THE BATTLE OF NEIGHBORHOODS

A new Pizzeria in Basel

INTRODUCTION

As Italian abroad, a potential customer would like to open a traditional Italian pizzeria in Switzerland, more specifically in Basel. Some of the concern of the customers are:

- How many restaurants are already in Basel
- How many of them already offer ethical food
- How many Pizzeria are there in Basel and surrounding
- What is the best area where to open eventually
- What could be the expected income of his Pizzeria

INTRODUCTION
Few facts about Basel

Basel is a city in north-western Switzerland on the river Rhine. Basel is Switzerland's third-most-populous city (after Zürich and Geneva) with about 180,000 inhabitants.

- Basel is a rich middle-sized city in north Switzerland
- It is Multicultural
- Provides a lot of business opportunities
- Attracts thousand of visitors every year

PROJECT – HIGH LEVEL

The idea of the project is the creation of a model capable to predict the success of a new Restaurant in a city similar to Basel (midsize European city).

A high-level approach could be:

- The customer decides what kind of restaurant wants to open and what is the target city
- A website like Tripadvisor scrapped for the restaurant list in the selected city
- Each restaurant is enriched with geographical data
- The historical crime within a predetermined distance of all venues are obtained
- A map is presented showing restaurant and crime statistics of the area
- Areas are also evaluated in term of prestige and number of inhabitants

The main data science aspect of this project including:

- Data Acquisition and Data Cleansing
- Data Analysis

DATA

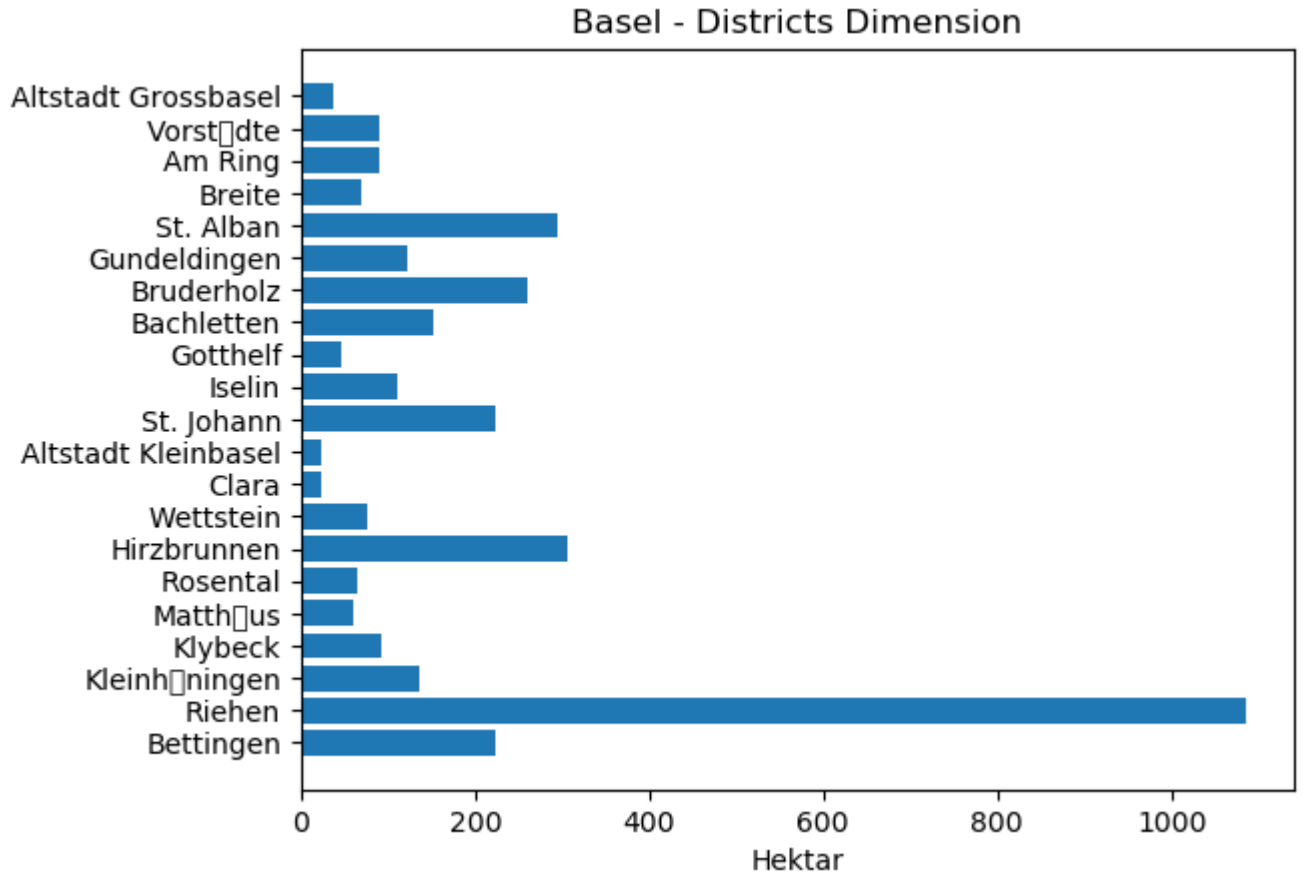
- The principal source of data are the official statistics provided by Basel-Land website: https://www.statistik.bs.ch/zahlen/tabellen/1-bevoelkerung/bestand-struktur.html

From this website will be possible to extract and scramble:

- Name and area of the various districts
- Population data (Local and immigrants)
- Social Welfare quota & Net worth distribution

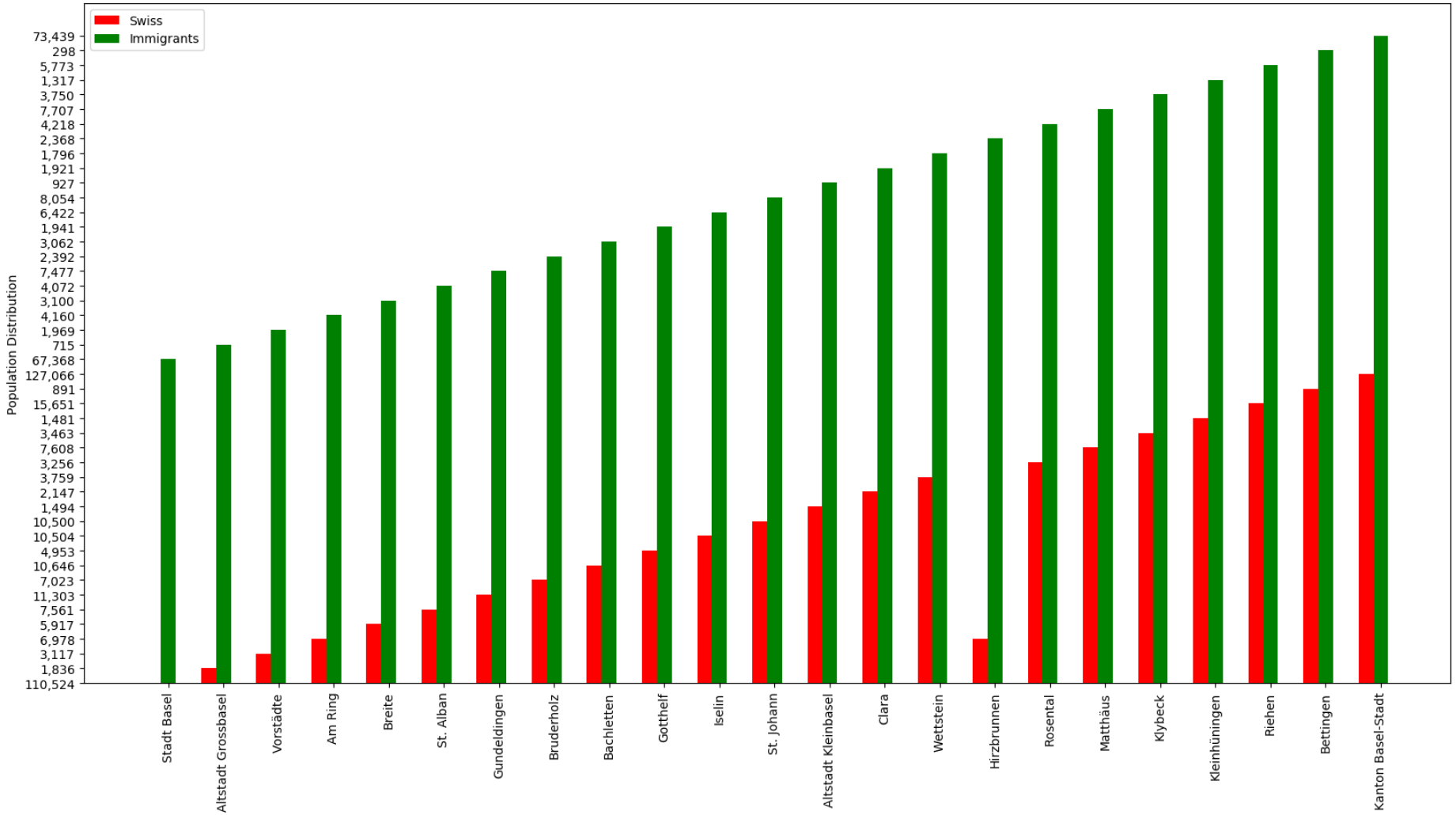
DATA VISUALIZATION

Name and area of the various districts



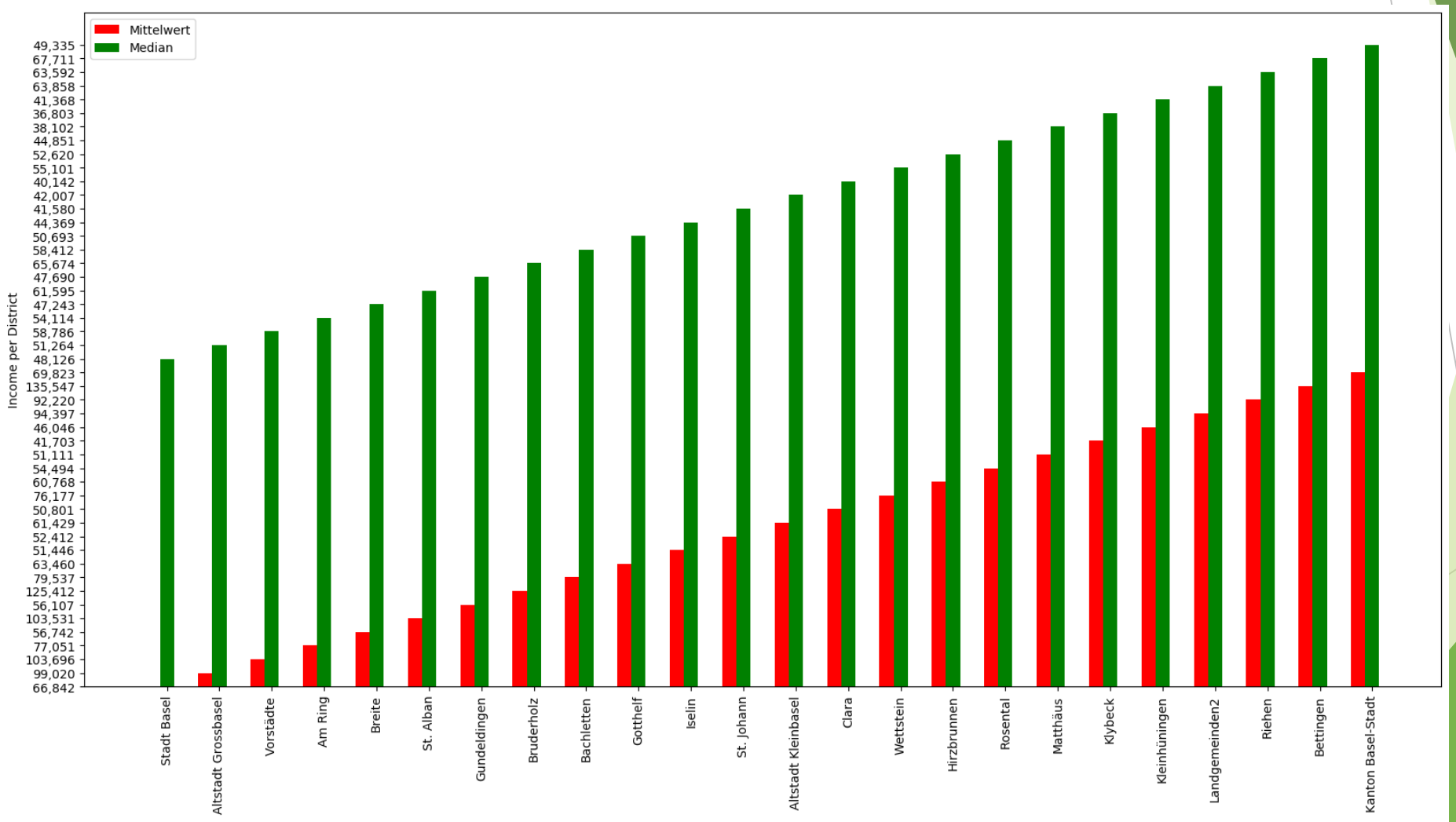
DATA VISUALIZATION

Population data (Local and immigrants)



DATA VISUALIZATION

Social Welfare quota & Net worth distribution



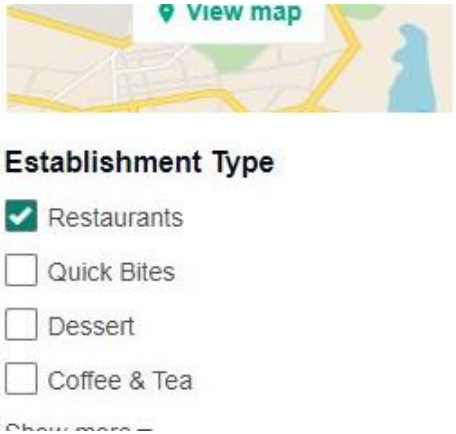
ANALYTIC APPROACH

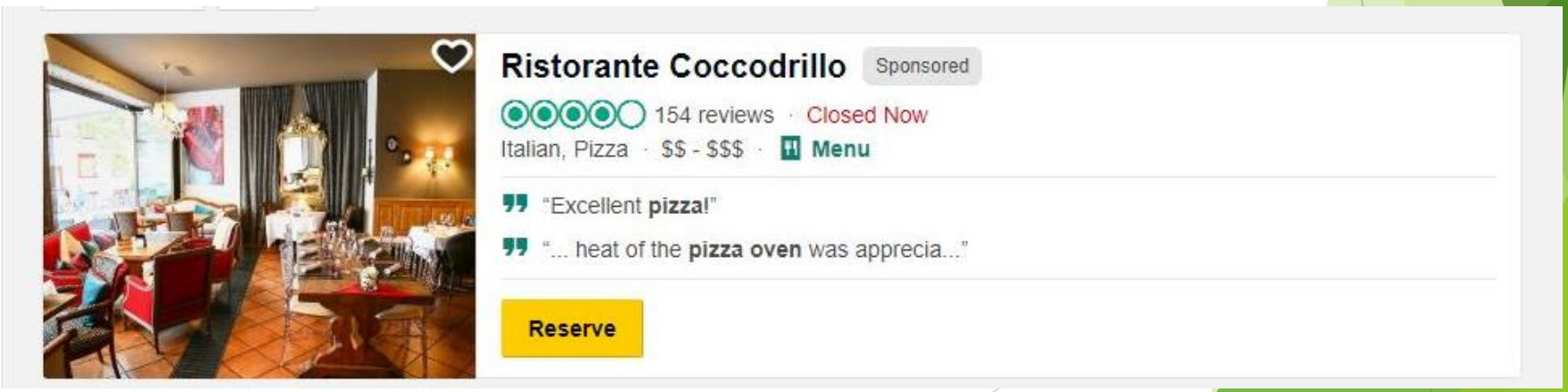
Basel is a medium-small city with less than 200,000.00 citizens and 24 neighbourhoods.

The first step is to better understand the composition of Basel neighbourhoods, clustering the various quarters in an exploratory Data Analysis.

We will also scramble data from Tripadvisor, in order to understand actual Pizzerias distribution and average ranking and price evaluation.

https://www.tripadvisor.com/Restaurants-g188049-Basel.html





METHODOLOGY

- The first step is to link neighbourhoods with their Latitude and Longitude. To do so we take advantage of **geopy library**: *!pip install geopy*.

Out[6]:

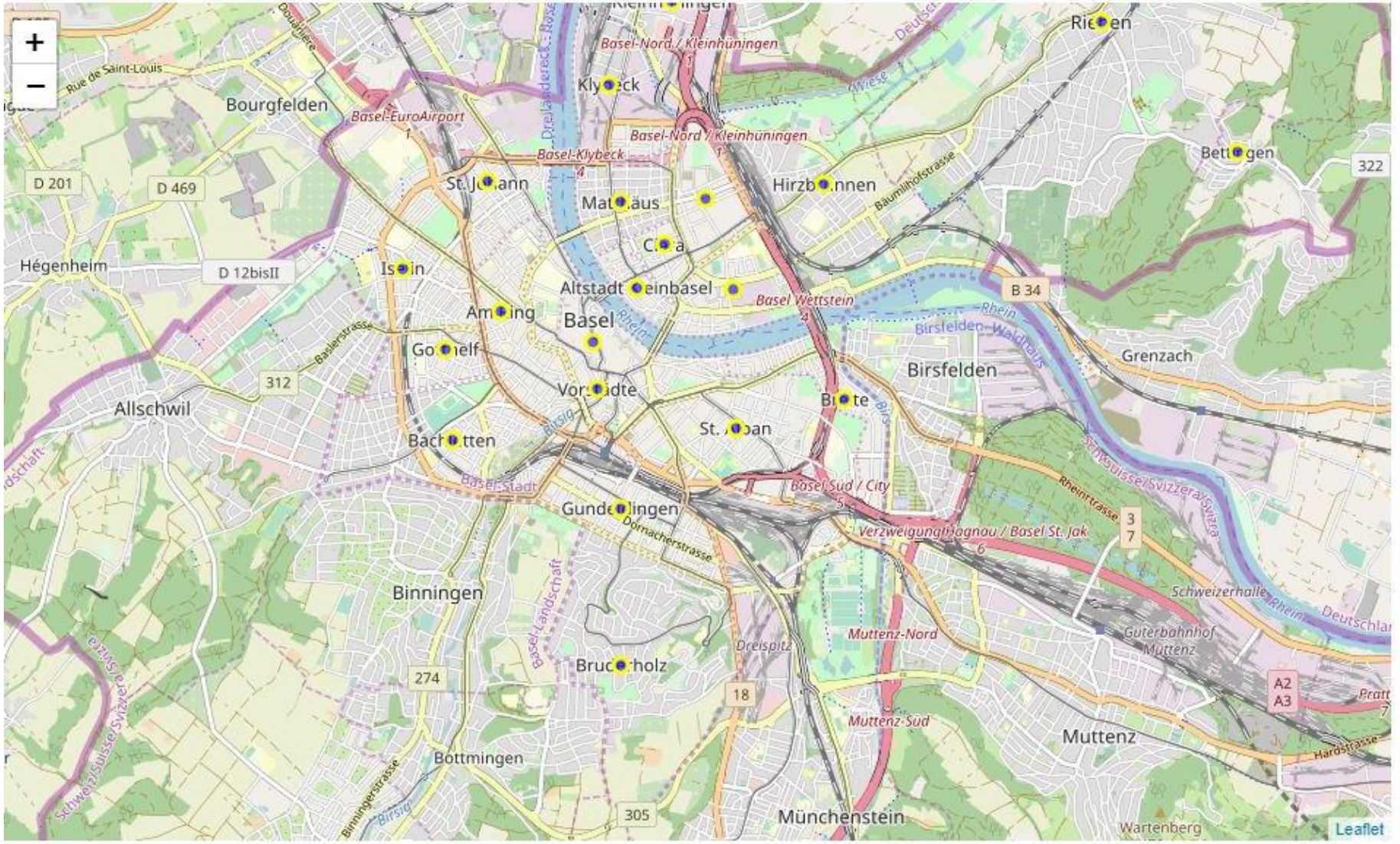
	name	location	Latitude and Longitude
0	Basel, Altstadt Grossbasel	(Altstadt Grossbasel, Basel, Basel-Stadt, 4001...	(47.5564274, 7.5882594, 0.0)
1	Basel, Vorstädte	(Vorstädte, Basel, Basel-Stadt, Schweiz/Suisse...	(47.5526462, 7.5888037, 0.0)
2	Basel, Am Ring	(Am Ring, Basel, Basel-Stadt, 4003, Schweiz/Su...	(47.5587744, 7.5774773, 0.0)
3	Basel, Breite	(Breite, Basel, Basel-Stadt, Schweiz/Suisse/Sv...	(47.5518091, 7.6178526, 0.0)
4	Basel, St. Alban	(St. Alban, Basel, Basel-Stadt, 4052, Schweiz/...	(47.5495654, 7.6050522, 0.0)
5	Basel, Gundeldingen	(Gundeldingen, Basel, Basel-Stadt, Schweiz/Sui...	(47.5432192, 7.5914854, 0.0)
6	Basel, Bruderholz	(Bruderholz, Basel, Basel-Stadt, 4059, Schweiz...	(47.5307985, 7.5916242, 0.0)
7	Basel, Bachletten	(Bachletten, Basel, Basel-Stadt, 4054, Schweiz...	(47.5485663, 7.571726, 0.0)
8	Basel, Gotthelf	(Gotthelf, Basel, Basel-Stadt, Schweiz/Suisse/...	(47.5558192, 7.5709523, 0.0)
9	Basel, Iselin	(Iselin, Basel, Basel-Stadt, 4055, Schweiz/Sui...	(47.5621963, 7.5659985, 0.0)
10	Basel, St. Johann	(St. Johann, Basel, Basel-Stadt, Schweiz/Suiss...	(47.5690856, 7.5759341, 0.0)
11	Basel, Altstadt Kleinbasel	(Altstadt Kleinbasel, Basel, Basel-Stadt, Schw...	(47.5606996, 7.5933825, 0.0)
12	Basel, Clara	(Clara, Basel, Basel-Stadt, Schweiz/Suisse/Svi...	(47.5640853, 7.5966293, 0.0)
13	Basel, Wettstein	(Wettstein, Basel, Basel-Stadt, Schweiz/Suisse...	(47.560508, 7.6047949, 0.0)
14	Basel, Hirzbrunnen	(Hirzbrunnen, Basel, Basel-Stadt, 5068, Schwei...	(47.5688726, 7.6154703, 0.0)
15	Basel, Rosental	(Rosental, Basel, Basel-Stadt, Schweiz/Suisse/...	(47.5677078, 7.6014909, 0.0)
16	Basel,	(Basel, Basel-Stadt, Switzerland, (47.5581077,...	(47.5581077, 7.5878261, 0.0)
17	Basel Matthäus	(Matthäus, Basel, Basel-Stadt, Schweiz/Suisse/...	(47.5674388, 7.5915404, 0.0)
18	Basel, Klybeck	(Klybeck, Basel, Basel-Stadt, 4057, Schweiz/Su...	(47.5767978, 7.5901493, 0.0)
19	Basel, Kleinhüningen	(Kleinhüningen, Basel, Basel-Stadt, 4019, Schw...	(47.583376, 7.5975738, 0.0)
20	Basel, Riehen	(Riehen, Basel-Stadt, 4125, Schweiz/Suisse/Svi...	(47.5816927, 7.6479737, 0.0)
21	Basel, Bettingen	(Bettingen, Basel-Stadt, 4126, Schweiz/Suisse/...	(47.5714149, 7.6639831, 0.0)

METHODOLOGY

Let now plot Basel city map, and as the second step let map the various neighbourhoods.

First of all, we need to identify Basel Latitude and Longitude:

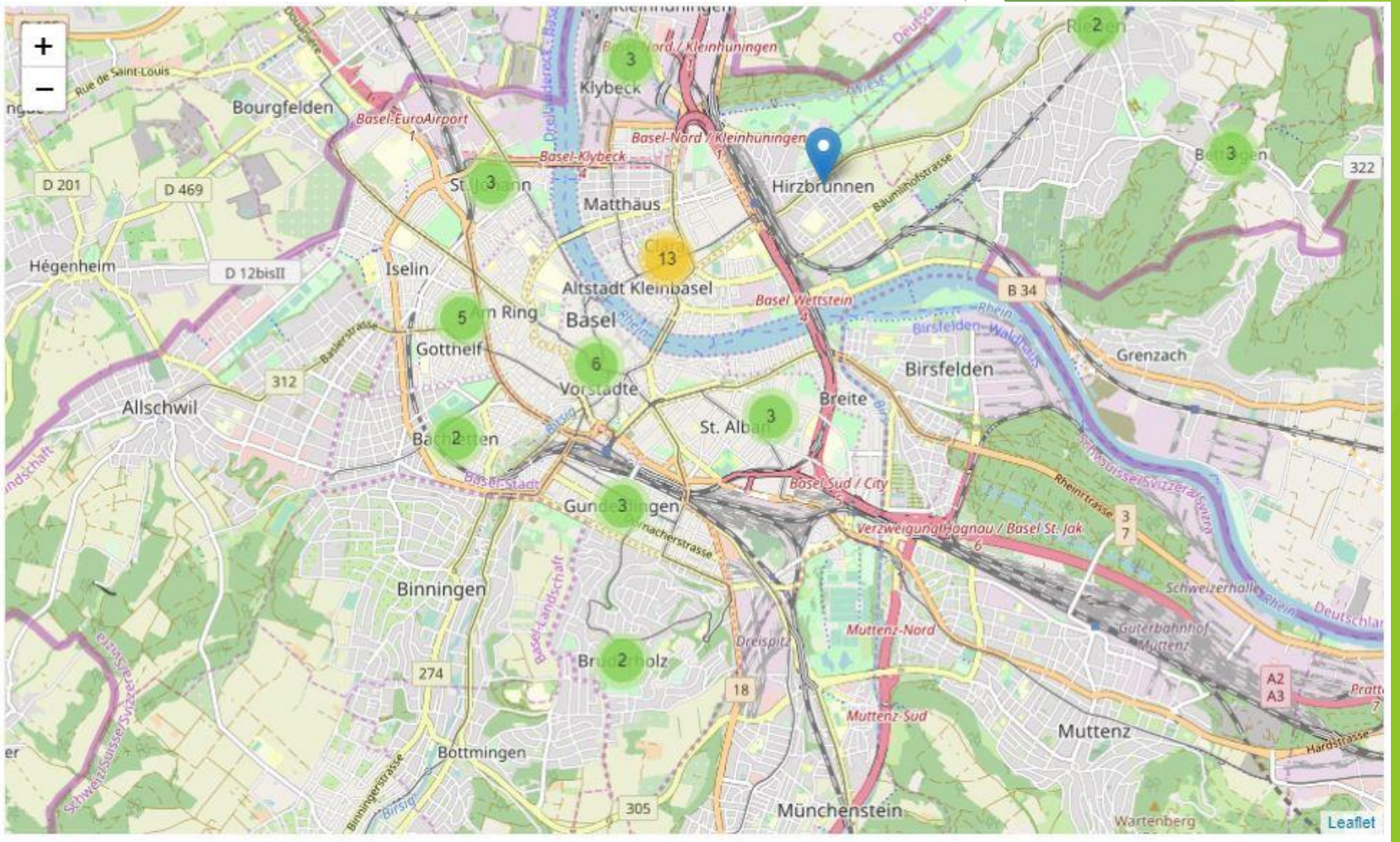
- Latitude: 47.55
- Longitude: 7.6



METHODOLOGY

- We need now to figure out how is the actual Pizzeria market in Basel. In order to do so, we are going to scramble data from TRIPADVISOR
- Data Scrambled are:
- Restaurant Name
- Price [0-5]
- Evaluation[0-5]
- Location

From the location, it is possible as well to extrapolate related latitude and longitude, clustering the restaurants altogether, according to the respective area.



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District	Average Price	Average Evaluation	Pizzerias in the District
Altstadt Grossbasel	2.500000	3.500000	3
Altstadt Kleinbasel	2.250000	4.250000	4
Am Ring	2.500000	3.500000	2
Bachletten	2.750000	4.000000	2
Bettingen	2.000000	3.500000	3
Breite	2.500000	3.500000	1
Bruderholz	2.500000	3.750000	2
Clara	2.500000	3.400000	5
Gotthelf	2.500000	4.250000	2
Gundeldingen	2.500000	3.333333	3
Hirzbrunnen	2.500000	2.500000	1
Iselin	1.000000	4.000000	1
Kleinhüningen	3.000000	4.500000	1
Klybeck	2.750000	3.750000	2
Matthäus	2.500000	4.500000	1
Riehen	1.750000	2.250000	2
Rosental	2.500000	4.500000	1
St. Alban	2.500000	3.000000	2
St. Johann	1.833333	3.666667	3
Vorstädte	2.666667	3.166667	3
Wettstein	1.750000	3.500000	2

METHODOLOGY

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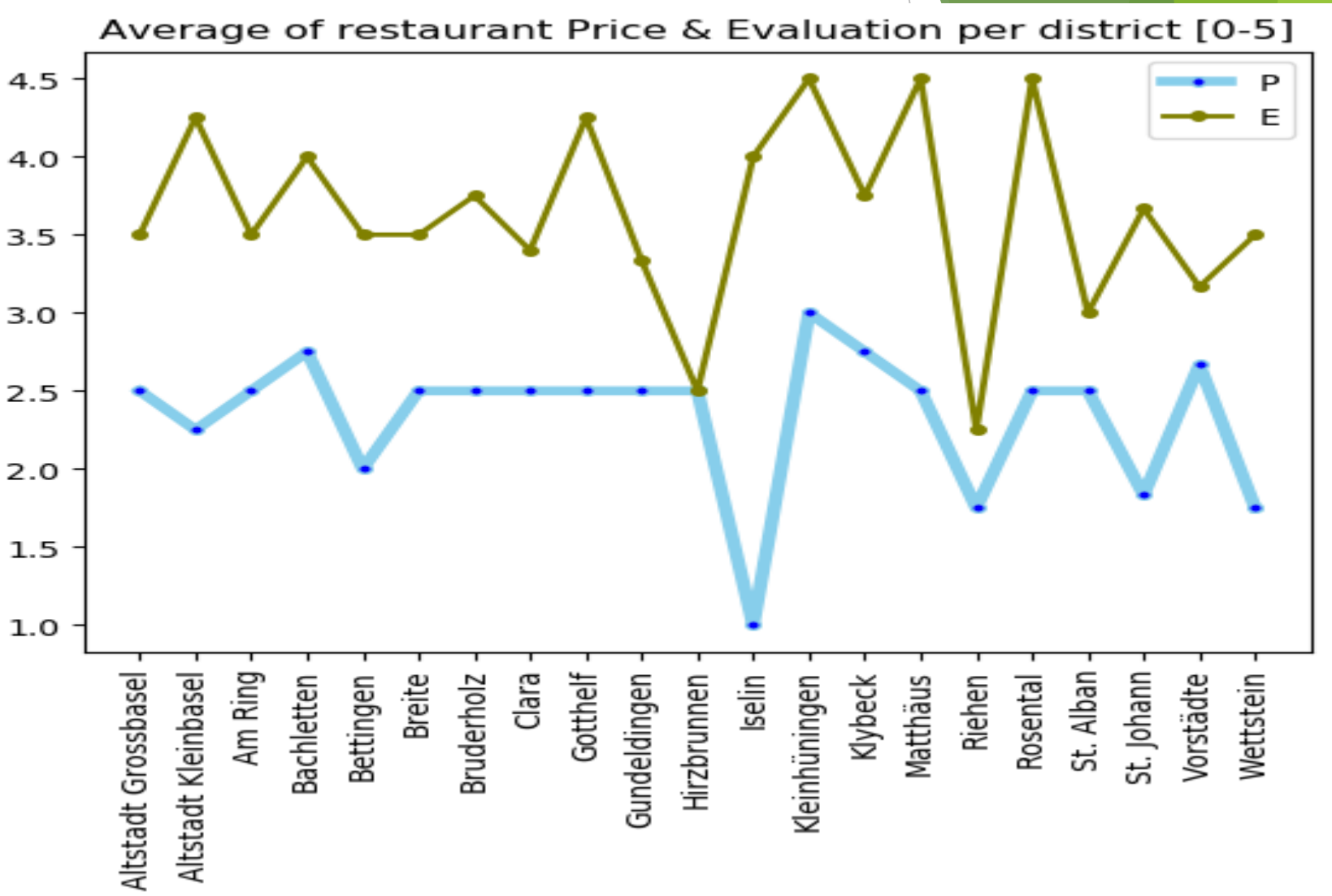

METHODOLOGY

It is now possible cluster all data in the same database

District	Restaurant Average Price	Restaurant Evaluation	Pizzeria number	Mittelwert	Median	Gini-Koeffizient4	Mittelwert.1	Median.1	Summe	Schweizer	Ausländer	Total	Citizens/Pizzeria
Altstadt Grossbasel	2.500000	3.500000	3	99020	51264	0.643	16990	6386	28475486	1836	715	2551	850.333333
Altstadt Kleinbasel	2.250000	4.250000	4	61429	42007	0.533	9082	4495	14658590	1494	927	2421	605.250000
Am Ring	2.500000	3.500000	2	77051	54114	0.518	11446	6497	70710469	6978	4160	11138	5569.000000
St. Johann	1.833333	3.666667	3	52412	41580	0.486	6658	3560	72358543	10500	8054	18554	6184.666667
Vorstädte	2.666667	3.166667	3	103696	58786	0.588	17096	7665	51698929	3117	1969	5086	1695.333333
Wettstein	1.750000	3.500000	2	76177	55101	0.496	11237	6831	38442001	3759	1796	5555	2777.500000

RESULTS

We can now use the below code in order to extrapolate the best District for each column:

```
test = Overall_Basel.set_index('District').select_dtypes('number')
test.head()
idx = test.idxmax()
idx
```

```
Restaurant Average Price    Kleinhüningen
Restaurant Evaluation       Kleinhüningen
Pizzeria number                     Clara
Mittelwert                      Bettingen
Median                          Bettingen
Gini-Koeffizient4               Bettingen
Mittelwert.1                    Bettingen
Median.1                       Bruderholz
Summe                              Riehen
Schweizer                          Riehen
Ausländer                      St. Johann
Total                              Riehen
Citizens/Pizzeria                  Iselin
dtype: object
```

RESULTS

Anyway, it seems that there is more than one main parameter that should trigger our decision. For this reason, we adapt the code in order to consider more than one parameter.

```
Restaurant Average Price          (Kleinhüningen, 2798.0, 7927865)
Restaurant Evaluation             (Kleinhüningen, 2798.0, 7927865)
Pizzeria number                          (Clara, 813.6, 15366138)
Mittelwert          (Bettingen, 396.3333333333333, 14270003)
Median              (Bettingen, 396.3333333333333, 14270003)
Gini-Koeffizient4   (Bettingen, 396.3333333333333, 14270003)
Mittelwert.1        (Bettingen, 396.3333333333333, 14270003)
Median.1                  (Bruderholz, 4707.5, 113567253)
Schweizer                    (Riehen, 10712.0, 160527515)
Ausländer        (St. Johann, 6184.666666666667, 72358543)
Total                        (Riehen, 10712.0, 160527515)
dtype: object
```

District	Citizens/Pizzeria	Summe	Restaurant Average Price	Restaurant Evaluation	Pizzeria number	Mittelwert	Median	Gini-Koeffizient4	Mittelwert.1	Median.1	Schweizer	Ausländer	Total
Altstadt ssbasel	850.333333	28475486	2.50	3.50	3	99020	51264	0.643	16990	6386	1836	715	2551
Altstadt einbasel	605.250000	14658590	2.25	4.25	4	61429	42007	0.533	9082	4495	1494	927	2421
Am Ring	5569.000000	70710469	2.50	3.50	2	77051	54114	0.518	11446	6497	6978	4160	11138
chletten	6854.000000	95444505	2.75	4.00	2	79537	58412	0.493	11820	7187	10646	3062	13708
ettingen	396.333333	14270003	2.00	3.50	3	135547	67711	0.661	22687	7970	891	298	1189

DISCUSSION

- The data clearly show that there is still room for a new Pizzeria in Basel. From the data we can state the following:
- The 47 Pizzerias currently in Basel are considered expansive but with average quality.
- Basel is a rich city, where each citizen has an overall average income of 53.000,00 CHF
- There are 5 quarters were it seems to e profitable open a new Pizzeria:
- Bettingen
- Bruderholz
- Clara
- Riehen
- St. Johann
- Among all of them, the one with the best combination of population, average income, other potential competitors in the area is **Bettingen**.

CONCLUSION

As a matter of fact, this analysis has been performed with limited data and with a very tight timeline. Anyway with the data available and with the analysis performed it was possible to:

- Analyse Basel Neighbourhoods main characteristics
- Analyse current Pizzerias location, prices, and ranking
- Propose the best locations where to open a new pizzeria, according to the data available.

THANK YOU