# Munich for young families

An analysis based on crime rate, price per square meters and schools

# Motivation

- Young families are moving to Munich
- When choosing the place to live, they base their decision on rectain characteristics
  - Crime Rate
  - Price per square meter
  - Schools
- Analyzing the 25 districts of Munich based on these three characteristics
- Goal: Provide a decision basis for young families when moving to Munich

# Data

- GeoJSON file of Munich containing the coordinates of Munich and the postal codes. → This data is used to visualize the districts (https://www.suche-postleitzahl.org/downloads/)
- Postal codes per district (https://www.muenchen.de/leben/service/postleitzahlen.html)
- Crime rates in Munich (www.muenchen.de)
- Real Estate prices in Munich (price per square meter in euro)(https://suedbayerische-immobilien.de/Immobilienpreise-Muenchen)
- Data about schools in Munich (Foursquare API)

# Methodology

- K-nearest-neighbors algorithm to cluster the districts based on the three characteristics (schools, crime rate, price per square meter)

| | DISTRICT | CRIME | EUROPERSQM | COUNT_SCHOOLS |
|---|---|---|---|---|
| 0 | Allach-Untermenzing | 889 | 5699 | 5 |
| 1 | Altstadt-Lehel | 7868 | 9208 | 6 |
| 2 | Au-Haidhausen | 3407 | 7872 | 7 |
| 3 | Aubing-Lochhausen-Langwied | 1533 | 5396 | 2 |

- Due to large differences, e.g., row 0: 889, 5699, 5 → data has to be normalized before applying the algorithm

# Results

- 4 clusters showing distinguishable values for the characteristics

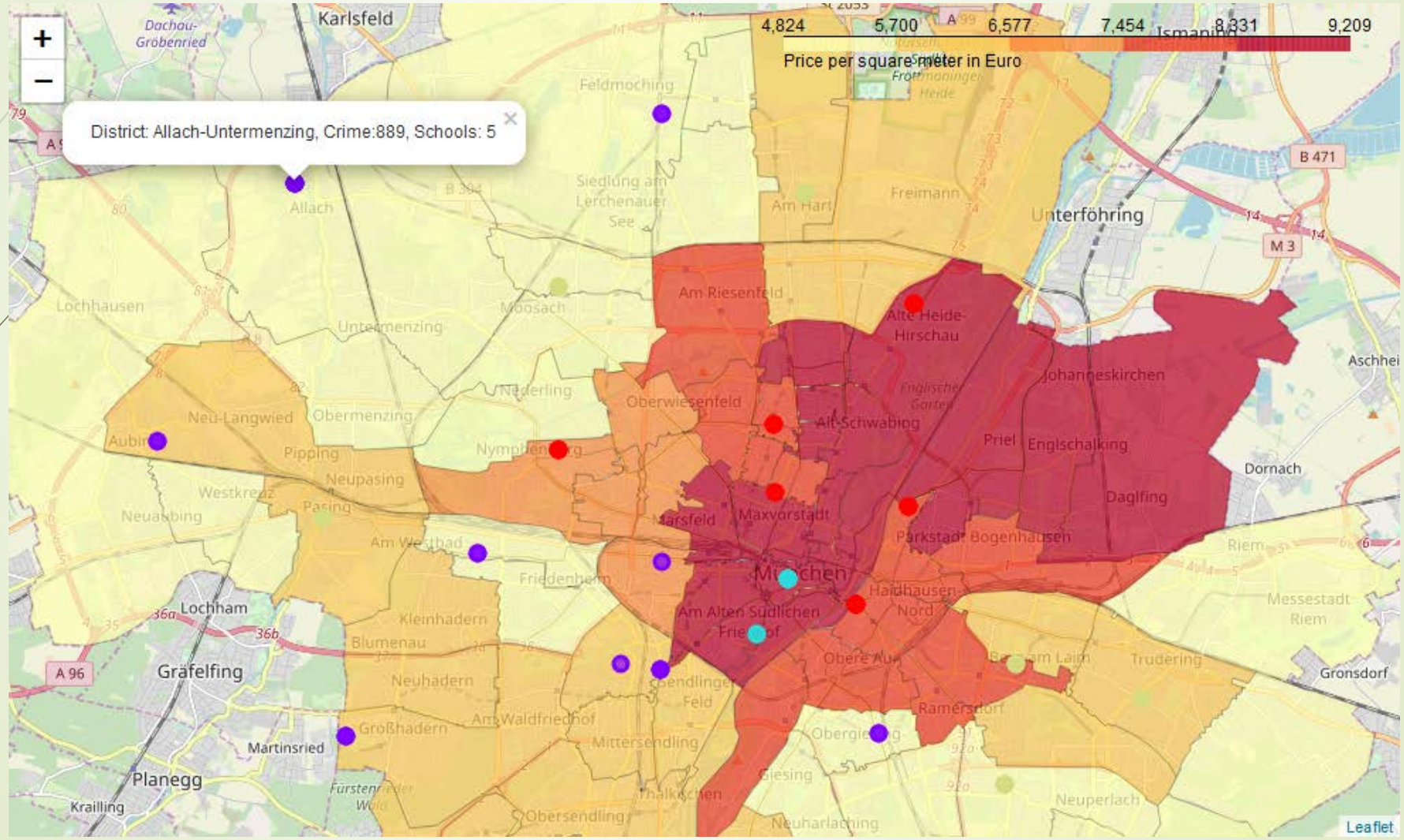
| | DISTRICT | CRIME | EUROPERSQM | COUNT_SCHOOLS | Cluster Labels |
|---|---|---|---|---|---|
| 2 | Au-Haidhausen | 3407 | 7872 | 7 | 0 |
| 5 | Bogenhausen | 2243 | 8399 | 4 | 0 |
| 10 | Maxvorstadt | 4321 | 7968 | 2 | 0 |
| 13 | Neuhausen-Nymphenburg | 3731 | 7419 | 4 | 0 |
| 17 | Schwabing-Freimann | 5273 | 8673 | 5 | 0 |
| 18 | Schwabing-West | 2122 | 7628 | 3 | 0 |

| | DISTRICT | CRIME | EUROPERSQM | COUNT_SCHOOLS | Cluster Labels |
|---|---|---|---|---|---|
| 1 | Altstadt-Lehel | 7868 | 9208 | 6 | 2 |
| 9 | Ludwigsvorstadt-Isarvorstadt | 11818 | 8464 | 2 | 2 |

| | DISTRICT | CRIME | EUROPERSQM | COUNT_SCHOOLS | Cluster Labels |
|---|---|---|---|---|---|
| 0 | Allach-Untermenzing | 889 | 5699 | 5 | 1 |
| 3 | Aubing-Lochhausen-Langwied | 1533 | 5396 | 2 | 1 |
| 6 | Feldmoching-Hasenbergl | 2072 | 4824 | 2 | 1 |
| 7 | Hadern | 1555 | 5991 | 3 | 1 |
| 8 | Laim | 2053 | 5489 | 2 | 1 |
| 14 | Obergiesing-Fasangarten | 2298 | 5364 | 2 | 1 |
| 19 | Schwanthalerhoehe | 1643 | 6964 | 1 | 1 |
| 20 | Sendling | 1784 | 6426 | 3 | 1 |
| 21 | Sendling-Westpark | 2165 | 6008 | 1 | 1 |
| 24 | Untergiesing-Harlaching | 1640 | 6095 | 1 | 1 |

| | DISTRICT | CRIME | EUROPERSQM | COUNT_SCHOOLS | Cluster Labels |
|---|---|---|---|---|---|
| 4 | Berg am Laim | 2579 | 5921 | 3 | 3 |
| 11 | Milbertshofen-Am Hart | 3827 | 5886 | 3 | 3 |
| 12 | Moosach | 2776 | 5643 | 3 | 3 |
| 15 | Pasing-Obermenzing | 3240 | 6061 | 2 | 3 |
| 16 | Ramersdorf-Perlach | 4591 | 5590 | 3 | 3 |
| 22 | Thalkirchen-Obersendling-Fuerstenried-Forstenr... | 2952 | 5852 | 4 | 3 |
| 23 | Trudering-Riem | 2907 | 5549 | 2 | 3 |

# Results




Cluster 1: red  Cluster 2: violet  Cluster 3: turquoise  Cluster 4: beige

# Discussion

- Scenario: family with much money → price per square meter not of high importance
  - choose the district based on crime rate and number of schools
  - Cluster 1
- Scenario: family with less money → price of highest importance
  - Choose the district based on price
  - Cluster 2, 4
- Interesting: In cluster 3, especially in district Altstadt-Lehel, it is the district with the highest crime rate, the most expensive price per square meter and the second highest number of schools.
  - How can this be? Maybe as it is the city center with the best public transportation where people also from the outer regions are taking their kids to school

# Conclusion

- Clustering of districts in Munich based on the characteristics, schools, price per square meter in Euro and crime rate.
- Clustering was performed using the KNN algorithm
- For young families, this analysis serves as a basis to choose the district where a family may want to live
- In further research, additional characteristics can be added, e.g., parks where kids can go out and play, zoos, museums, etc.