

The Battle of Neighborhoods

ABC-Gastronomy GmbH

Introduction

- ▶ Munich Review for ABC-Gastronomy GmbH
- ▶ Best location for Restaurant Business

Business Problem

- ▶ Choice to find the best neighborhood for starting restaurant in Munich
- ▶ Low Competition
- ▶ Low Risk

Success Criteria

- ▶ Meeting the above criteria



Infos about Munich

- Most populous city in Bavaria with about 1.5 million inhabitants
- Multicultural
- Center of culture, politics, science and media
- Home to numerous corporations, including five DAX-listed companies, national and international authorities as well as important universities and colleges, major museums and theatres
- Having monuments and ensembles, international sporting events, trade fairs and congresses as well as the world-famous Oktoberfest

Munich – the Business Environment

- Highly developed city
- Very high competition
- High entry barriers for newcomers
- High costs of running a business
- Consequence: careful location analysis necessary:
 - to keep the risk low
 - to maximize the Return on Investment



Factors that determine the location of a restaurant

- Population and demography
- Are there weekly markets, farms, farmer's markets etc. in the vicinity where you can buy quality goods relatively cheaply?
- Are there places with high population flows nearby, such as fitness centers, swimming pools, entertainment zones, in order to be able to generate a steady stream of walk-in customers?
- How many competitors are there at the location?
- Are the markets saturated or can the markets absorb more competitors?



Data Description

Data on the neighborhoods - 1

Munich consists of 25 boroughs and a total of 107 neighborhoods. In order to segment the boroughs and analyze them more precisely, we essentially need a data set containing the 25 boroughs and the neighborhoods existing in each borough as well as the latitude and longitude of each neighborhood.

The information concerning the boroughs and neighborhoods has been taken from the following publicly accessible websites:

- <https://en.munich.foravisit.com/munich-city/boroughs-neighborhoods/city-centre-old-town/>
- <http://www.total-munich.com/20160623888/blog/moving-to-munich/moving-to-munich-introduction-to-munich-s-boroughs.html>
- https://de.wikipedia.org/wiki/Stadtbezirke_M%C3%BCnchens

Data Description

Data on the neighborhoods - 2

Since no source could be found for the latitudes and longitudes to the boroughs and neighborhoods which contains these data in summary form, I prepared them manually by using the following website to determine the latitudes and longitudes of certain places:

- <https://www.koordinaten-umrechner.de/decimal/51.000000,10.000000?karte=OpenStreetMap&zoom=8>

Data Description

Data on the neighborhoods - 3

	Borough	Neighborhood	Latitude	Longitude
0	Allach Untermenzing	Industriebezirk	48.196839	11.476602
1	Allach Untermenzing	Untermenzing Allach	48.177715	11.472676
2	Altstadt Lehel	Graggenau	48.139168	11.581965
3	Altstadt Lehel	Angerviertel	48.133670	11.571569
4	Altstadt Lehel	Hackenviertel	48.135731	11.569955

Data Description

Data on farmer's and weekly markets - 1

A weekly market is a weekly regular market event where mainly fresh food such as fruit, vegetables, herbs, dairy products, fish, meat and eggs are offered. Farmers' markets are, in contrast to weekly markets, traditional markets where farmers used to do their business and stock up on products for the following year. At farmers' markets, stalls offer food produced by farmers themselves. In contrast to weekly markets, they are basically supplied by producers.

- <https://www.muenchnerwochenmaerkte.de/maerkte/>
- <https://www.wochenmarkt-deutschland.de/maerkte/bayern/wochenmaerkte-in-muenchen/>
- <https://www.muenchner-bauernmaerkte.de/standorte-zeiten.html>
- <https://www.muenchen.de/rathaus/Stadtverwaltung/Kommunalreferat/markthallen/wochenmaerkte.html>

Data Description

Data on farmer's and weekly markets - 2

	Name	Borough	Latitude	Longitude
0	Wochenmarkt in der Au	Au-Haidhausen	48.125800	11.582690
1	Wochenmarkt in Haidhausen	Au-Haidhausen	48.128870	11.596100
2	Wochenmarkt in Bogenhausen	Bogenhausen	48.151520	11.620220
3	Wochenmarkt in Untergiesing	Untergiesing-Harlaching	48.116480	11.570590
4	Wochenmarkt in Schwabing	Schwabing Freimann	48.163130	11.587000
5	Wochenmarkt in Schwabing-West	Schwabing West	48.165044	11.556244
6	Wochenmarkt in Neuhausen	Neuhausen Nymphenburg	48.152930	11.532730
7	Wochenmarkt in der Messestadt Riem	Trudering Riem	48.133140	11.692050
8	Wochenmarkt in Trudering	Trudering Riem	48.112200	11.674900
9	Wochenmarkt in Giesing	Untergiesing-Harlaching	48.110220	11.595670
10	Wochenmarkt in Neuperlach	Ramersdorf Perlach	48.101640	11.640930

Data Description

Data on the population and demography - 1

- https://de.wikipedia.org/wiki/Einwohnerentwicklung_von_M%C3%BCnchen
- <https://www.muenchen.de/>

Population:

	Borough	Square-km	Population	Persons_per_square_km
0	Allach-Untermenzing	1545	31.882	2.063
1	Altstadt-Lehel	315	21.122	6.715
2	Aubing-Lochhausen-Langwied	3406	43.682	1.282
3	Au-Haidhausen	422	61.495	14.574
4	Berg am Laim	631	45.035	7.132
5	Bogenhausen	2371	85.947	3.625
6	Feldmoching-Hasenbergl	2894	61.534	2.126
7	Hadern	922	50.257	5.449
8	Laim	529	55.374	10.476
9	Ludwigsvorstadt-Isarvorstadt	440	54.049	12.280
10	Maxvorstadt	430	53.743	12.540

Data Description

Data on the population and demography - 2

- https://de.wikipedia.org/wiki/Einwohnerentwicklung_von_M%C3%BCnchen
- <https://www.muenchen.de/>

Demographics:

	Country	2000	2005	2010	2015	2018
0	Kroatien	22.009	24.866	23.740	33.177	38.137
1	Türkei	46.329	43.309	40.860	39.204	37.876
2	Italien	22.282	20.847	21.038	27.340	27.821
3	Griechenland	23.523	22.486	20.506	27.117	26.560
4	Österreich	21.938	21.411	20.814	21.944	21.046
5	Bosnien und Herzegovina	14.382	16.475	15.588	17.471	19.692
6	Polen	6.626	12.088	14.697	21.945	19.101
7	Rumänien	4.139	4.161	7.971	18.058	17.980
8	Serbien*	30.514	24.439	15.600	13.389	14.115
9	Bulgarien	1.651	2.858	5.982	12.267	12.575
10	Irak	4.315	8.583	9.931	10.977	12.237

Data Description

Data on venues in the neighborhoods from Foursquare - 1

- Munich geographical coordinates data are utilized as input for the Foursquare API that will be leveraged to provision venues information for each neighborhood
- Use of this API to explore neighborhoods of Munich
- Using the coordinates data from each neighborhood to get top 200 venues in a radius of 1000 meters

Data Description

Data on venues in the neighborhoods from Foursquare – 2

Below there is an image of the Foursquare API data:

	Neighborhood	NeighborhoodLatitude	NeighborhoodLongitude	Venue	VenueLatitude	VenueLongitude	VenueCategory
0	Industriebezirk	48.196839	11.476602	Sport Bittl	48.191447	11.466553	Sporting Goods Shop
1	Industriebezirk	48.196839	11.476602	dm-drogerie markt	48.194118	11.465640	Drugstore
2	Industriebezirk	48.196839	11.476602	Rossmann	48.193301	11.466388	Drugstore
3	Industriebezirk	48.196839	11.476602	Lidl	48.194468	11.465456	Supermarket
4	Industriebezirk	48.196839	11.476602	REWE	48.193755	11.466000	Supermarket



Analytical Approach

- Munich has a total of 25 boroughs and 107 neighborhoods
- Clustering Munich
- Only restaurant data is filtered from Foursquare venues data and utilized for this project

Methodology

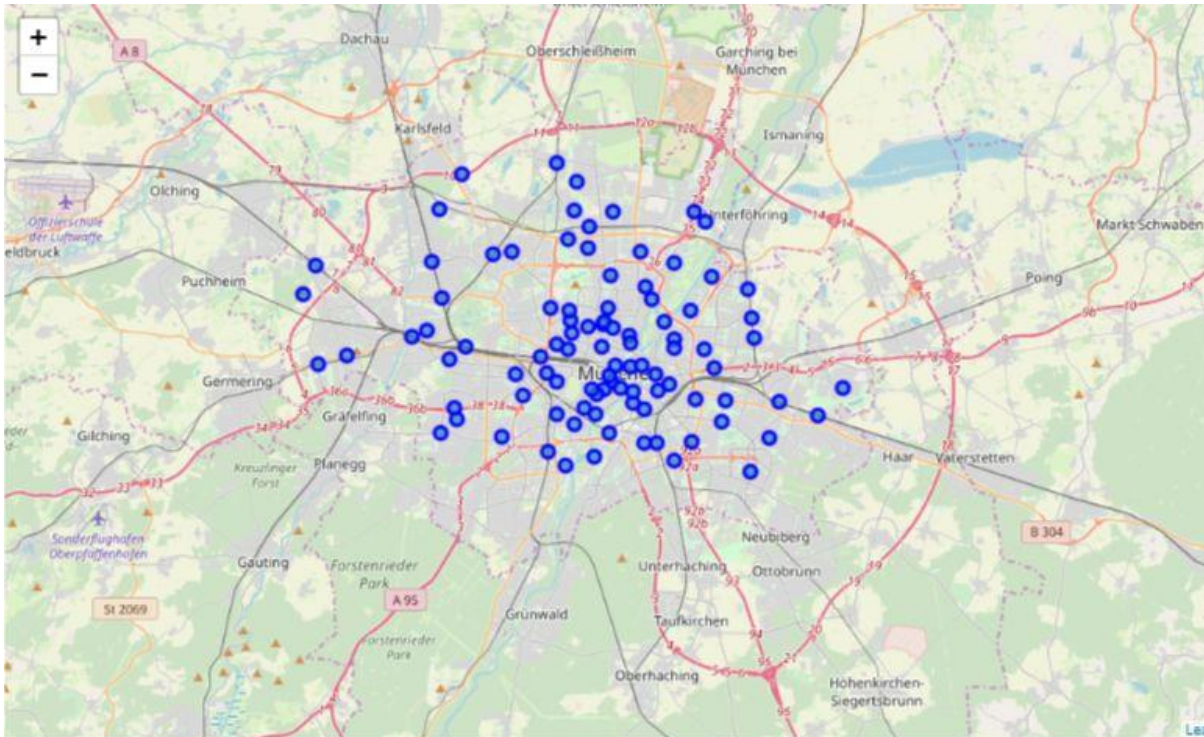
Data on the neighborhoods - 1

- Web scraping of boroughs and neighborhood data from Wikipedia using Pandas
- Load, explore, prepare and transform the data into a Pandas data frame
- The data frame contains the coordinates of the neighborhoods of Munich
- This data will be used to get Venues from the Foursquare API
- Geocoder and Folium are used to create a map of Munich with its neighborhoods superimposed on top

Methodology

Data on the neighborhoods – 2

Map of neighborhoods



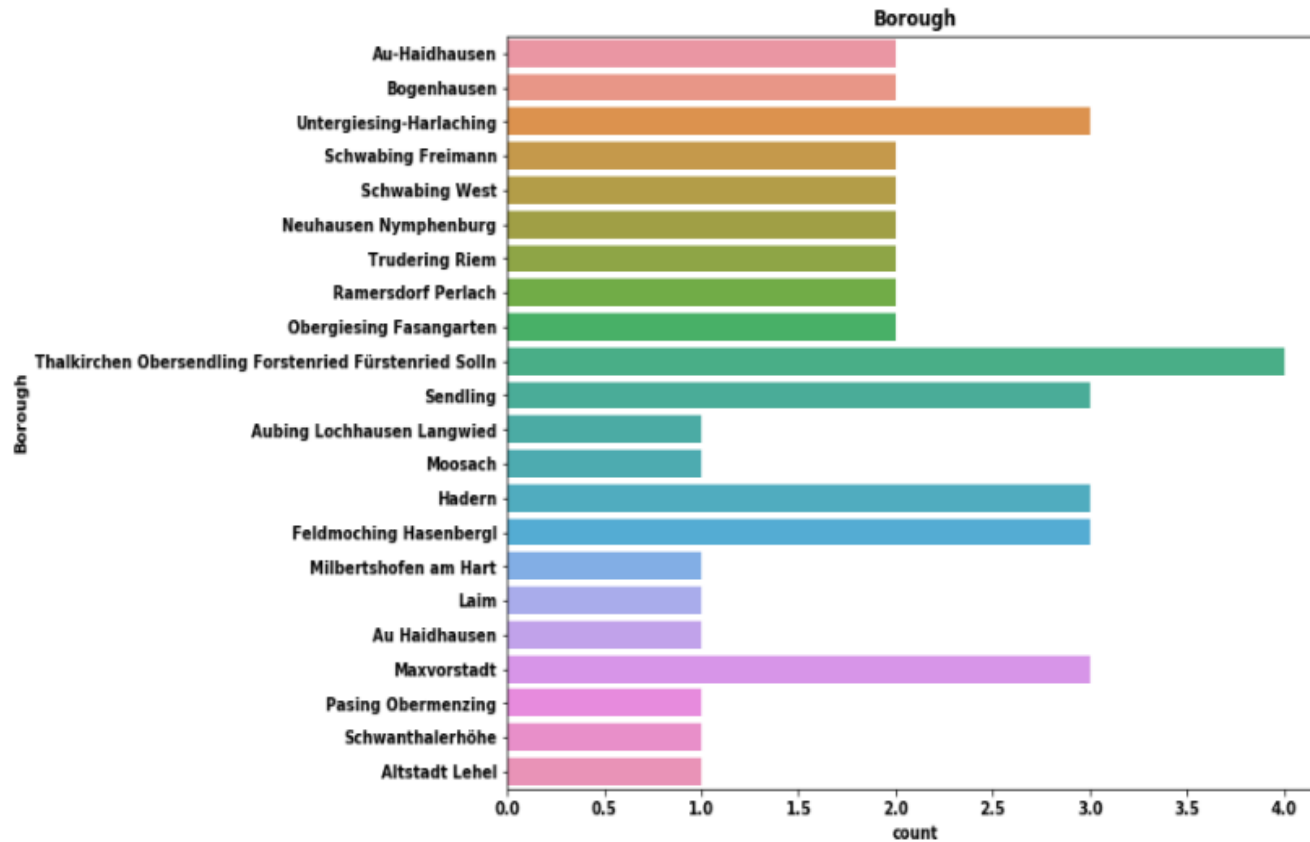
Methodology

Data on farmer's and weekly markets - 1

- Web scraping farmer's markets and weekly markets data using BeautifulSoup
- Prepare the data and transform it into a Pandas data frame
- Insert the latitude and longitude for the respective neighborhoods into the data frame
- The data frame contains the name of the market, the borough, its latitude and longitude
- Create a countplot and a map of the data

Methodology

Data on farmer's and weekly markets – 2

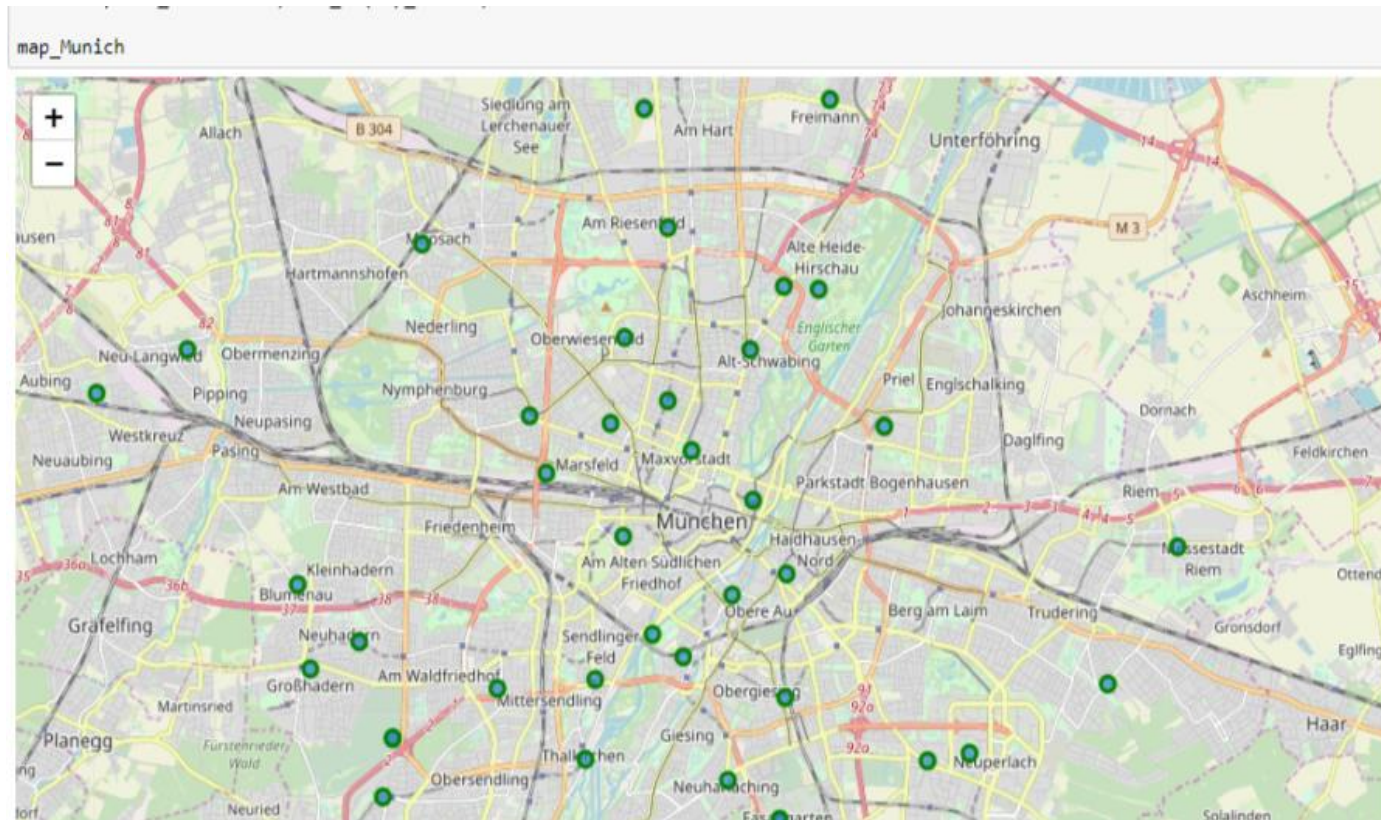


- Munich has 42 farmer's respectively weekly markets
- Thalkirchen Obersendling Forstenried Fürstenried Solln is the only borough that has four markets
- Five boroughs have three markets
- Eight boroughs have two markets
- Eight boroughs have only one market

Methodology

Data on farmer's and weekly markets – 3

Map of farmer's and weekly markets



Methodology

Data on the population and demography -1

- Scraping population and demographic data from Wikipedia using Pandas
- Load and explore the data
- Preparation of the data and transform it into a Pandas data frame

Methodology

Data on the population and demography - 2

Population

	Borough	Square-km	Population	Persons_per_square_km
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- Schwabing-West is the most highly populated borough with 15,706 people per square kilometer
- Ramersdorf-Perlach is the most populous borough with about 112,000 inhabitants
- Aubing-Lochhausen-Langwied is the largest borough with about 3,406 square kilometers

Methodology

Data on the population and demography - 3

Demographics

	Country	2000	2005	2010	2015	2018
0	Kroatien	22.009	24.866	23.740	33.177	38.137
1	Türkei	46.329	43.309	40.860	39.204	37.876
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10	Irak	4.315	8.583	9.931	10.977	12.237

- ▶ Munich has a large number of inhabitants with foreign citizenship
- ▶ One reason why Munich has such a wide range of international restaurants
- ▶ Increases the scope for operating a restaurant in Munich

Methodology

Data on venues in the neighborhoods from Foursquare - 1

- ▶ Munich geographical coordinates data are utilized as input for the Foursquare API that will be leveraged to provision venues information for each neighborhood
- ▶ Use of this API to explore neighborhoods of Munich
- ▶ Using the coordinates data from each neighborhood to get top 200 venues in a radius of 1000 meters

Methodology

Data on venues in the neighborhoods from Foursquare - 2

Venues data

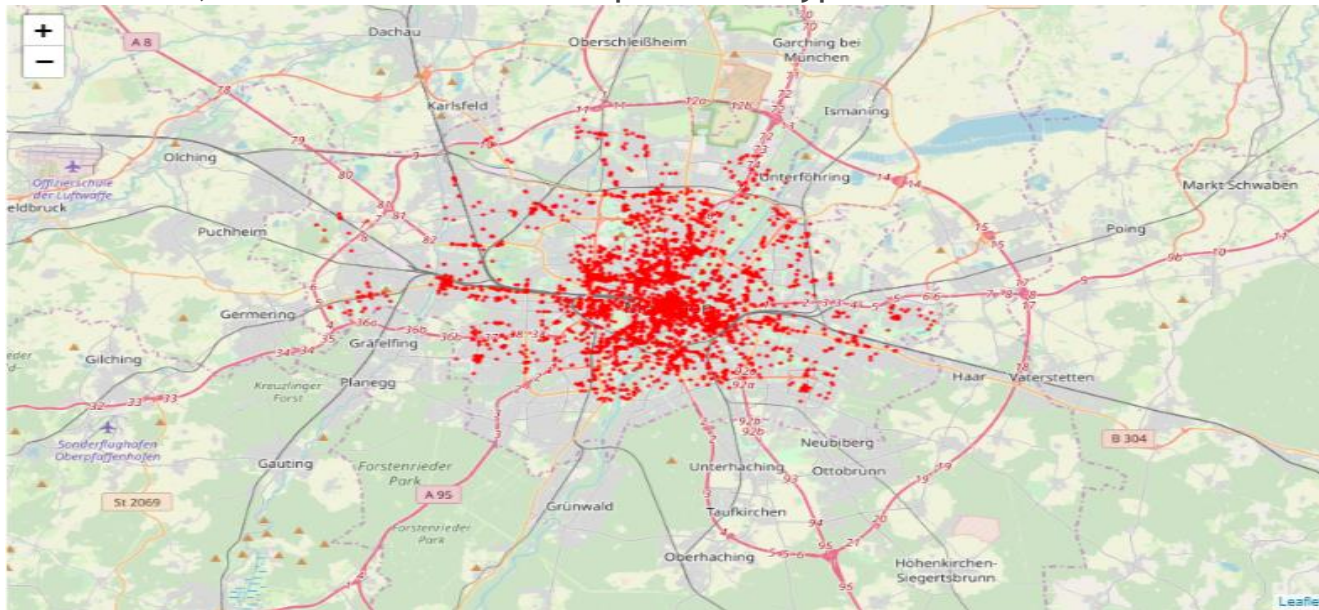
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Methodology

Data on venues in the neighborhoods from Foursquare - 3

Map of Venues

There are 5,923 venues and 296 unique venue types in Munich



Results

Segmenting and Clustering Neighborhoods - 1

Cluster0:

In this cluster the number of restaurants is very high. It shows that the market is saturated.

Cluster1:

In this cluster the number of restaurants is relatively low. It shows that the market is not saturated.

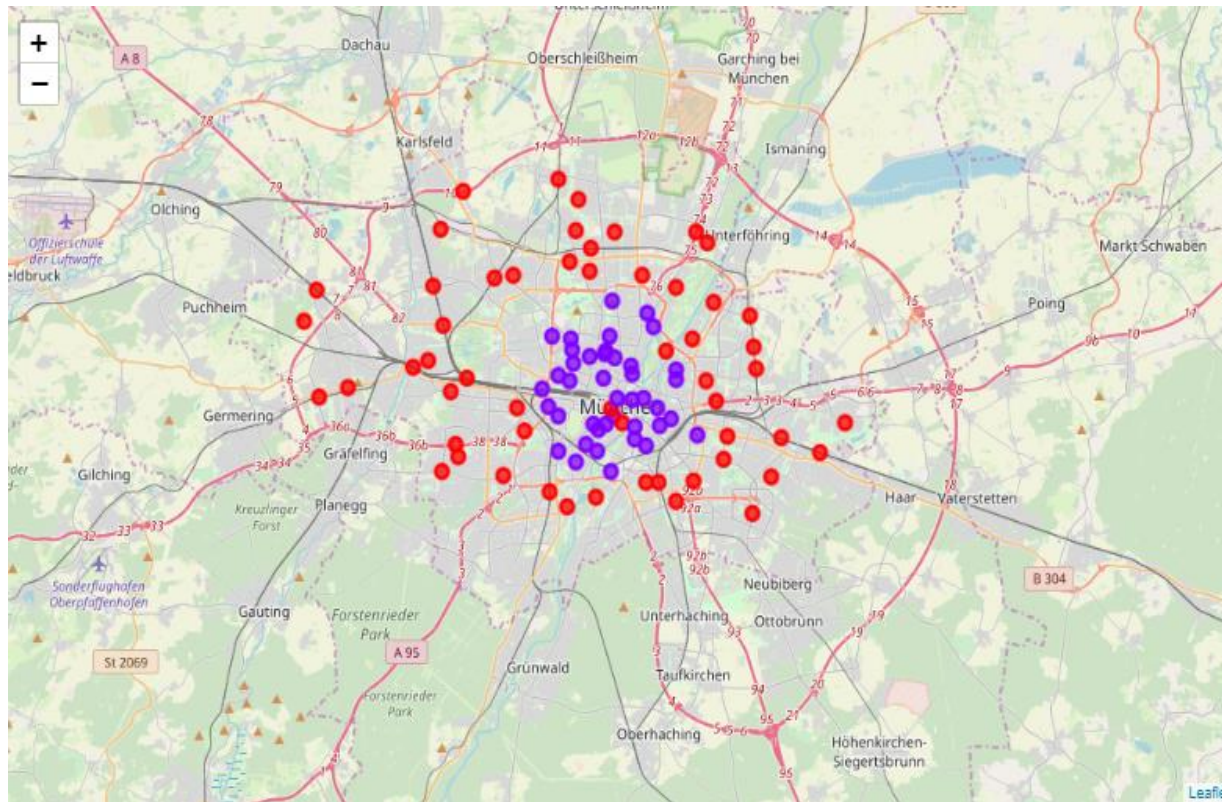
Cluster1-Neighborhoods

	Neighborhood	Latitude	Longitude	Total	Cluster_Labels
0	Altaubing	48.165736	11.401493	1	0
1	Lochhausen	48.176021	11.408845	1	0
2	St Ulrich	47.995819	11.487573	1	0
3	Alte Heide Hirschau	48.177105	11.606023	1	0
4	Obersendling	48.978020	11.520807	1	0

Results

Segmenting and Clustering Neighborhoods – 2

Cluster-Map



Discussion

Scope

- to explore farmers' markets and weekly markets in the neighborhoods

Scope

- to explore cuisines of various countries in the neighborhoods and boroughs

Scope

- to explore certain neighborhoods in more detail

Conclusion

- Analysis is based on restricted data
- Re-run analysis with better information
- Center of Munich is very competitive
- Advisable to concentrate on the regions more outside of Munich
- Obersendling is the most interesting neighborhood in this field