Choosing a Location Where to Open a Restaurant

June 06, 2021

1. Introduction
1.1. Background

Located in the north coast of Portugal and famous for its food, wine and beaches, Porto has been growing as one of the most attractive destinations worldwide. This has not only been recognized by the prizes own but also by the increasing number of tourist arrivals - grew over 70% from 2013 to 2019.

This tendency has been followed by new investments in Porto and in diverse sectors - from real estate to the opening of new subsidiaries / offices of many multinational companies in the city.

1.2. Problem

Having said that, in this report we will examine the different municipalities in Porto and select the best locations where investors should focus on when deciding where to open a new restaurant. This will be done by analysing the existing venues and looking at the number of inhabitants in each municipality (market size)

2. Data
2.1. Data Sources

Since we are going to base our analysis in the current venues available in each municipality and in the dimension of the population, we can find all the info in https://simplemaps.com/data/pt-cities. It contains all the municipalities in Portugal, their location (latitude and longitude) and an estimate of the number of inhabitants.
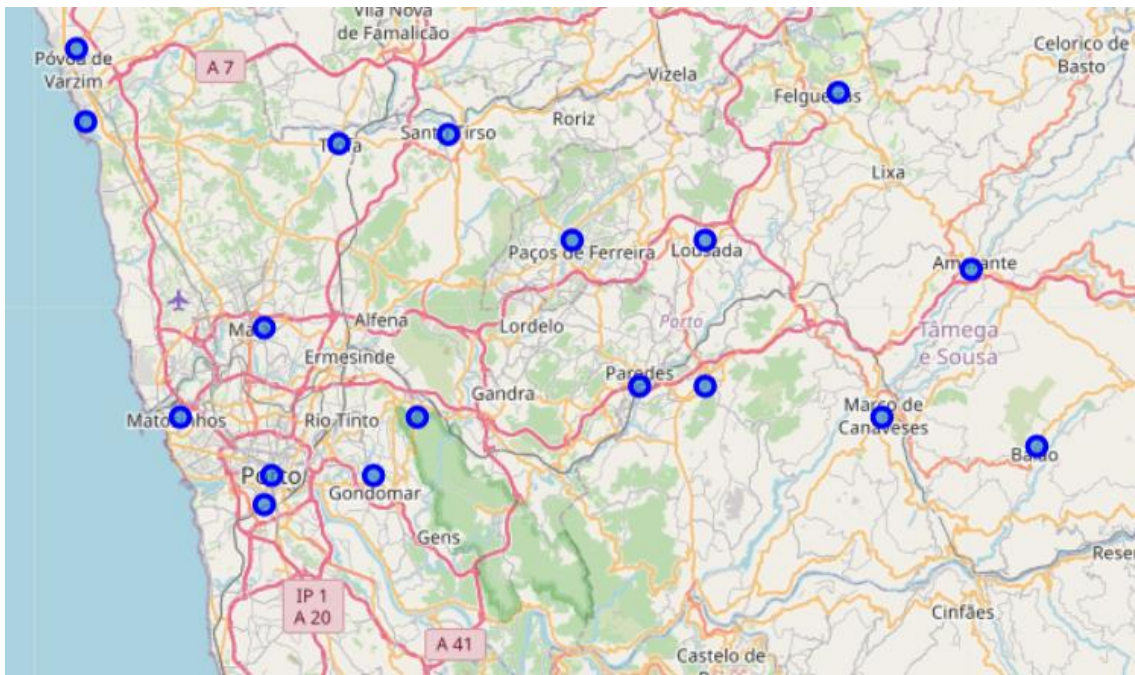
2.2. Data Cleaning

The first step to clean the data was to remove the redundant columns, namely the name and the ISO code of the country of each municipality (the dataset only contains information for Portugal) and the columns that were duplicated ('population_proper').

Then, in order to simplify the readiness of the data, the next step was to filter for the municipalities located in the city of Porto, which is the focus of our analysis.

After that, we dropped the municipalities with values equal to NaN (9 observations) and reset the index.

Our final dataset consisted in 18 rows (all the municipalities) and 6 columns (municipality name, latitude, longitude, district, type and population).
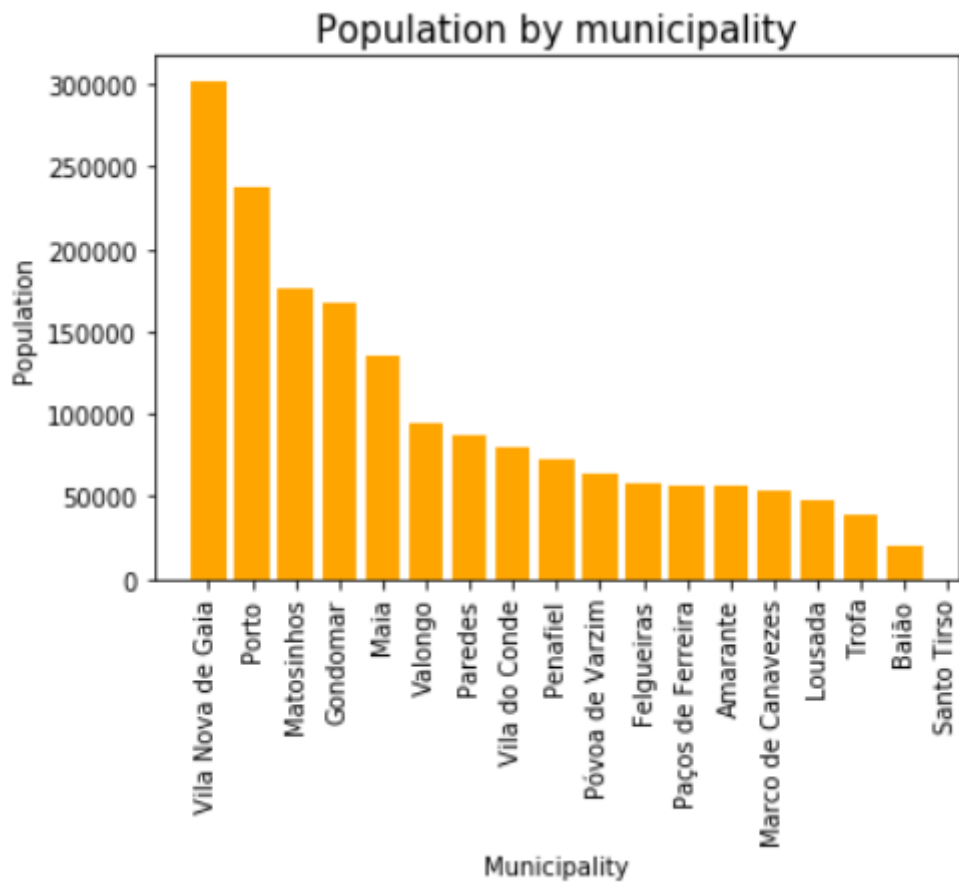

2.3. Venues Data
We retrieved the data of the venues located in each municipality using the Foursquare API, learned throughout this course.
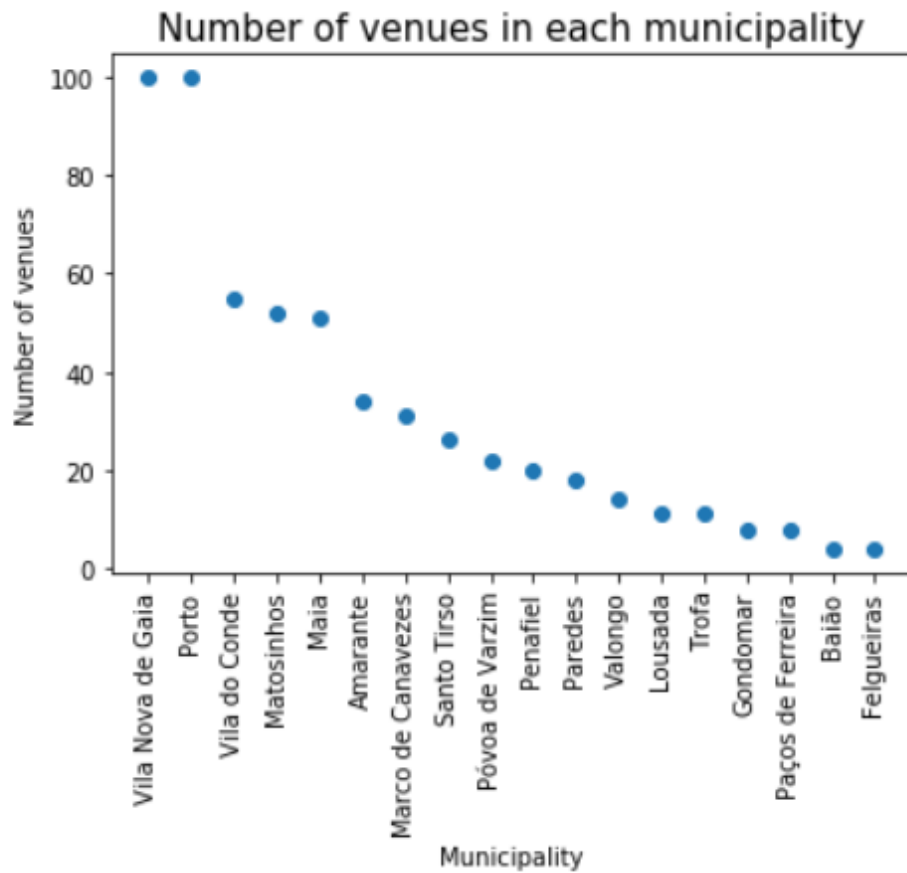
3. Methodology

3.1 Data exploration

We started by comparing the population in each municipality and we notice that there are only 5 with more than 100.000 inhabitants. The 3 most populated municipalities are Vila Nova de Gaia, Porto and Matosinhos.
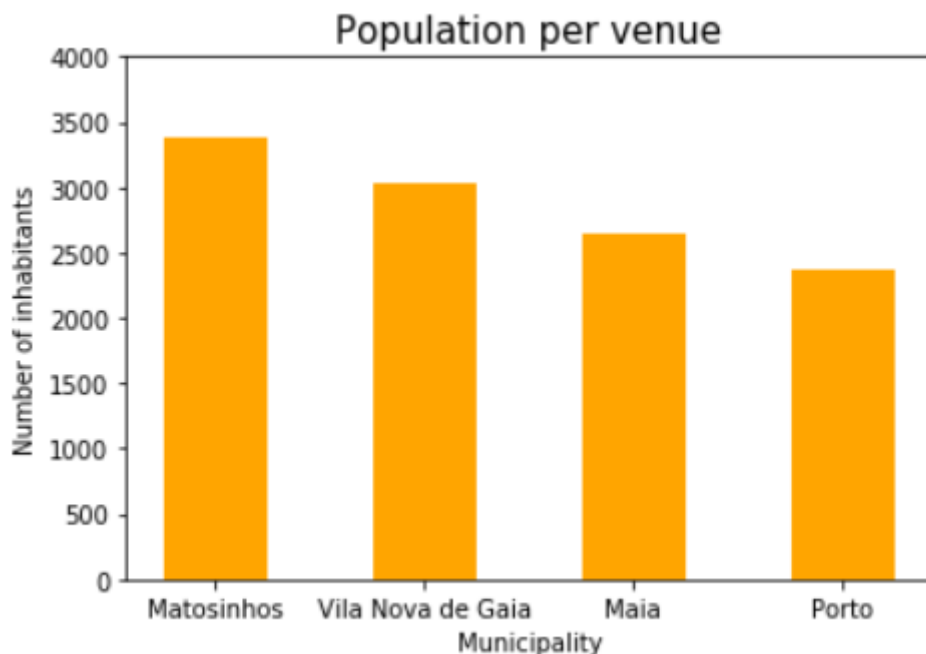
The next step was to check the number of venues located in each one the municipalities. As we can see, Vila Nova de Gaia and Porto (the two most populated) are also the ones with the highest number of venues – 100 (before making the Foursquare API call, we specified that the limit of venues for each municipality should be 100).

Number of venues in each municipality

However, it is normal that places with more inhabitants have more venues. Therefore, the next step was to calculate number of inhabitants per venue in each municipality (Ratio = Population / # venues).
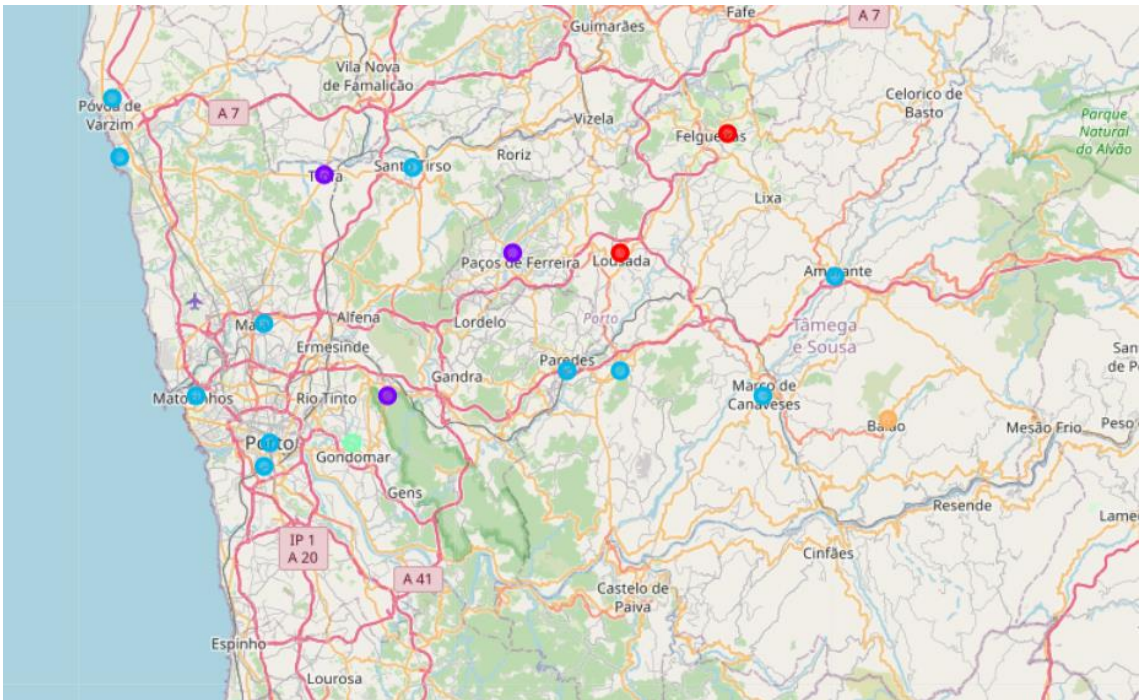
For purposes of simplification and to overcome possible missing information about the venues, we computed the Ratio only for the municipalities with population above the mean (> 102,684) and with more than 50 venues.

We ended up with 4 municipalities, being Matosinhos the one with the most inhabitants per venue (= fewest venues per inhabitant).

Lastly, we analysed the type of venues in each municipality, and we found out that the most centred and most populated ones have identical profiles and belong to the same cluster.

City	Population	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
Vila Nova de Gaia	302295.0	Portuguese Restaurant	Restaurant	Bar	Café	Wine Bar
Porto	237591.0	Portuguese Restaurant	Hostel	Restaurant	Bar	Beer Bar
Matosinhos	175478.0	Bakery	Café	Seafood Restaurant	Restaurant	Sushi Restaurant
Gondomar	168027.0	Coffee Shop	Bar	Café	Seafood Restaurant	Scenic Lookout
Maia	135306.0	Café	Bakery	Portuguese Restaurant	Coffee Shop	Supermarket

4. Results

We started by analysing the population in each municipality and we saw that only 5 municipalities have a population of over 100k inhabitants and that all of them are located close to the city centre (Vila Nova de Gaia, Porto, Matosinhos, Gondomar and Maia).

Then, we analysed the concentration of venues (as compared to the population) in each municipality and we found out that Matosinhos is the municipality with the fewest venues per inhabitant.

Lastly, we analysed the type of venues in each municipality, and we saw a that Vila Nova de Gaia, Porto, Matosinhos and Maia belong to the same cluster.

However, by taking a deeper look, we discovered that while Vila Nova Gaia and Porto have restaurants as their most common venues, Maia and Matosinhos have not (instead, Bakeries and Cafés are the most common venues)

5. Discussion

Given our results, we think that the best location to open a restaurant is in Matosinhos.

1. **Population:** it has a population above average, which means that there is a larger market to exploit
2. **Location:** it is located near the beach and is close to the center, which is represents an opportunity to attract national and international clients and to mitigate business seasonality
3. **Low concentration:** when compared to the other municipalities, Matosinhos is the one with the most inhabitants per venues. This not only means that there is a larger market to supply but also that there is less competition
4. **Top existing venues:** unlike Porto and Vila Nova de Gaia, the top 2 most common venues in Matosinhos are not restaurants, which might be a signal that there is a still a huge market left to exploit.

6. Conclusion

In the study we analysed the different municipalities in Porto and the type of venues located in each one. We analysed 4 main factors and found out that Matosinhos poses the best location for opening a new restaurant: population above average, located near the beach and close to the city centre, few restaurants given the number of inhabitants and the existing venues are not restaurants.