MAA

MASTER DEGREE PROGRAM IN DATA SCIENCE AND ADVANCED ANALYTICS – MAJOR IN BUSINESS ANALYTICS

Houses Opportunities in Lisbon

Group W

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1. Introduction

House prices in Portugal differ from city to city and it is no brainer that the capital is one of the most expensive places to live. Nonetheless, Covid-19 has affected Real Estate, by decreasing the pace of the increase in prices in Lisbon. For example, in the capital, rents from apartments range from about €12 to €16 per sq. m. per month, so that a 120 sq. m. apartment can be rented for about €1,578 per month.

Thereby, it is interesting to study how prices differ in the heart of our country. Moreover, it is important for all people that live in the capital to be aware of the prices established for each parish in order to have a global picture of the housing market. In addition, apart from prices, it is also relevant to check the characteristics of the houses as the requirements depend on the buyer.

In short, we consider that this theme is both interesting and useful because, as a general rule, it is not easy to find a house in Lisbon, and with this app, you have access to the prices of each opportunity per parish, as well as the characteristics of each property. Furthermore, it is possible to observe the opportunities of three reputable Real Estates in a single dashboard, which facilitates the comparison between their offers.

The dashboard is available on the following link:
https://app.powerbi.com/view?r=eyJrIjoiYzM5OTcyZjMtYTkyMC00MzhkLWE2ZmMtYjBhNzdjM2FkM mQyIiwidCI6ImU0YmQ2OWZmLWU2ZjctNGMyZS1iMjQ3LTQxYjU0YmEyNDkwZSIsImMiOjh9

2. Dataset

The dataset was created through data given Real Estate companies: Era, Remax, and Century 21. It was easier and more accurate to ask for information from these companies as they have expertise in this area.

Our dataset is composed of the Typology of the houses (if they are 0 up to 6 room house), the Area of each house (in square meters), the Price (in thousands of euros), the name of the Parish, and also the Status with three possible options (New/Renewed/Used). We also have Longitude and Latitude to do a graphic analysis, concretely, a map visualization.

3. Visualization

To start with, we arranged our data in an Excel file and then starting by making small adjustments as changing some Portuguese terms to English ones. Then, to do the visualization we used Power BI as we recognize it as a complete tool to perform and create appealing and interesting visualizations for the users. Furthermore, we consider that Power BI will deal better with future updates in data rather than a Flask app.

The inspiration for this app was, in fact, based on personal experience. In the past, we needed to search for a house/room in Lisbon and the information regarding house opportunities was spread through each Real Estate website, which remains the same. In this way, we find out that a good thing to implement would be an app that encompasses several options from different Real Estates as the case of Hotels bookings websites that show different prices from different agencies, for example, like Booking.com or trivago.pt.

Additionally, we want our users to have the opportunity to search for the prices of each Parish before they go looking for a house. When we have an idea of the price of each sector and how the price varies when the typology varies, we can make a better decision when it comes to buying or renting. In addition, by knowing the average prices of each area clients tend to be less fooled by bad deals.

In this sense, we create some visualizations that englobe some of the things previously mentioned. Thus, focusing more on the dashboard itself, we divided it into two pages to better distinguish the information available and to make it clearer to the user.

On the first page, we decided to first let the user check the number of houses available in each parish and the price of each offer. For this, we built an interactive map that shows the Houses for sale by Parish, being the circles bigger or smaller according to the number of opportunities in each location. In addition, we found it useful to show the distribution of house prices by the parish through box plots, where the user can check the distribution of prices in each parish (the minimum price, maximum, median – shown in each box plot - and average value – black dots in the visualization), which is good as well to compare the different behavior of the parishes. Also, we added three cards to show the number of houses for sale in each Real Estate. On this page, to let the users play with the visualizations we added three slicers to allow them to choose different options according to their personal preferences regarding Parish, Status of the house, and Real Estate.
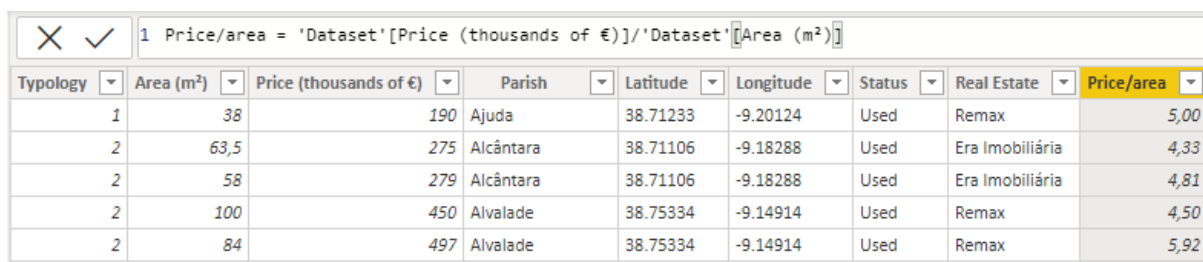
On the second page, we focused on the characteristics of the houses related to price, typology, and status. Accordingly, we built two pie plots, one that shows the percentage of available houses per house Typology (0 up to 6 room house) and another showing the percentage of offers per house Status (New, Renewed or Used). Following the previous visualizations, we created two scatter plots, one showing the relationship between price and typology and another exhibiting the relationship between price and status. Also, we added a map where we can compare for each parish the average price per square meter. Similarly, as we did on the first page of the dashboard, on this second page we added some slicers to let the user interact with the visualizations concerning the Parish, Status, Real Estate, and Typology.

To conclude, in both pages, we added in the bottom left of the dashboard our names and student number corresponding to Authors, and on the second page in the bottom right we added the sources of the data. Being all this said, we believe that our app is simple but at the same time captivating and

allows the user to play and interact with the visualizations which makes them feel valued as we thought the best ways to show the information we wanted to transmit to them but in an easy way.

4. Technical Aspects

As we already mentioned, we had the original data, but we needed to make small adjustments, more specifically, change Portuguese terms to English ones as the original data were in Portuguese. Furthermore, for a concrete visualization regarding the average price per area per parish, there was a need to create a new column by dividing the Price column by the Area column. We made these transformations in Power Query that is integrated into Power BI. Below is shown a small picture of our dataset, also showing the formula of the new mentioned column. The complete dataset, as well as the .pbix file of the Power BI dashboard and the link to the online app, are shown in the following GitHub repository: https://github.com/SoraiaCunha/DataVizDashboard

| ☓ ✓ | 1 Price/area = 'Dataset'[Price (thousands of €)]/'Dataset'[Area (m²)] | | | | | | | |

Typology ▼	Area (m²) ▼	Price (thousands of €) ▼	Parish ▼	Latitude ▼	Longitude ▼	Status ▼	Real Estate ▼	Price/area ▼
1	38	190	Ajuda	38.71233	-9.20124	Used	Remax	5,00
2	63,5	275	Alcântara	38.71106	-9.18288	Used	Era Imobiliária	4,33
2	58	279	Alcântara	38.71106	-9.18288	Used	Era Imobiliária	4,81
2	100	450	Alvalade	38.75334	-9.14914	Used	Remax	4,50
2	84	497	Alvalade	38.75334	-9.14914	Used	Remax	5,92

Figure 1 - Sample of the dataset

5. Discussion and Conclusion

Our project is useful to be used by users that are starting to look for a house and have no idea about the prices of the houses or how the price varies from place to place. By having this information, they can make more informed decisions and not be misled by a swindler or pay more than they should.

Nonetheless, our data is static and historical and, so, there is the need to change it from time to time. In the future, it would be relevant to create a type of code that changes the prices relative to inflation and market fluctuations or connect in real-time to the sources, in this case, to the Real Estate websites. Moreover, as the dashboard becomes a daily tool for people that are looking for a house, there is the need to create more features to make the price analysis even more precise. In this sense, there is space to have a suggestion box to listen to the users and their ideas with the view of improving the app according to their needs.

Although there are these previous limitations, we believe our app to be useful and captivating to the users and their needs of searching for a house in Lisbon. Moreover, we put ourselves in the shoes of the online users to select the most meaningful and simple visualizations but always enabling the user to interact with them.

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