Applied Data Science Capstone

IBM Data Science Capstone

Battle of the Neighborhoods: Determining the best Neighborhood to purchase a home in Barcelona, Spain

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Introduction

Barcelona is the second-largest city in Spain with a population of 1.7 million, not accounting for Barcelona's metropolitan area with which it has a much larger population of 5.6 million distributed over 101 square kilometers. capital of the autonomous community of Catalonia of Spain and it is the second-largest city in Spain with a population of 1.7 million within the administrative limits. Barcelona's urban area has a much larger population of 5.6 million sprawled over 101 square kilometers. The city's urban population makes it the sixth most populous in the EU. The city is also the largest on the Mediterranean Sea, which makes it a extremely popular destination. (PopulationStat, 2020)

It's also one of the most densely populated cities in Europe. There is about 16,000 people per square kilometer in Barcelona, making it one of Europe's most densely populated cities. There are a couple neighborhoods where the population density is even higher, such as Eixample, where there are 36,000 people per square kilometer, and the La Sagrada Familia neighborhood, with 50,000 people per square kilometer. (PopulationStat, 2020)

As with many densely populated cities in the world, Barcelona also suffers of overpriced real estate and most home purchasers/renters struggle to find good value for their money when it comes to finding a home to live in. One of the main causes has been the rise of home vacation rentals in the city, which are far more lucrative for the tenants than permanent home rentals. This in turn has led to many protests from the locals who have been driven out of their boroughs due to many tenants opting for temporary vacation rentals. Despite the restrictions and limitations brought upon by the local authorities, vacation rental properties continued to open up and home rental prices continued to rise. (O'Sullivan, 2018)

Due to the COVID-19 pandemic ongoing worldwide, one of its many effects has been felt exceptionally in the real estate market in many countries, such as Spain. Leading to lowering prices of real estate in the big metropolitan areas, like Barcelona. Although rental prices have decreased by -3%, home purchases have actually increased by +1,3%. This phenomenon can be explained by several factors such as:
- Increase in people working from home, which has led to people moving back to their hometowns or cities in order to expend with the cost of rent.
- Decrease in students coming to live in the city, more programs online.
- Due to rise in unemployment and people taking pay cuts in order to keep their jobs, the government has allowed people to ask their tenants for a temporary rent reduction, which they are obliged to give given the current state of affairs.
- Decrease in tourist coming to the city, which has led to various vacation rental properties being turned into permanent rental properties, broadening the offer. (Idealista, 2020)
- People who had savings before the COVID-19 pandemic were waiting for home prices to decrease in order to get a good deal and have therefore

capitalized on the opportunity. It's important to note that the increase in home purchases have mostly been in the outer smaller towns relatively close to Barcelona, which means in some companies working from home will now be the standard.

Business Problem

Considering the elements presented above, we want to determine the best district for purchasing a house in Barcelona, considering certain, but not all, relevant factors that can determine its success such as:

- Venue density in each district, providing convenient services such as supermarkets, Pharmacies, bars, restaurants etc…
- Public Transport Accesibility.
- Housing price index per district.
- Compound Average Growth Rate of the Housing Price Index per district.

Target Audience for this Project

The main target audience for this project would be people or companies interested in purchasing properties in Barcelona, whether to live in or to rent long-term and sell for a profit in the future.

Data
In order to find a solution to the problem presented above, we'll be using the following data:

- I found the Geojson files of the city of Barcelona separated by district in a github repository from Martin Gonzalez, which were originally extracted from the Ayuntament of Barcelona website. These files have all the coordinates of Barcelona and will be used to create choropleth map of Housing Sales Price Index of Barcelona. (González, 2020)
- I used Forsquare API to get the most common venues of given Borough of Barcelona.
- I used the Housing Data Price Index provided by the Ayuntament de Barcelona, the municipality office of Barcelona, which in turn got the data from a study provided by Idealista, the most popular real estate website in Spain. (Ajuntament de Barcelona. Departament d'Estadística i Difusió de Dades, 2020)
- I used Google Search engine to get the center coordinates of each Borough.

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