

1 Data

Following data will be needed for the project:

- The list of Munich districts
- Latitude and longitude coordinates of the districts
- Venue data, particularly data on restaurants in Munich and their location

2 Sources of data

- The list of Munich districts including their postal codes was downloaded from the website <https://www.muenchen.de/int/en/living/postal-codes.html> and converted into a Microsoft Excel spreadsheet.
- Latitude and longitude coordinates of the districts based on their postal codes were downloaded from the website <https://public.opendatasoft.com/explore/dataset/postleitzahlen-deutschland/table/> as a Microsoft Excel spreadsheet.
- Venue data were obtained through Foursquare API.

3 Data

First, the Microsoft Excel Spreadsheet containing the list of Munich districts and their postal codes in Munich and corresponding districts was converted into a dataframe.

	PostalCode	District
0	80997	Allach-Untermenzing
1	80999	Allach-Untermenzing
2	81247	Allach-Untermenzing
3	80331	Altstadt-Lehel
4	80333	Altstadt-Lehel

The second Microsoft Excel Spreadsheet was converted into a dataframe containing a list of all postal codes in Munich and their coordinates.

	PostalCode	Latitude	Longitude
0	80331	48.135964	11.572905
1	80333	48.145190	11.568744
2	80335	48.145558	11.553952
3	80336	48.132633	11.554171
4	80337	48.126389	11.558385

Both dataframes have been merged, resulting in a dataframe “munich_df” containing coordinates of every district in Munich.

	PostalCode	Latitude	Longitude	District	Neighborhood
0	80331	48.135964	11.572905	Altstadt-Lehel	Altstadt-Lehel
1	80333	48.145190	11.568744	Altstadt-Lehel	Altstadt-Lehel
2	80335	48.145558	11.553952	Schwanthalerhöhe	Schwanthalerhöhe
3	80336	48.132633	11.554171	Ludwigsvorstadt-Isarvorstadt	Ludwigsvorstadt-Isarvorstadt
4	80337	48.126389	11.558385	Ludwigsvorstadt-Isarvorstadt	Ludwigsvorstadt-Isarvorstadt

3.1 Obtaining data on venues in Munich

The next step was to obtain data on all Munich venues using Foursquare API. API calls containing coordinates of districts were made to Foursquare. Foursquare returned venue data in a json format. Using a python loop, data on venue name, category and its coordinates were extracted and converted into a pandas dataframe.

	District	District Latitude	District Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Altstadt-Lehel	48.135964	11.572905	Marienplatz	48.137125	11.575483	Plaza
1	Altstadt-Lehel	48.135964	11.572905	Asamkirche (St. Johann Nepomuk)	48.135053	11.569746	Church
2	Altstadt-Lehel	48.135964	11.572905	Galeria Gourmet	48.137432	11.573217	Gourmet Shop
3	Altstadt-Lehel	48.135964	11.572905	Viktualienmarkt	48.135296	11.576368	Farmers Market
4	Altstadt-Lehel	48.135964	11.572905	Kustermann	48.136242	11.574897	Department Store

The following steps will be to cluster the districts and to visualize the data.