

## Introduction/Business Problem

Best location for a burger pub in Munich

How to find the best location for start and open a burger pub in Munich ?

This is the question that a client, Karl, asked me and that I decided to answer in this project. This kind of problem is very interesting because the approach and the techniques used to solve this one could be used also for solving other types of business problems as: the best location for opening a restaurant, a shop, etc...

Potentially all people who want to start a business where the location is important could be interested to this kind of approach and solution.

In particular Karl is interested to find the best place where to place the burger pub and due to the high diversity and large size of Munich asked me to help him.

Munich has 33 different locations and thanks to Foursquare we will find what is the best location where to place the burger according to some parameters. So we will find the locations where the number of burger pub are less and the number of potentially clients are more (presence of schools, universities, offices...)

## Data

In order to help Karl to find the best location where to start the burger business, we need to retrieve the relevant, for our purposes, data about the city of Munich and in particular about the locations (districts) of this beautiful and big city.

To do that we used Wikipedia, Open Street map API's and Foursquare.

**Wikipedia** at [https://it.wikipedia.org/wiki/Monaco\\_di\\_Baviera](https://it.wikipedia.org/wiki/Monaco_di_Baviera) to know the number and the names of all locations in Munich. (The picture shows the first 5 of 33 locations).

Location	
0	Altstadt-Lehel
1	Lehel
2	Englischer Garten
3	Ludwigsvorstadt-Isarvorstadt
4	Deutsches Museum

Coordinates(latitude, longitude) of those locations using **Open Street Map API's**.

	Location	Latitude	Longitude
0	Altstadt-Lehel	48.137828	11.574582
1	Lehel	48.138712	11.588795
2	Englischer Garten	48.165110	11.606611
3	Ludwigsvorstadt-Isarvorstadt	48.131771	11.555809
4	Deutsches Museum	48.130039	11.582888

**Foursquare** API's to find the venues data for each location:

- the burger shop venues;
- the schools venues;
- the universities venues;
- the offices venues.

At this point we know all the locations in Munich and also how many burgers, schools, universities and offices are present in each location. According with the weight given to the chosen parameters(burgers, schools, universities, offices) we will be able to find the best location where Karl could start his new business.

## Methodology

The first step of the methodology used to perform the task, consisted in retrieving and collecting all venues data of our prefixed parameters(burgers, schools, universities, offices), using **Foursquare** API's.

Then for each location computing the sum of the burgers shop, schools, universities and offices.

At this point has been assigned a weight for each category parameter:

- **burger shop** - weight **-1**, due to the fact that we want minimize the concurrence with other similar shops in the same place.
- **Schools** - weight **1**, because the student are good customers.
- **Universities** - weight **1.5**, since university students good customers.
- **Offices** - weight **2**, since employees are even better customers.

Is important to point the fact that the weights could be modified according to the importance of each category or the relevance that we would like to assign to a particular parameter.

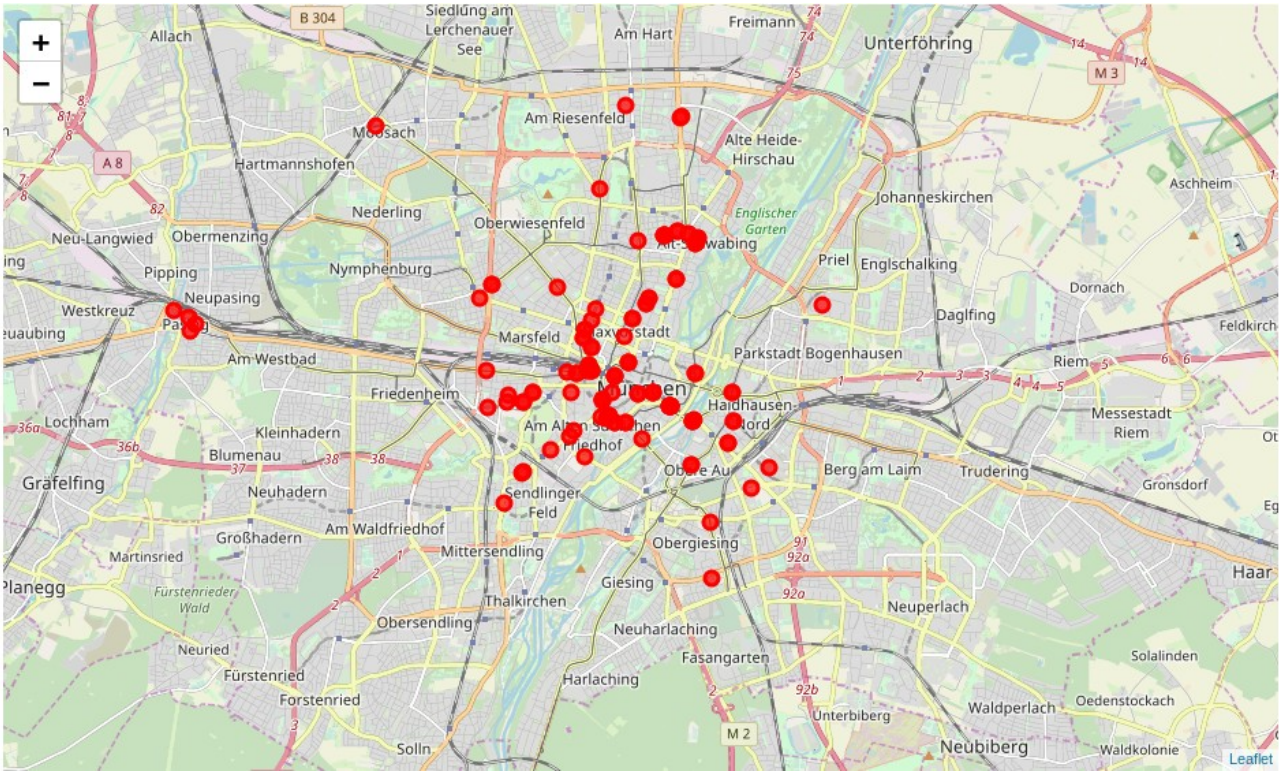
The last step has been to compute the sum of the number of venues in each of the 4 categories for each location, considering the weight previously defined.

This recommendation system maximize the importance of our given parameter in which is penalized the presence of other similar business and empathize the presence of young people and large number of potentially customers(offices-employees).

### Burger locations (first 5 results)

	Location	Location Latitude	Location Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Altstadt-Lehel	48.137828	11.574582	Ruff's Burger	48.136013	11.574291	Burger Joint
1	Altstadt-Lehel	48.137828	11.574582	Ruff's Burger	48.132415	11.567127	Burger Joint
2	Altstadt-Lehel	48.137828	11.574582	Der Kleine Flo	48.136377	11.568075	Burger Joint
3	Altstadt-Lehel	48.137828	11.574582	Ruff's Burger	48.139869	11.562782	Burger Joint
4	Altstadt-Lehel	48.137828	11.574582	Loco Monaco	48.145658	11.570919	Food Truck

Buger map

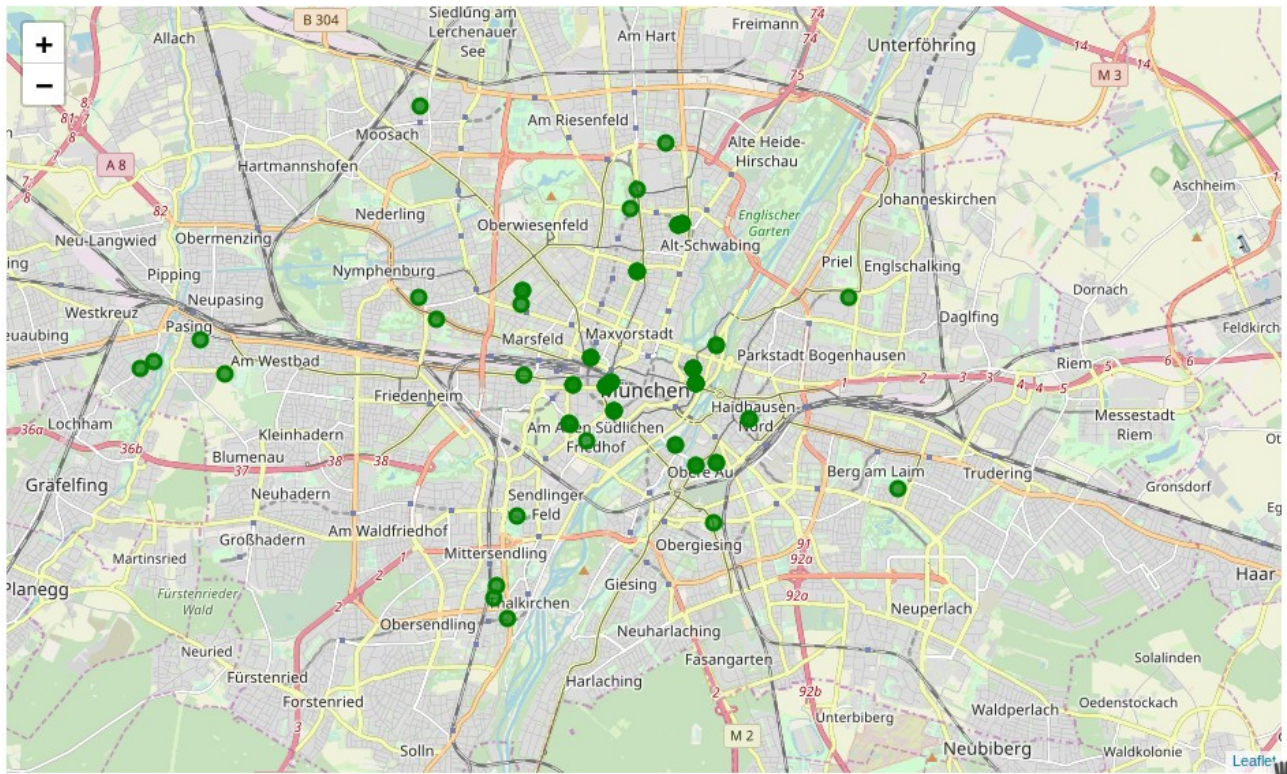


School(first 10 results) locations

	Location	Location Latitude	Location Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Altstadt-Lehel	48.137828	11.574582	JIZ München	48.138301	11.566910	Building
1	Altstadt-Lehel	48.137828	11.574582	Städtisches Luisengymnasium	48.142547	11.561738	High School
2	Altstadt-Lehel	48.137828	11.574582	Städtisches St.-Anna-Gymnasium	48.140724	11.587326	High School
3	Altstadt-Lehel	48.137828	11.574582	Staatliche Fachoberschule und Berufshochschule...	48.133640	11.567403	High School
4	Altstadt-Lehel	48.137828	11.574582	Φροντιστήριο Γνώση	48.137760	11.565420	High School
5	Altstadt-Lehel	48.137828	11.574582	Wilhelmsgymnasium	48.138132	11.588254	High School
6	Lehel	48.138712	11.588795	Städtisches St.-Anna-Gymnasium	48.140724	11.587326	High School
7	Lehel	48.138712	11.588795	Wilhelmsgymnasium	48.138132	11.588254	High School
8	Lehel	48.138712	11.588795	Luitpold-Gymnasium	48.144447	11.593316	High School
9	Ludwigsvorstadt-Isarvorstadt	48.131771	11.555809	Theresiengymnasium	48.131501	11.556205	High School



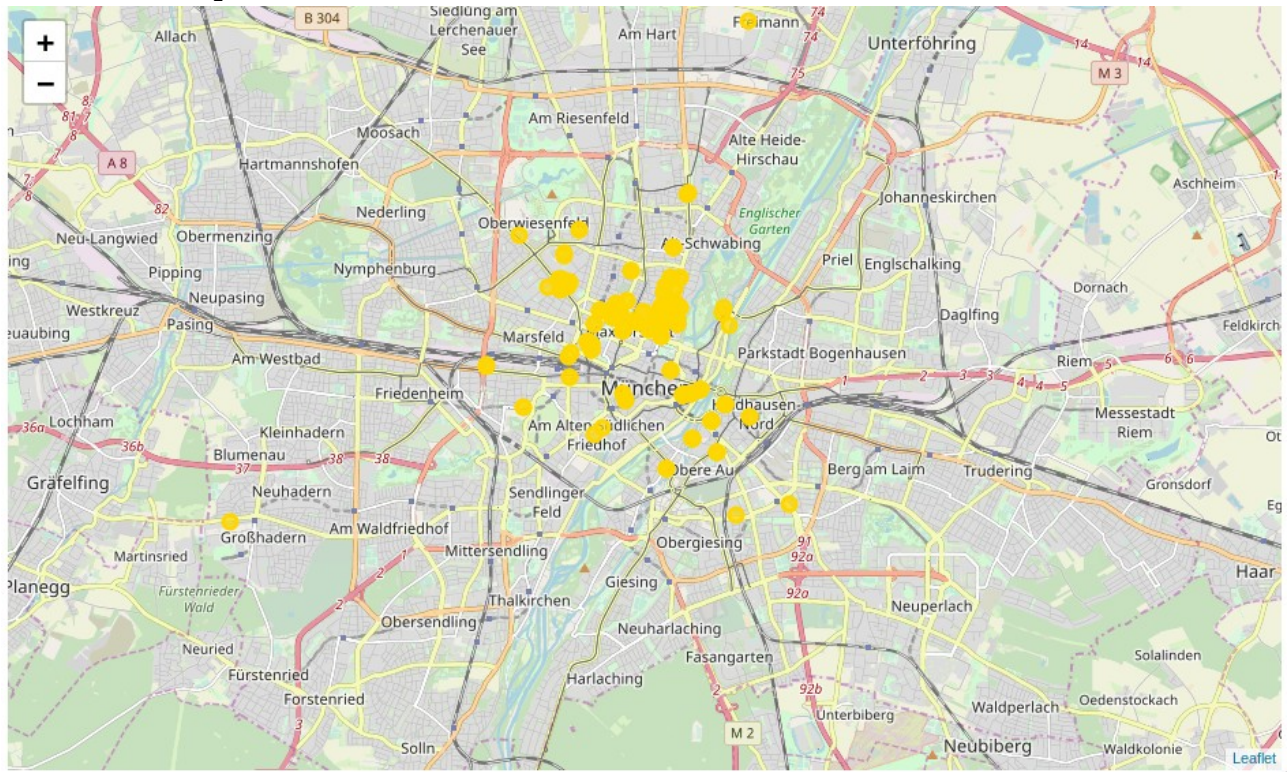
Schools map



University(first 5 results) locations

	Location	Location Latitude	Location Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Altstadt-Lehel	48.137828	11.574582	BWS Germanlingua	48.136114	11.569479	School
1	Altstadt-Lehel	48.137828	11.574582	Universität Bayern	48.135791	11.584822	University
2	Altstadt-Lehel	48.137828	11.574582	International School of Management	48.143411	11.561843	University
3	Altstadt-Lehel	48.137828	11.574582	Hochschule für Politik	48.145613	11.579330	University
4	Altstadt-Lehel	48.137828	11.574582	IBZ	48.148479	11.578199	University

Universities map

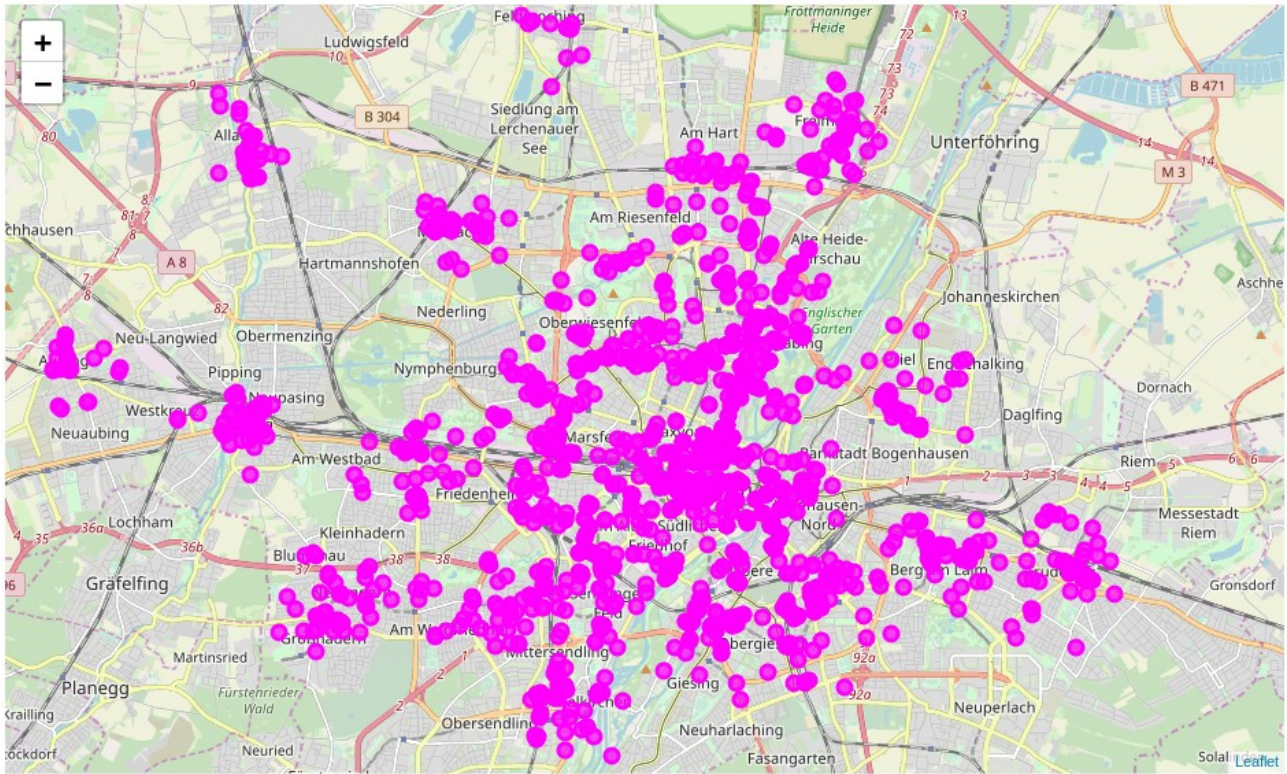


Office(first 5 results) locations

	Location	Location Latitude	Location Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Altstadt-Lehel	48.137828	11.574582	Dom zu Unserer Lieben Frau (Frauenkirche)	48.138467	11.573273	Church
1	Altstadt-Lehel	48.137828	11.574582	Mariensäule	48.137205	11.575641	Monument / Landmark
2	Altstadt-Lehel	48.137828	11.574582	Neues Rathaus	48.137226	11.575403	City Hall
3	Altstadt-Lehel	48.137828	11.574582	St. Peter	48.136530	11.575615	Church
4	Altstadt-Lehel	48.137828	11.574582	Glockenspiel	48.137225	11.575357	Monument / Landmark



Offices map



## Results

In the next figure are reported the total number of our chosen parameters for each locations.

	Location	Latitude	Longitude	Burger	High Schools	Universities	Offices
0	Altstadt-Lehel	48.137828	11.574582	18.0	6.0	18.0	50.0
1	Lehel	48.138712	11.588795	7.0	3.0	12.0	50.0
2	Englischer Garten	48.165110	11.606611	0.0	0.0	0.0	47.0
3	Ludwigsvorstadt-Isarvorstadt	48.131771	11.555809	14.0	6.0	5.0	50.0
4	Deutsches Museum	48.130039	11.582888	8.0	6.0	9.0	50.0
5	Maxvorstadt	48.146570	11.571445	12.0	4.0	48.0	50.0
6	Königsplatz	48.146316	11.565630	11.0	4.0	37.0	50.0
7	Schwabing-West	48.164417	11.570364	2.0	5.0	4.0	50.0
8	Au-Haidhausen	48.128753	11.590536	6.0	5.0	9.0	49.0
9	Maximilianeum	48.136134	11.595202	7.0	4.0	8.0	50.0
10	Sendling	48.118012	11.539083	3.0	1.0	0.0	48.0
11	Sendling-Westpark	48.118031	11.519333	0.0	0.0	0.0	46.0
12	Schwanthalerhöhe	48.134230	11.539034	6.0	1.0	3.0	50.0
13	Neuhausen-Nymphenburg	48.154222	11.531517	2.0	4.0	0.0	50.0
14	Oberwiesenfeld	48.164800	11.547168	2.0	1.0	10.0	50.0
15	Moosach	48.179895	11.510571	1.0	1.0	0.0	36.0
16	Milbertshofen-Am Hart	48.182385	11.575043	3.0	1.0	0.0	50.0
17	Schwabing-Freimann	48.156295	11.588142	9.0	3.0	33.0	50.0
18	Freimann	48.198426	11.605675	0.0	0.0	1.0	48.0
19	Münchner Freiheit	48.163182	11.587033	9.0	2.0	6.0	49.0
20	Bogenhausen	48.154782	11.633484	1.0	1.0	0.0	43.0
21	Berg am Laim	48.123483	11.633451	0.0	1.0	0.0	46.0
22	Trudering-Riem	48.123175	11.664078	0.0	0.0	0.0	43.0
23	Ramersdorf-Perlach	48.114710	11.613231	2.0	0.0	1.0	48.0
24	Obergiesing-Fasangarten	48.111156	11.588909	2.0	1.0	1.0	48.0
25	Untergiesing-Harlaching	48.114963	11.570189	0.0	0.0	1.0	48.0
26	Thalkirchen-Obersendling-Forstenried-Fürstenri...	48.101321	11.546167	0.0	3.0	0.0	46.0
27	Hadern	48.118064	11.481842	0.0	0.0	1.0	44.0
28	Pasing-Obermenzing	48.147785	11.460701	4.0	4.0	0.0	43.0
29	Aubing-Lochhausen-Langwied	48.158437	11.414066	0.0	0.0	0.0	24.0
30	Allach-Untermenzing	48.195994	11.457013	0.0	0.0	0.0	25.0
31	Feldmoching-Hasenberg	48.215943	11.533323	0.0	0.0	0.0	10.0
32	Laim	48.139551	11.502166	0.0	0.0	0.0	41.0

At this point applying the weights assigned to each category we have the follow score:

	<b>Location</b>	<b>Score</b>
5	Maxvorstadt	164.0
6	Königsplatz	148.5
17	Schwabing-Freimann	143.5
0	Altstadt-Lehel	115.0
14	Oberwiesenfeld	114.0
1	Lehel	114.0
4	Deutsches Museum	111.5
8	Au-Haidhausen	110.5
7	Schwabing-West	109.0
9	Maximilianeum	109.0
13	Neuhausen-Nymphenburg	102.0
19	Münchner Freiheit	100.0
3	Ludwigsvorstadt-Isarvorstadt	99.5
12	Schwanthalerhöhe	99.5
16	Milbertshofen-Am Hart	98.0
18	Freimann	97.5
25	Untergiesing-Harlaching	97.5
24	Obergiesing-Fasangarten	96.5
23	Ramersdorf-Perlach	95.5
26	Thalkirchen-Obersendling-Forstenried-Fürstenri...	95.0
10	Sendling	94.0
2	Englischer Garten	94.0
21	Berg am Laim	93.0
11	Sendling-Westpark	92.0
27	Hadern	89.5
28	Pasing-Obermenzing	86.0
20	Bogenhausen	86.0
22	Trudering-Riem	86.0
32	Laim	82.0
15	Moosach	72.0
30	Allach-Untermenzing	50.0
29	Aubing-Lochhausen-Langwied	48.0
31	Feldmoching-Hasenberg	20.0

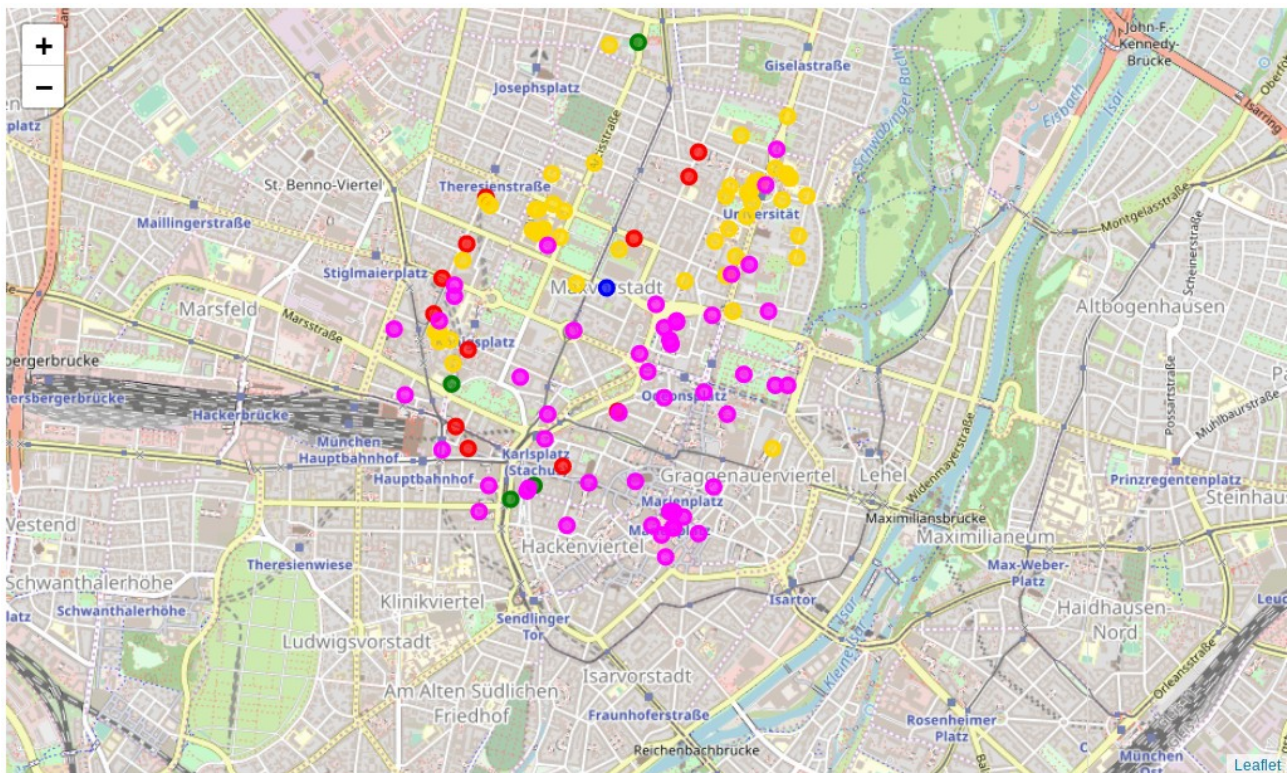


Is easy to see that the best location for start a new burger shop business in Munich, according with the weight assigned to the chosen parameters:

- **burger** = -1
- **schools** = 1
- **universities** = 1.5
- **offices** = 2

is **Maxvorstadt**. This option maximize the number of potential customers from offices and universities and at same time minimize the concurrence of other similar business.

## Map of the winner location



## Recommendations

This project analysis could be improved with some extensions:

- Considering more categories. For example the presence of Hospitals, Stadium or other type of building where “there are” a lot people that are working there.
- Collect and analyze other type of data like per capita income and know where there are people that are more similar to our ideal target
- using temporal reference referred to the business performance of the same kind of business shop in order to realize a regression model and find if, when and where could be interesting start that business.

## **Conclusion**

In this study case, I have had the possibility to face up with a real problem and take advantage of my acquired skills to solve and perform a real deep analysis.

The schema used for approaching this problem could be used as a base for exploring other type of “problems” as for example: where is more convenient invest or buy an house.