2020 | Par : Chappot Tifaine

New Italian Restaurant

What's the best place in Switzerland to operate?

Analysis report

IBM Data-science capstone project

Introduction

A business man wish to create a new italian restaurant to set up in one of the chief towns of the Swiss cantons.
I ask me in which city should the new Italian restaurant be set up to operate?

Data section

To answer this question, it will be necessary to determine which are the main cities of Switzerland as well as their geographical coordinates (Latitude, Longitude).

the dataset come from https://www.cadastre.ch/fr/services/service/registry/plz.html
and the chief towns from https://fr.wikipedia.org/wiki/Canton_(Suisse)

Then we will have to download on Foursquare API all the venues of the restaurant type near these cities. And then we can make statistic

Methodology

1. Analytic Approach
When all the data are merged we can count the number of Italian restaurant by cities and make a rate. After that we can use an unsupervised machine learning approach like clustering to
2. Data Requirements/collection
Please refer to data section
4. Data Understanding and Preparation
We also use basic statistical method to understand Data as count values, mean and then we dealing with missing value, error value and format of variables. We explored the data and prepared it for modeling.
We establish statistic of the rate of italian restaurant that exist in cities compared to the number of all restaurants. After that we can
5. Modeling and Evaluation
Let's build clustering and to classify all the cities and determine the best place for this new Italian Restaurant
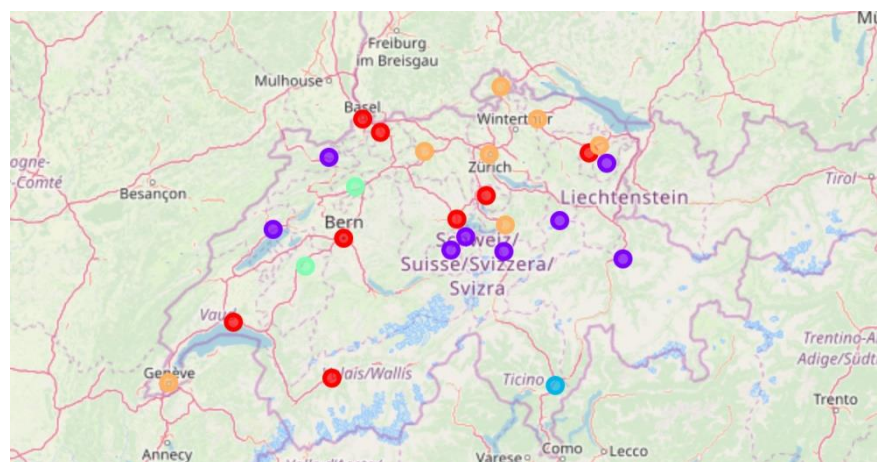
Results

Statistics basics

The table show the mean of Italian Restaurant existing compared to all restaurants. We can see that many cities haven't Italian restaurant as Stans or Delémont. In annex 1 you can see the number of venues with a categorie venue that contain the word "restaurant".

Ratio	Cities	Ratio	Cities
7.69%	Aarau	16.67%	Herisau
0.00%	Altdorf	14.29%	Lausanne
0.00%	Appenzell	22.22%	Liestal
15.79%	Basel	17.86%	Luzern
62.50%	Bellinzona	0.00%	Neuchâtel
21.74%	Bern	0.00%	Sarnen
0.00%	Chur	7.14%	Schaffhausen
0.00%	Delémont	12.50%	Schwyz
9.09%	Frauenfeld	20.00%	Sion
30.77%	Fribourg	30.00%	Solothurn
12.00%	Genève	5.00%	St. Gallen
0.00%	Glarus	0.00%	Stans
7.41%	Zürich	19.05%	Zug

Machine learning

We use clustering to compare cities with depending of the ratio calculated previously. All cities violet (cluster 1) on the map haven't Italian restaurant and for the greens and blues circles are cities with the big rate of Italian restaurants.

Discussion

According to the result section I would recommend to the business man to create his new Italian restaurant in one of the cities with the lowest rate and represented on the table below.

	Cluster Labels	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
1	1	Altdorf	Restaurant	Fast Food Restaurant	Swiss Restaurant	Vietnamese Restaurant	Japanese Restaurant
2	1	Appenzell	Swiss Restaurant	Restaurant	Vietnamese Restaurant	Fast Food Restaurant	Japanese Restaurant
6	1	Chur	Fast Food Restaurant	Swiss Restaurant	Mexican Restaurant	Restaurant	Vietnamese Restaurant
7	1	Delémont	Fast Food Restaurant	Vietnamese Restaurant	Vegetarian / Vegan Restaurant	Argentinian Restaurant	Asian Restaurant
11	1	Glarus	Swiss Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Kebab Restaurant	Argentinian Restaurant
16	1	Neuchâtel	Restaurant	French Restaurant	Swiss Restaurant	Mediterranean Restaurant	Mexican Restaurant
17	1	Sarnen	Restaurant	Vietnamese Restaurant	Kebab Restaurant	Argentinian Restaurant	Asian Restaurant
23	1	Stans	Swiss Restaurant	Restaurant	Asian Restaurant	Middle Eastern Restaurant	French Restaurant

Foursquare API give not all restaurants that exist in Switzerland as you can see in annexe 1 for Sarnen and Delémont. so i think this result is not relevant. I used Foursquare because it was requested for this capstone.

Conclusion

In conclusion this result give a trend but in true life i recommend to not use the Foursquare application in Switzerland to solve and take the same methodology on the google map Place API. Other analyze including the number of Italian residents by cities could improve the sensitivity of the results.

Annex 1

Number of venues by cities

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Aarau	26	26	26	26	26	26
Altdorf	5	5	5	5	5	5
Appenzell	6	6	6	6	6	6
Basel	19	19	19	19	19	19
Bellinzona	8	8	8	8	8	8
Bern	23	23	23	23	23	23
Chur	10	10	10	10	10	10
Delémont	1	1	1	1	1	1
Frauenfeld	11	11	11	11	11	11
Fribourg	13	13	13	13	13	13
Genève	25	25	25	25	25	25
Glarus	3	3	3	3	3	3
Herisau	12	12	12	12	12	12
Lausanne	28	28	28	28	28	28
Liestal	9	9	9	9	9	9
Luzern	28	28	28	28	28	28
Neuchâtel	11	11	11	11	11	11
Sarnen	1	1	1	1	1	1
Schaffhausen	14	14	14	14	14	14
Schwyz	8	8	8	8	8	8
Sion	15	15	15	15	15	15
Solothurn	20	20	20	20	20	20
St. Gallen	20	20	20	20	20	20
Stans	12	12	12	12	12	12
Zug	21	21	21	21	21	21
Zürich	27	27	27	27	27	27