

Moving to Düsseldorf, Germany

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1 Introduction

Düsseldorf is a city in the west of Germany with a population of over 600.000. ¹. According to a 2012 quality of living survey it is ranked the sixth most liveable city in the world².

For a new job, I consider moving to the city of Düsseldorf, Germany. I have been there a couple of times, but mainly in the city centre and therefore do not know much about the living quality of the individual districts and neighbourhoods.

To make a choice on a new apartment, not solely based on the cold facts about said apartment, such as size or rent, but also on the living quality that comes with it in terms of infrastructure, I want to use this project to identify the most appropriate area to move to within the city. This question of living quality is potentially not only interesting to me, but to everyone, who considers moving to Düsseldorf.

1.1 Reasons for choosing to move to Düsseldorf

Apart from the aforementioned overall high living quality, there are more reasons to consider in favour of moving to Düsseldorf:

- It is a business hot-spot in the area, located in the the region North-Rhine Westphalia, Germany's most densely populated region, with a large number of job opportunities;
- it is also a very international city, featuring the third largest Japanese community in Europe, hosting branch offices of hundreds of Japanese companies.
- It is also located near the border to the Netherlands and Belgium.
- The large Düsseldorf Airport (as the name suggests) is located in close proximity to the city and can be reached using the public transport system.

Therefore an in-depth analysis of its rental market combined with clustered infrastructure and transportation system data, is an asset to many people and also businesses, which want to support employees moving to this vibrant city full of opportunities.

1.2 Problem statement

In this concrete case, an apartment is sought, that fulfils the following requirements:

1. Proximity to a tram or train station of less than 500 metre
2. Size at least 50 m²
3. Rent of up to 800 € (not going into the details of German rental prices, this is an appropriate amount excluding additional cost for heat, gas, and water)
4. The neighbourhood should feature an adequate number of restaurants, cafés, and parks. (This requirement will be refined based on the identified clusters)

¹<https://en.wikipedia.org/wiki/D%C3%BCsseldorf>

²<https://mobilityexchange.mercer.com/insights/quality-of-living-rankings>

2 Data used to approach the analysis

2.1 Data and data sources

2.1.1 Geospatial data and meta data of the city districts/neighbourhoods

Düsseldorf is administratively divided into 10 districts with 2 to 8 neighbourhoods each. For my approach I will use the following:

- Boundaries of the neighbourhoods³ and districts⁴ provided by the city of Düsseldorf as geojson data;
- the geolocation of neighbourhoods selected for analysis and clustering using Nominatim and Folium

2.1.2 Infrastructure data on the neighbourhoods

To analyse and cluster the neighbourhoods Foursquare data will be used via the Foursquare API.

2.1.3 Information on apartments

To get an idea of the rental prices of apartments in Düsseldorf, data will be scraped from a popular German rental service website *immobilienscout24.de*⁵. The data scraped will be limited to apartments smaller than 70 m². The data set will be reduced in size using additional requirements within python to limit the number of geolocation requests via *geocoder* using the bing maps API. Based on the locations identified, the number of analysed neighbourhoods will be limited, to stay within the scope of the Foursquare API requests limitations.

2.1.4 Data on public transport

Location data of train and tram stops is provided by the city of Düsseldorf⁶.

2.2 Data usage to address problem

To address the problem stated above, the location of the available apartments, fulfilling the requirements for size and price, and stations will be mapped using folium. The neighbourhoods will be analysed and clustered as was demonstrated in the previous courses. Based on the results two or three potential apartments will be chosen.

³<https://opendata.duesseldorf.de/dataset/stadtbezirksgrenzen-duesseldorf>

⁴<https://opendata.duesseldorf.de/dataset/stadtteilgrenzen-d%C3%BCsseldorf>

⁵<https://www.immobilienscout24.de/Suche/de/nordrhein-westfalen/duesseldorf/wohnung-mieten>

⁶<https://opendata.duesseldorf.de/dataset/bahnh%C3%B6fe-d%C3%BCsseldorf>