kelkar museum	18.510744	73.854389	History Museum
Guruwar Peth	18.511359	73.85762	Shrikrishna Bhuvan	18.513494	73.855074	Snack Place

Preprocessing

- I found total 487 Neighborhoods
- I grouped venues by Neighborhood
- Performed One-Hot Encoding to get Numeric values
- Cleaned the data
- In summary of this graph **102** unique categories were returned

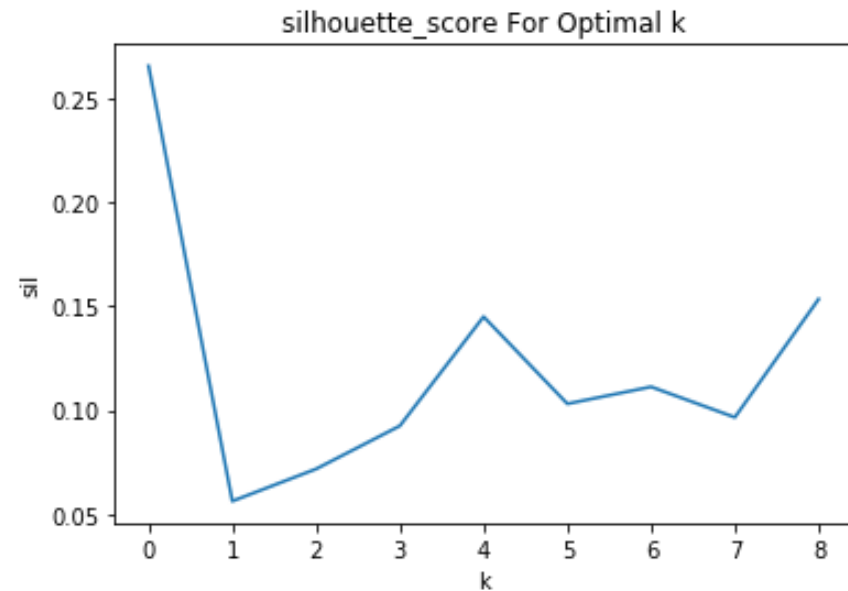
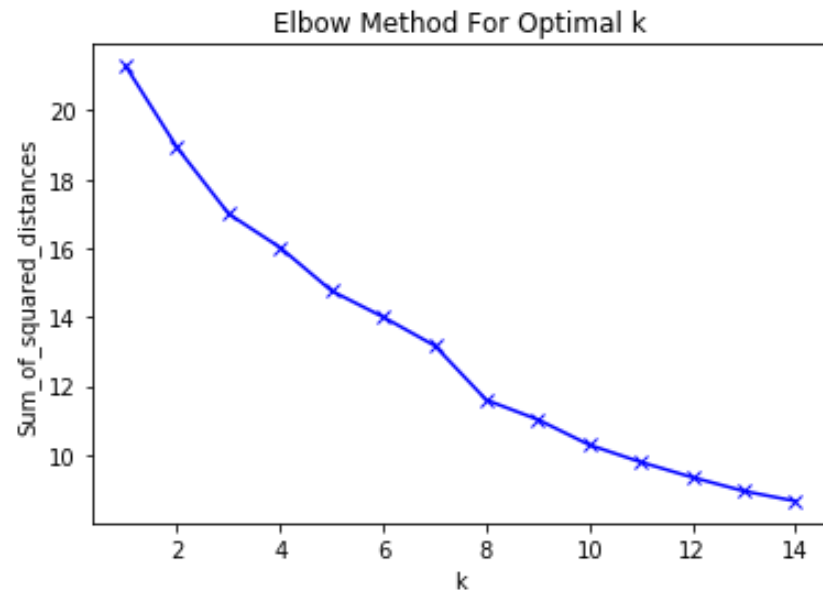
Most Common Venues

- ▶ I created a table which shows list of top 10 venue category for each borough in below table.

	Neighbourhood	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	Akurdi	Indian Restaurant	Fast Food Restaurant	Café	Train	Asian Restaurant	Tea Room	Bakery	Platform	Snack Place	Middle Eastern Restaurant
1	Aundh	Indian Restaurant	Fast Food Restaurant	Sporting Goods Shop	Snack Place	Shopping Mall	Breakfast Spot	Korean Restaurant	Plaza	Coffee Shop	Clothing Store
2	Balewadi	IT Services	Garden	Electronics Store	Falafel Restaurant	Farmers Market	Fast Food Restaurant	Flea Market	Food	Food Court	Food Truck
3	Baner	Indian Restaurant	Fast Food Restaurant	Café	Ice Cream Shop	Health & Beauty Service	Convenience Store	Grocery Store	Motorcycle Shop	Snack Place	Zoo

K- Means Clustering : Finding K

- ▶ To use K-Means in a best way I used 2 models to find the best value of K
 - Elbow Method
 - Silhouette Score Method



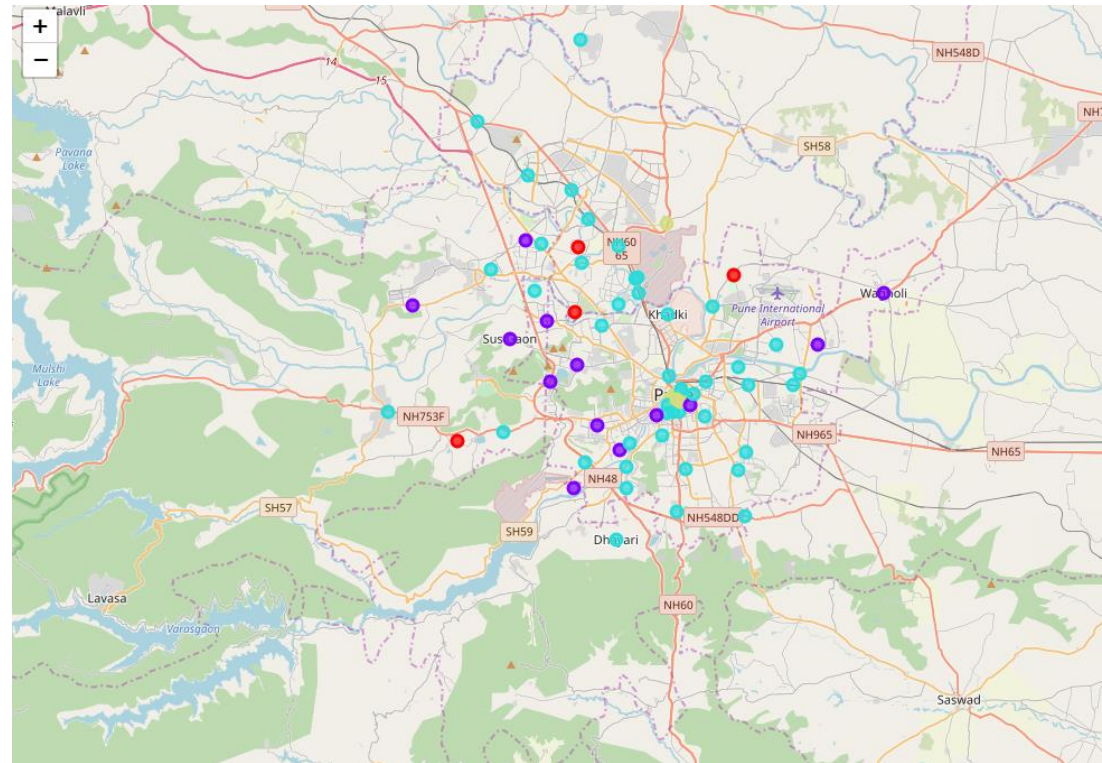
K Means - Clustering

► My final data after Clustering :

	Neighbourhood	City	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	Kasba Peth	Pune	18.521905	73.858290	3.0	Historic Site	Zoo	Garden	Electronics Store	Falafel Restaurant †	Farmers Market	Fast Food Restaurant †	Flea Market	Food	Food Court
1	Guruwar Peth	Pune	18.511359	73.857620	2.0	Vegetarian / Vegan Restaurant †	Dessert Shop	History Museum	Fruit & Vegetable Store	Ice Cream Shop	Indian Restaurant †	Flea Market	Jewelry Store	Mobile Phone Shop	Snack Place
2	Somwar Peth	Pune	18.528877	73.874415	2.0	Hotel	Platform	Movie Theater	Indian Restaurant †	Clothing Store	Fast Food Restaurant †	Gastropub	Seafood Restaurant †	Lounge	Dessert Shop
3	Mangalwar Peth	Pune	18.524339	73.859208	2.0	Coffee Shop	Zoo	Garden	Falafel Restaurant †	Farmers Market	Fast Food Restaurant †	Flea Market	Food	Food Court	Food Truck
4	Shukrawar Peth	Pune	18.511354	73.854011	2.0	Dessert Shop	Vegetarian / Vegan Restaurant †	Men's Store	Ice Cream Shop	Indian Restaurant †	Jewelry Store	Miscellaneous Shop	Breakfast Spot	Snack Place	Road

Map of Clusters

I made clustered of neighborhoods of Pune as shown in picture



Result

- As result I got 4 clusters of Pune based on different venue categories
- After analysis clusters are named as below
 1. Cluster 1 : Village Places
 2. Cluster 2 : Traditional places
 3. Cluster 3 : Modern places
 4. Cluster 4 : Historic places

Discussion

- Based on Result people can select their choice of location to stay, rent or purchase any property in Pune.
- 1. People who like traditional food (Mainly Indian), parks and flea market in nearby areas can choose areas in Traditional cluster
- 2. People who like modern living with pubs, cafes and mall nearby can choose areas in Modern cluster
- 3. People who are workers or students of History who like historical places and major markets around them can choose Historical cluster
- 4. People who want to stay away from the city life can select village cluster

Conclusion

- Platforms like this can help people relocating and selecting their choice of Neighborhood in Pune
- As a result, people are turning to big cities to start a business or work. For this reason, people can achieve better outcomes through their access to the platforms where such information is provided.

References

1. https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Pune#Old_city
2. https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Pune
3. Foursquare API
4. VS code



Thank You

- APURV GHOLAP