

Capstone Project

The Battle of the neighborhood

Introduction

In Italy, pizza is a typical dish that calls visitors from all over the world.

Unfortunately, pizzerias are increasing in many of the most important Italian cities and find the perfect location for growing the commercial activity can be a hard problem.

In order to overcome this issue, the idea is to choose the right location by providing data about the average income of each Neighborhood in Bologna(Italy) as well as the frequency of pizzerias around the city.

Data Used

To provide the stakeholders the necessary information I'll be combining the Average income per Neighborhood with Foursquare API to collect competitors on the same neighborhoods.

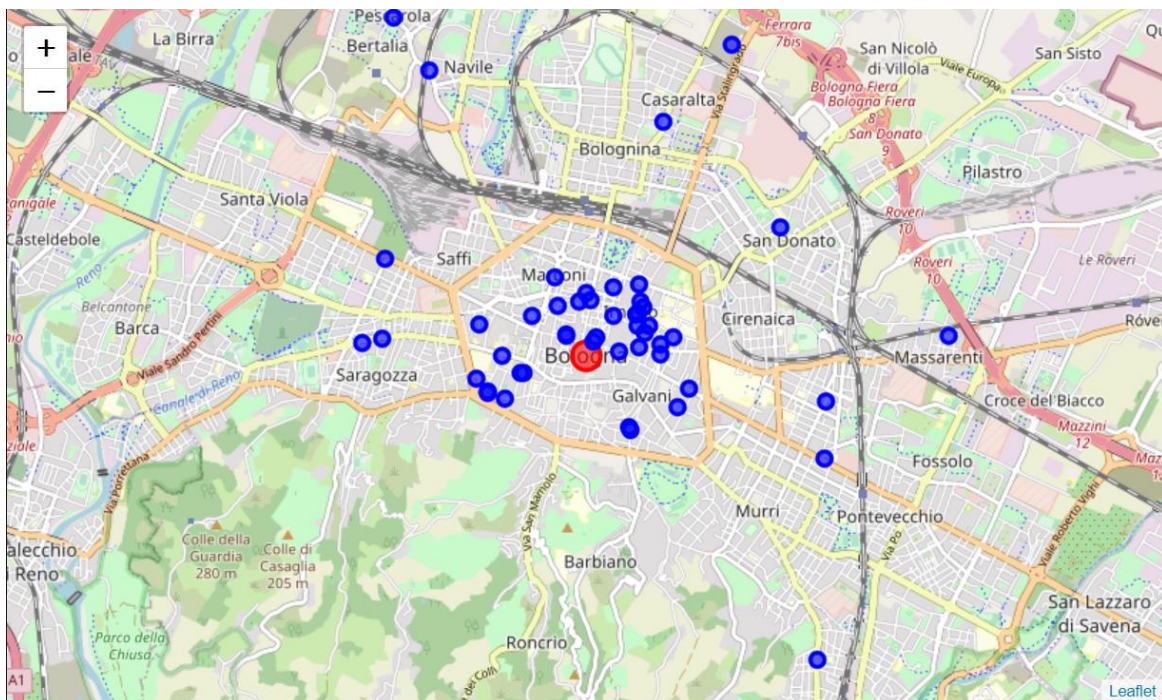
Bologna's average income data are publicly available at this website:

<http://inumeridibolognametropolitana.it/quartieri/reddito-et%C3%A0>

Methodology section

In the first part, I would inspect the distributions of pizzerias around 7.5 km from the center of the city in order to visualize the positions at greater frequency.

And as you can see in the figure below, the center of the city is the area characterized by the largest number of pizzerias compared to areas outside the center.



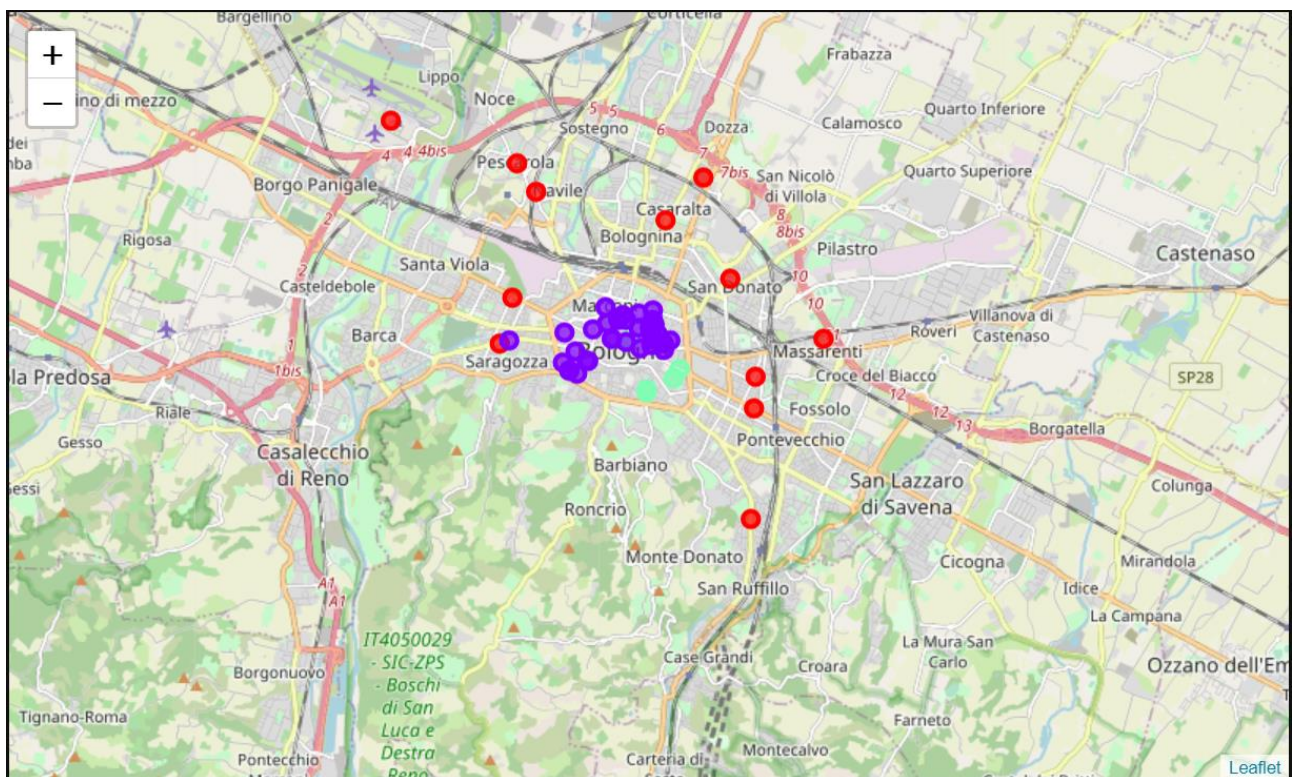
This distribution of pizzerias is a clear sign of the prevalence of this commercial activity in the city. Indeed, 50 pizzerias are located in Bologna.

But it is also true for those who want to invest in this sector that it is possible to mark the best place to do it. In order to achieve this goal, I used the prevalence of pizzerias in Bologna with the average income distributed between neighborhoods and the location, preferring the central location instead of those in suburbs.

This consideration is due by the fact, and how I said previously, that this commercial activity is preferred by foreign visitors often.

So, after a searching with Fourquare API with a request ('pizzeria'), I combined in a unique dataset this information with those deriving by the dataset of average income between neighborhoods.

Then, I applied a K-mean cluster analysis in searching the three cluster that could help me to find the best location based on the Average Income and Prevalence of pizzerias in the area.



Results

As you can see in the previous figure, the three clusters are clearly represented.

In the cluster with red colour, or Cluster_0 we can find pizzerias that are outside the center of the city. And inspecting the cluster, as you can see in the table below, you can appreciate the fact that this cluster represent the 24.5% of the total sample with 12 pizzerias whit an average income of 22.482 euro/year.

	name	lng	Income
6	pizzeria a modo mio	11.316141	23.289
7	Pizzeria Da Carlo	11.318903	23.289
14	Ristorante Pizzeria Rococo'	11.352389	20.452
21	Pizzeria La Livella	11.324174	21.430
25	Pizzeria Pinterre	11.371690	23.639
26	Pizzeria Naveed	11.360477	20.452
38	Pizzeria Vecchia Malga Famiglia Chiari	11.292691	21.430
39	Pizzeria La Pantera Rosa Sprint	11.386560	24.333
43	Pizzeria da Antonello - Drago Verde	11.370914	25.544
44	Pizzeria Pantera Rosa	11.319910	21.343
46	Mimi Ristorante Pizzeria	11.371910	24.333
48	Ristorante Pizzeria Tenerife	11.366457	20.247

In the cluster with violet colour, or Cluster_1 we can find pizzerias that are mostly in the center of the city, with only one exception.

Inspecting the cluster, as you can see in the table below, you can appreciate the fact that this cluster represent the 67.35% of the total sample with 33 pizzerias whit an average income of 31.841 euro/year.

	name	lng	Income		name	lng	Income
				20	Pizzeria DOC	11.349272	31.722
1	Trattoria Pizzeria Belle Arti	11.349946	31.722	22	pizzeria gli archi	11.346359	31.722
2	Pizzeria Petroni	11.352031	31.722	23	Pizzeria Il Moro Bologna	11.342956	31.323
3	Pizzeria da Totò	11.330180	32.807	27	Pizzeria d'asporto Mascarella	11.349478	31.722
4	Ristorante Pizzeria Porta Saragozza	11.331225	32.807	28	Altero Pizzeria	11.343638	31.323
5	Pizzeria Nettuno	11.343895	31.722	29	Pizzeria Ristorante La Brace	11.349379	31.722
8	Pizzeria al Tavolaccio	11.318464	30.166	30	Pizzeria Il Sorriso	11.336588	31.323
9	Pizzeria Due Torri	11.346955	31.722	31	Il Saraceno Ristorante Pizzeria	11.340660	31.323
10	L'Antica Pizzeria Da Michele	11.346353	31.722	32	Pizzeria Che Si Mangia	11.332890	32.807
11	Pizzeria D'asporto Stella	11.342100	31.323	33	Ristorante Pizzeria il Saraceno	11.340605	31.323
12	Pizzeria da Roberto	11.339596	31.323	36	Pizzeria Casa	11.353471	31.722
13	Pizzeria Respighi	11.349222	31.722	37	Pizzeria dell'Eden	11.349392	31.722
15	Pizzeria Pugliese	11.350040	31.722	40	Pizzeria Marconi	11.339197	31.323
16	Pizzeria da asporto GM	11.335415	32.807	41	Pizzeria Due Torri 2	11.333229	32.807
17	Pizzeria GM	11.335207	31.722	42	BarbPizzeria Aldrovandi	11.351938	31.722
18	Pizzeria D.O.C	11.349003	32.807	47	Pizzeria Nosadella	11.331242	32.807
19	Pizzeria Emilia	11.350578	31.722	49	Pizzeria Saragozza 55	11.329867	32.807

In the last cluster with cyan colour, or Cluster_2 we can find pizzerias that are in the center of the city, but each located in sud-est area.

Inspecting the cluster, as you can see in the table below, you can appreciate the fact that this cluster represent only the 10.20% of the total sample with 5 pizzerias whit an average income of 42.168 euro/year.

Discussion

Based on the findings showed above, after the clusters inspection and the consideration that we taken into account developing the analysis, we can appreciate the fact that the best place to open a new pizzeria in Bologna is in the area of cluster_2.

This conclusion is based by the fact that only 5 pizzerias are located in the area of the cluster and the average income/year is the highest between the neighborhoods that have pizzerias in their areas. Moreover, the pizzerias in the cluster are located in city center, that is the area most visited by tourists.

Conclusion

This project had the aim to find the best location for those who wanted to open a new pizzeria in Bologna. This was based on the presence of pizzerias in Bologna in a radius of 7.5km from the city center and the average income/year of neighborhood in the city. The findings showed the presence of a cluster that is the best place to open a new activity.

This study have some limitations, first of all, the income could be not the only one feature that we have to take into considerations, but also the presence of other activity in the area, or the mean price for pizza in the area.