

# Zurich: To Jazz or Not to Jazz

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## 1 Introduction

The cultural scene in Zurich, Switzerland is very active. Not only is the city home to famous institutions such as the Opera House or the Kunsthaus, but it is also the birthplace of the Dada movement [1]. There are many cultural events organised in the area which makes Zurich a very vibrant city.

However, the number of jazz bars is surprisingly low in the city compared to the number of music venues of other genres, and there might be a business opportunity to seize if one is interested in opening a bar that is somewhat different from the other bars. In addition to being a different concept, a jazz bar can be a great place for promoting young talented musicians by giving them a location where they can produce their jazz gigs, and this can prove popular among the locals. The aim of this project is thus to find potential areas in Zurich that would be ideal for a opening a jazz bar.

For this, several criteria will be taken into account.

- (a) First of all, we will look for areas in Zurich that are **nice to hang out in**. Areas that contain other bars, restaurants etc. will be good candidate areas.
- (b) We will, however, not want to look at areas that are already overcrowded with bars in order to **avoid fierce competition**. In addition, we will look for other jazz bars in the region and avoid being near them.
- (c) We will also try to be not too far from the **Zurich University of the Arts** (Zürcher Hochschule der Künste or ZHdK), where jazz musicians are educated and formed. This will make it easier for them to come and play in our jazz bar.
- (d) Last but not least, we will try to find areas where the rent is **not too expensive**.

The districts (or neighbourhood depending on the translation) in Zurich are numbered and called **Kreise** (e.g., Kreis 4) and there are 12 Kreise in Zurich. We will further segment the districts into circular areas with a radius of **800 metres** so that we can look at smaller candidate areas.

## 2 Data

The data of the mean rent can be found on the [Zurich city webpage](#), where they give the mean rent per district in Zurich city.

We will also need data on the geographical boundaries of the districts of Zurich so that we can know the mean rent of the candidate areas we are looking for. There are two possibilities for this: the data can be extracted either from

- (a) the [Swiss Confederation webpage](#) dedicated to geoinformation (or via [opendata.swiss](#)), or

(b) from **Nominatim**, which is a search engine for OpenStreetMap data.

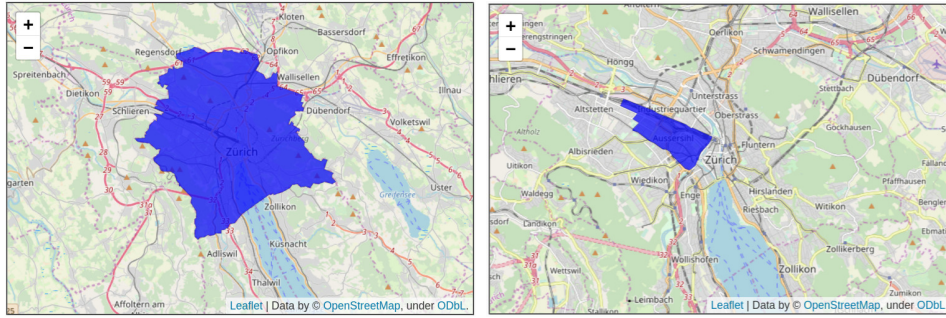
In the first case, the data is given in file formats commonly used for maps. We can convert to the **geojson** format using the command **ogr2ogr** in a console. In the second case, we can directly extract data

## 3 Methodology

### 3.1 Data acquisition and exploration

#### 3.1.1 Getting geographical data

First, we will get the (boundary) coordinates of Zurich city and its districts with Nominatim as explained above. We will use **geopy** for all geographical data treatment. Some of the data for the districts had to be found manually with the coordinates, as there were some errors in the original data.



We will now divide Zurich in small circular areas of radius 800 m. For that, we first get the minimal/maximal values of the latitude/longitude of Zurich city. We then make circular areas in a form of grid and check whether the center of each area belongs to the city or not. We also look in which district they belong to:

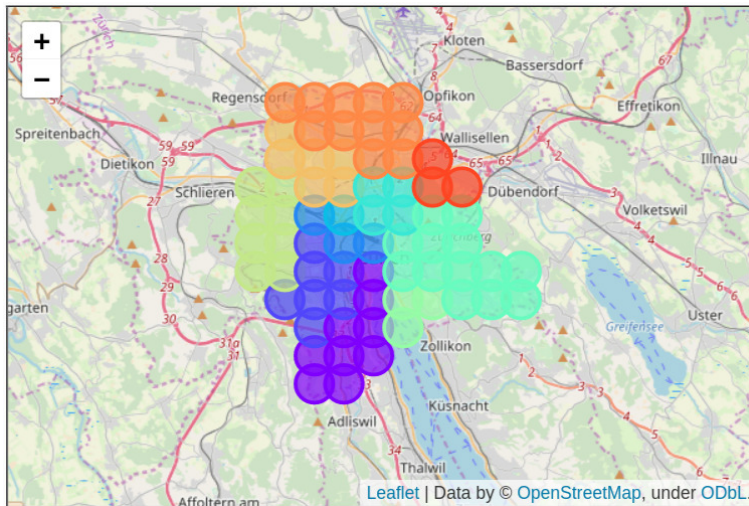


Figure 1: City of Zurich divided in circles of radius 800 m. The colours indicate the district number (1 to 12).

### 3.1.2 Obtaining the rent data

The rent data has been obtained from the Zurich city webpage as an Excel spreadsheet. The file contains the mean rent per district. For our purposes, we will just need the mean rent per square meter:

	Neighbourhood	CHF
1	1	29
2	2	22.8
3	3	23.3
4	4	23.4
5	5	24.2
6	6	23.6
7	7	23
8	8	25
9	9	21.6
10	10	22.2
11	11	21.1
12	12	20.7

The reason for that is because we just want the rank of the expensiveness:

	Neighbourhood	Expensiveness
12	12	1
11	11	2
9	9	3
10	10	4
2	2	5
7	7	6
3	3	7
4	4	8
6	6	9
5	5	10
8	8	11
1	1	12

Figure 2: Rank of expensiveness of mean rent for each district in Zurich.

We will use this information at the end, when we will start filtering the tiles.

## 3.2 Clustering using k-means

Now that we have the tiles at our disposal, we will start clustering them in different clusters by using the 10 most common venues of each tile. For this, we will use **Foursquare**. We will first get the top 100 venues of each tile. This will allow us to statistically obtain the 10 most common venues of each tile. Remember that our aim at the end of the clustering algorithm is to determine good

hang-out areas. For this, the k-means clustering algorithm will be used, which is an unsupervised learning method used to cluster data.

Let us first determine the ideal number of clusters. Using the elbow point method (where we look at the inflection point in the sum of squared error, we see that 2 or 3 clusters would be ideal:

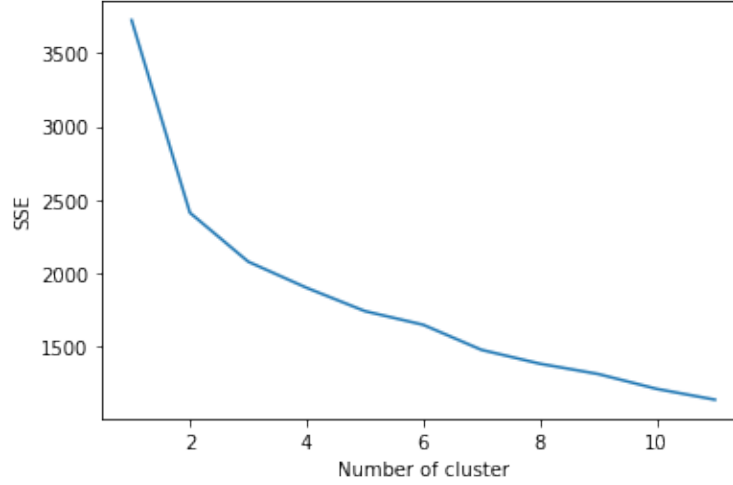


Figure 3: Sum of squared error for differnt numbers of clusters.

Here, we choose to use 3 clusters:

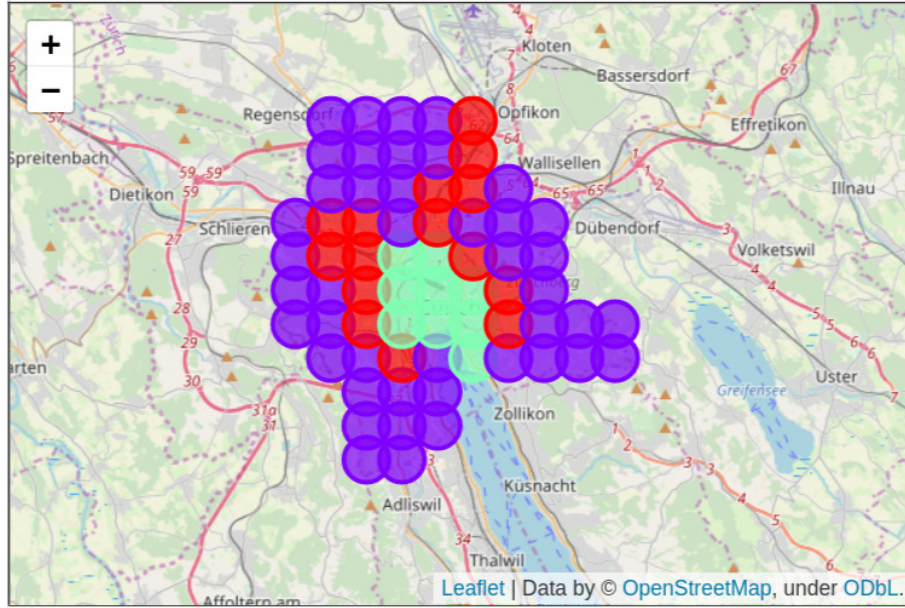


Figure 4: Areas clustered into 3 clusters (green: 1, purple: 2, red: 3).

After inspection of the venues in the clusters, we can realise that clusters 1 and 3 (green and red) are predominantly composed of bars and restaurants. The cluster 2 also contains some restaurants and bars, but it is dominated by bus stations, convenience stores, sportswear shops etc. We hence choose to keep clusters 1 and 3 from here.



### 3.3 Obtaining distance between tiles and venues

From here, we will now exclude areas that contain 5 bars or more, as the competition will be fierce. This leaves the tiles we see below:

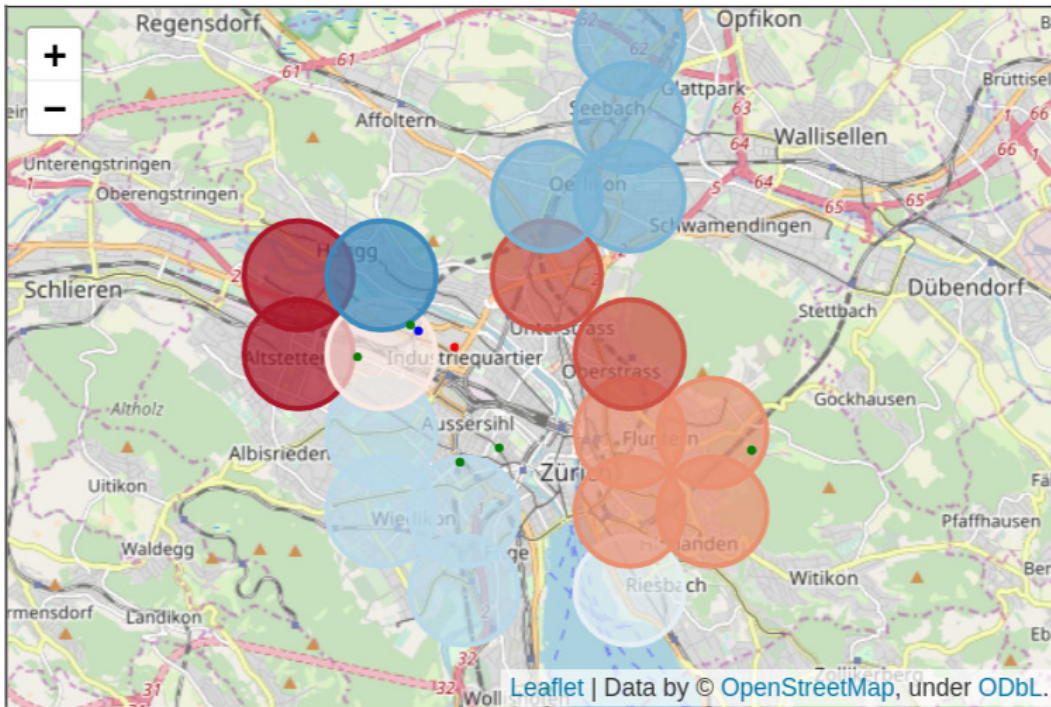


Figure 5: Hot areas containing less than 5 bars, from clusters 1 & 3. Blue is cheaper rent, red is more expensive.

On this Figure 5, the Zurich University of Arts (ZHdK) is shown with the blue dot on it. There are dots with two more colours, red and blue. They correspond to two more criteria we will consider. All in all, we will consider following points:

- (a) We want the ZHdK to be close so that music students can come easily for jazz jams and concerts at the bar. We will set a threshold of **2 km**. To obtain the distance between the tiles and the ZHdK, `geopy.distance` can be used. It uses the coordinates to calculate geodesic distances.
- (b) From the venues we collected using Foursquare, one existing jazz bar was found. Hence, we will try to be not too close from this venue.
- (c) Optionally, we gather all the music venues found with Foursquare, and attempt to find areas close to them if it is possible. As they are not bars, they are not in a direct competition with the jazz bar we are trying to open. The idea is that people might appreciate coming to our bar after concerts from these music venues, so they can be, in fact, a positive influence for us.

Taking into the first criterion—less than 2 km from the ZHdK—only 5 circular areas remain on our map:

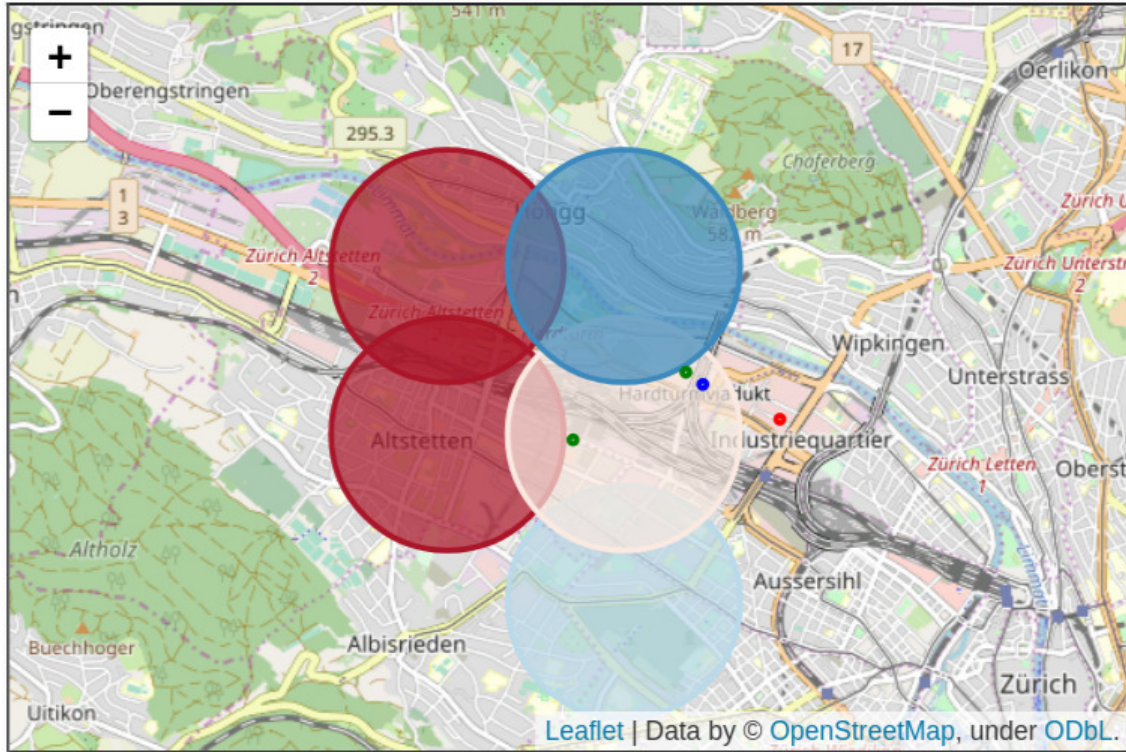


Figure 6: Hot areas that are close to the Zurich University of Arts, with less than 5 bars per area. Blue is cheaper rent, red is more expensive.

We see that the existing jazz bar we wanted is not in one of our candidate areas anymore. In addition, two of the music venues are still within our candidate areas. The two latter criteria are thus automatically satisfied.

### 3.4 Mean rent per district

The last aspect to consider is the rent of the jazz bar we wish to open. We would obviously like to have the lowest rent possible. For that, we use the data we gathered in 3.1.2. Eliminating the areas that we deem too expensive, we finally get the three areas we will see in the next section.



## 4 Results

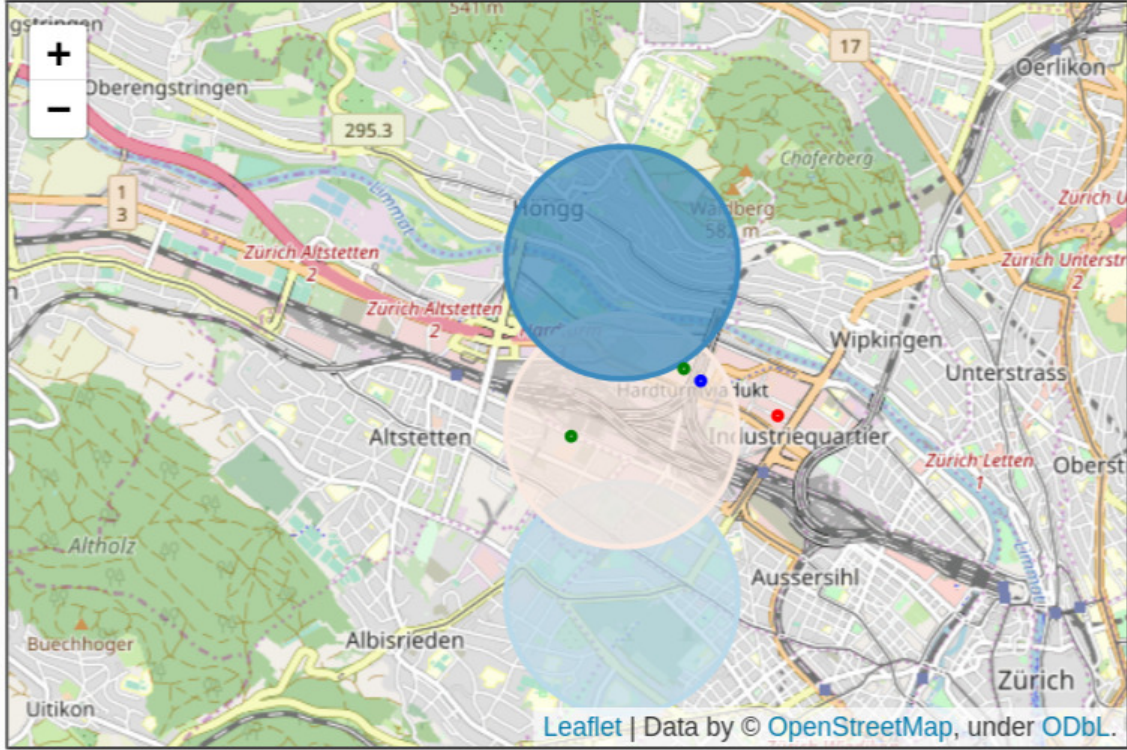


Figure 7: Candidate areas for our new jazz bar. The blue colour indicates a relative cheapness of the rent, and the red colour the expensiveness.

Our final candidate areas, from down to up, are as follows:

- (a) Albisriederstrasse, Sihlfeld, Wiedikon, Zurich, 8003 Switzerland (47.377443, 8.504463)
- (b) Hohlstrasse, Hard, Aussersihl, Zurich, 8048 Switzerland (47.387847, 8.504463)
- (c) Ackersteinstrasse, Hönegg, Zurich, 8049 Switzerland (47.398252, 8.504463)

The addresses as well as the coordinates are given here. The blue colour indicates a relative cheapness of the rent, and the red colour the expensiveness of the rent of the area.

## 5 Discussion

The area (a) is interesting as it is relatively cheap and it is the closest area to the main train station which is near the lake. The area (b) is the most expensive of our three candidates, but it is very near to one of the big train stations in Zurich (Hardbrücke railway station) and it is very close to the ZHdK. Indeed, from my knowledge of the city, it is a popular area where young people hang out a lot. Despite this fact, an industrial zone is near, which means that the rent is relatively inexpensive for a hype area. The area (c) is the cheapest area, and is close to Hönngerberg, where one of the campuses of ETH Zurich (Swiss Federal Institute of Technology in Zurich) is located. It is also to be noted that there are also two music venues that are close to our candidate areas.

All in all, these three areas are all well suited for a new jazz bar. Depending on different business perspectives or personal taste, one can choose either of these three areas.

## 6 Conclusion

We have tried to spot the ideal places for a new jazz bar in Zurich. Considering the proximity to the Zurich University of Arts, the cost of the rent, the competition with other bars and the popularity of the areas, we managed to find three potential areas in Zurich that would be well-suited for a new jazz bar. Note that other variables such as the easiness of access by public transportation could be further considered in our analysis to broaden our analysis and make a better decision. There might also be some interesting statistical considerations to make in the choice of an area.

## 7 Bibliography

### References

- [1] Stadt Zürich. zuerich.com. URL: <https://www.zuerich.com/en/visit/dada> (visited on 01/10/2020) (cit. on p. 1).