



EXPLORING NEIGHBOURHOODS OF MUNICH

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Problem Statement

- To recommend the best neighborhood to relocate to in Munich (Germany)
- To understand the similarities and differences between the neighborhoods using Unsupervised K-Mean Clustering Algorithm

Objective

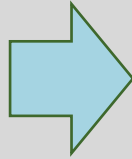
- Collecting the top trending venues in the using Foursquare API(Beautiful Soup, [http request](#))
- Forming neighborhood clusters based on venue categories using unsupervised k-mean clustering algorithm(sklearn)
- Identifying and understanding the similarities and differences between two chosen neighborhoods to retrieve more insights and compare the same with the users home town

Python packages used

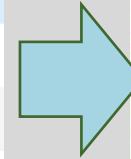
- Pandas - Library for Data Analysis
- NumPy - Library to handle data in a vectorized manner
- JSON - Library to handle JSON files
- Geopy - To retrieve Location Data
- Requests - Library to handle http requests
- Matplotlib - Python Plotting Module
- Sklearn - Python machine learning Library
- Folium - Map rendering Library

Web Scrapping and Data Wrangling

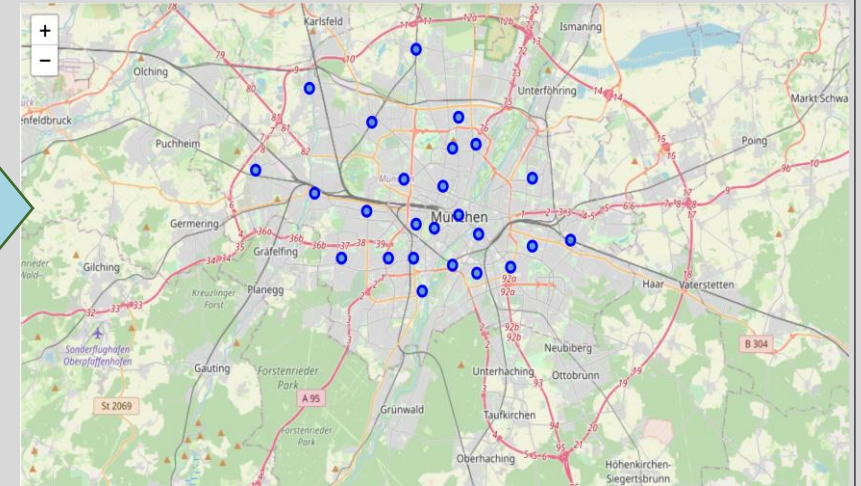
	Borough
0	Altstadt-Lehel
1	Ludwigsvorstadt-Isarvorstadt
2	Maxvorstadt
3	Schwabing-West
4	Au-Haidhausen



	Borough	Latitude	Longitude
0	Altstadt-Lehel	48.137828	11.574582
1	Ludwigsvorstadt-Isarvorstadt	48.131771	11.555809
2	Maxvorstadt	48.151092	11.562418
3	Schwabing-West	48.168271	11.569873
4	Au-Haidhausen	48.128753	11.590536



Folium Visualization for
Munich Boroughs/Neighborhood

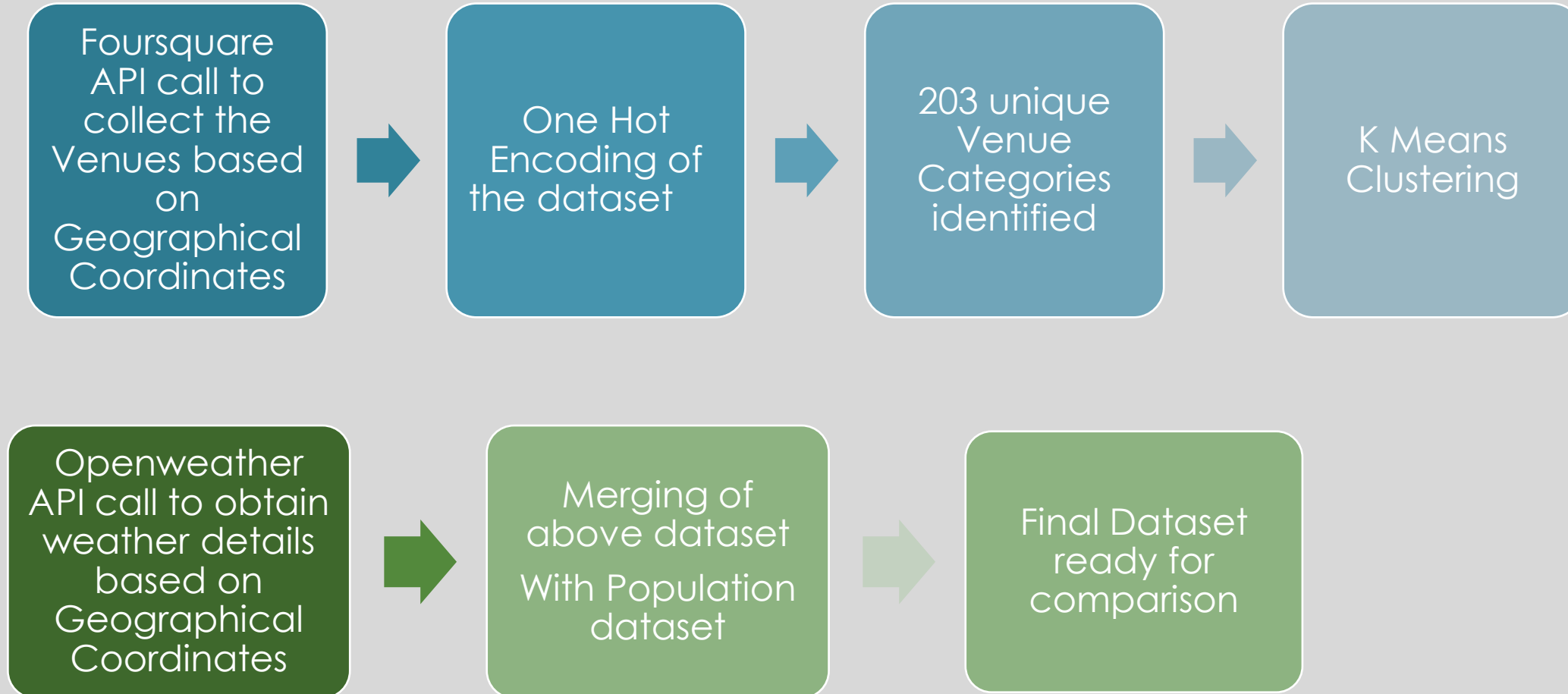


- All 25 Boroughs of Munich were obtained and their Latitude and Longitude (Geographical Coordinates) were obtained and visualized
- Population (Germans and Expats) scrapped for every Borough of Munich

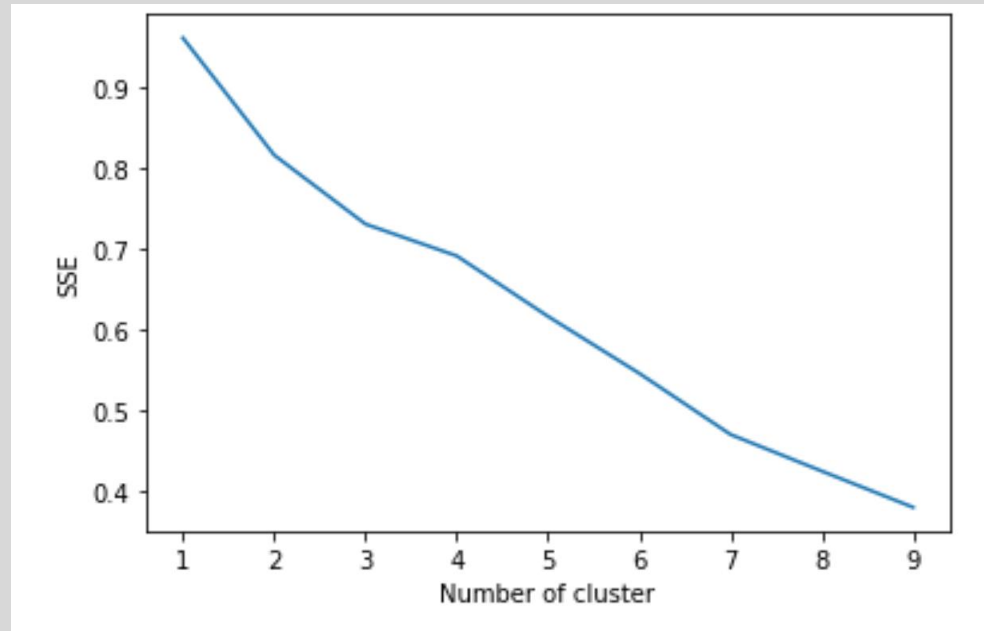
	Borough	German	Others	Total	%_of_Expats
0	Milbertshofen-Am Hart	44473	30621	75094	40.78
1	Ramersdorf-Perlach	76902	39425	116327	33.89
2	Schwanthalerhöhe	19775	9968	29743	33.51
3	Feldmoching-HasenbergI	41737	20037	61774	32.44
4	Berg am Laim	31396	14702	46098	31.89

Methodology

Top 10 venues

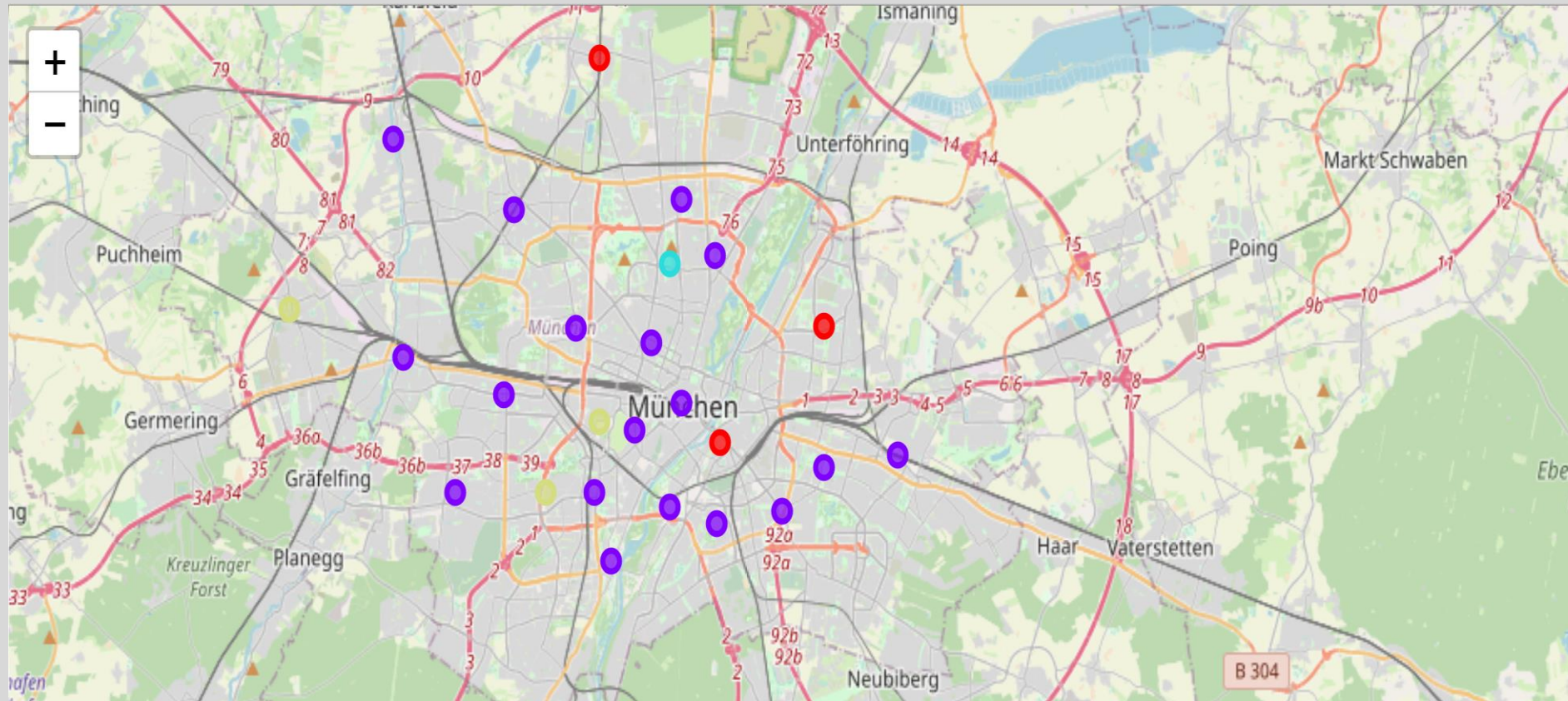


Elbow Criteria



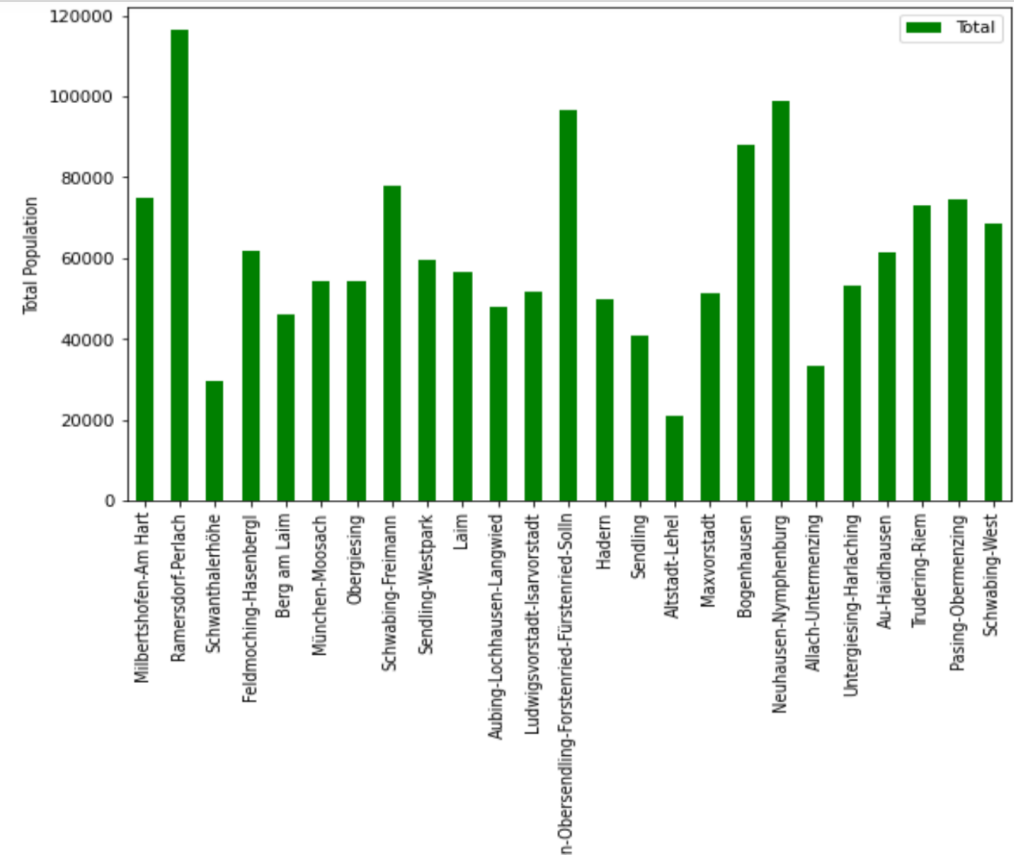
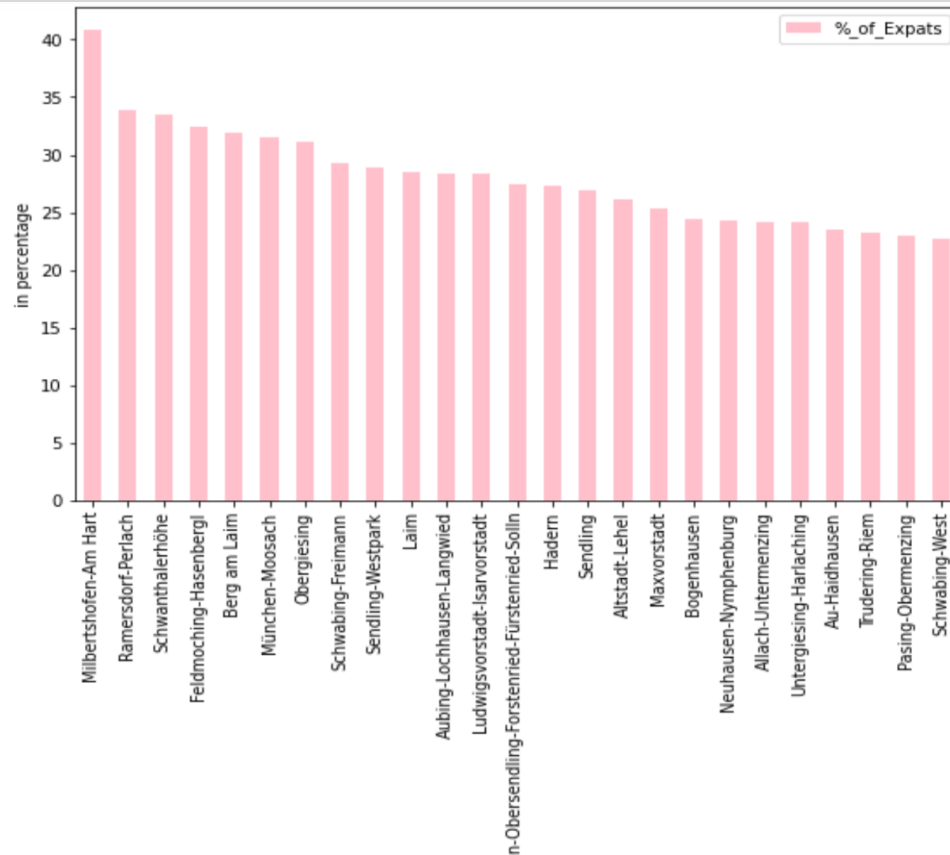
Elbow method is to run k-means clustering on a given dataset for a range of values of k and for each value of k and calculate sum of squared errors (SSE).

Cluster Neighbourhood



**4 Clusters
Identified**

Population visualisation of Boroughs



Top 5 Neighbourhoods based on Population preference

	Borough	German	Others	Total	%_of_Expats	Cluster Labels
0	Milbertshofen-Am Hart	44473	30621	75094	40.78	1
1	Ramersdorf-Perlach	76902	39425	116327	33.89	1
2	Schwanthalerhöhe	19775	9968	29743	33.51	3
3	Feldmoching-Hasenberg	41737	20037	61774	32.44	0
4	Berg am Laim	31396	14702	46098	31.89	1

Comparison of Recommended Neighbourhoods with Hometown

	Laim	Schwanthalerhöhe	Calicut
%_of_Expats	28.47	33.51	NaN
10th Most Common Venue	Motel	Indian Restaurant	Bowling Alley
1st Most Common Venue	Supermarket	Café	Indian Restaurant
2nd Most Common Venue	Italian Restaurant	Hotel	Hotel
3rd Most Common Venue	Doner Restaurant	Bar	Fast Food Restaurant
4th Most Common Venue	Bank	German Restaurant	Clothing Store
5th Most Common Venue	Bakery	Ice Cream Shop	Vegetarian / Vegan Restaurant
6th Most Common Venue	Park	Italian Restaurant	South Indian Restaurant
7th Most Common Venue	Tram Station	Pizza Place	Pizza Place
8th Most Common Venue	Restaurant	French Restaurant	Movie Theater
9th Most Common Venue	Plaza	Burger Joint	Juice Bar
Cluster Labels	1	3	NaN
Latitude	48.1396	48.1338	11.25
Longitude	11.5022	11.5411	75.78
Temp(Celcius)	17.15	17.15	29
Total_Population	56546	29743	608000

3 out of 5 of the Top 5 Boroughs are from **Cluster 1** which are indicating the Boroughs located at the City central and has Museums and Churches.

As compared to the Hometown in India, there will be a pleasant change to the weather as well as the Population density in these Boroughs.

The user can now make a calculated decision on which Borough amongst the top5 in Munich would be ideal for him.



Thank
you!!