Checkpoint III: Visualization Sketch

Group: G13
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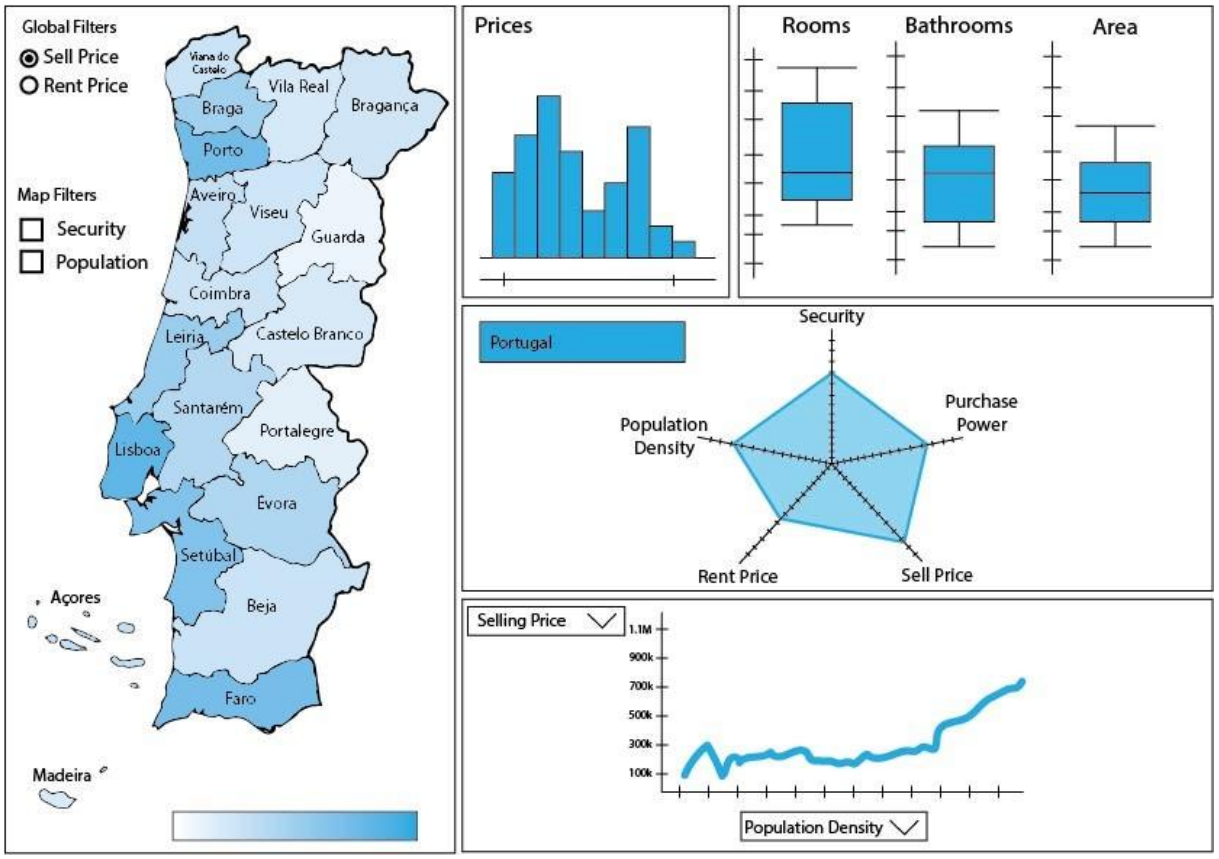
Overview



Visual Encoding

In this visualization we can choose a certain location in Portugal (either it is district, city or parish) and check the values of the attributes from that location. We can also, with a certain location selected, see the attributes of its properties and check the prices of either renting or buying.

- Choropleth Map: We will use a Choropleth Map of Portugal, where each city is the "Locations" attribute from the "locations_info" dataset. We can change the values that the color of each city represents by clicking on the options checkboxes. There are two Global Filters, for the Sell Price and the Rent Price, that change all the visualization, and two Map Filters, Security and Population, that just change the colors in the map. In the default scenario, where no filter was selected yet, the Sell Price is selected as the Global Filter and no Map Filter is selected. It will also be possible to drill down the "Locations" attribute from district to parish, by zooming the map. The Choropleth Map was chosen in order to allow some interaction to see other location attributes, since it will be used to select a certain location by clicking on it and showing the values of its attributes (from the "locations_info" dataset) in the Radar Chart.

Attribute	Type	Mark	Channel
“Locations”	Nominal	Area	Position
“AverageSellPrice”	Ratio	Area	Color
“AverageRentPrice”	Ratio	Area	Color
“TotalCrimes”	Ratio	Area	Color
“PopulationDensity”	Ratio	Area	Color

- Radar Chart: This chart will show the attributes of a location that was previously selected in the Choropleth Map. Each axis represents an attribute from the “locations_info” dataset. We created a derived measure, “SecurityRate”, that is 1000 - “CrimeRate”, which is the ‰ of people who never committed crimes. There is also a rectangle showing which location is selected, or “Portugal” by default (with no location selected), with the option to remove our selection.

Attribute	Type	Mark	Channel
“SecurityRate”	Ratio	Line	Position
“AverageSellPrice”	Ratio	Line	Position
“AverageRentPrice”	Ratio	Line	Position
“PopulationDensity”	Ratio	Line	Position
“PurchasePower”	Ratio	Line	Position

- Barchart: We will use a Barchart to represent the quantity of properties for each interval of prices. This Barchart will also allow us to interact with it, by clicking on the bars. That chosen bar will be the interval of prices of the properties represented in the Boxplot.

Attribute	Type	Mark	Channel
“Price”	Ratio	Area	x Position

- Boxplot: This chart will show the distribution of the attributes of properties in the selected location with prices between the interval selected in the Barchart. In the default case, when no location was selected, it should appear the distribution of the attributes from all the Portuguese locations. There are three boxes, one that shows the distribution of the number of “Rooms”, other showing the distribution of the number of “Bathrooms” and the other showing the distribution of the “PropertyArea”.

Attribute	Type	Mark	Channel
“Rooms”	Ordinal	Bar	Position
“Bathrooms”	Ratio	Bar	Position
“PropertyArea”	Ratio	Bar	Position

- Line Chart: We have chosen a Line Chart to represent how the “AverageSellPrice” and the “AverageRentPrice” values vary with either the “CrimeRate”, the “PopulationDensity” or the “PurchasePower” values. To achieve this, the Line Chart shows a line that can be represented by the values of either the “AverageSellPrice” or the “AverageRentPrice”, and we can interactively check which attribute we want to see in the x Axis, by clicking on the option corresponding to that attribute.

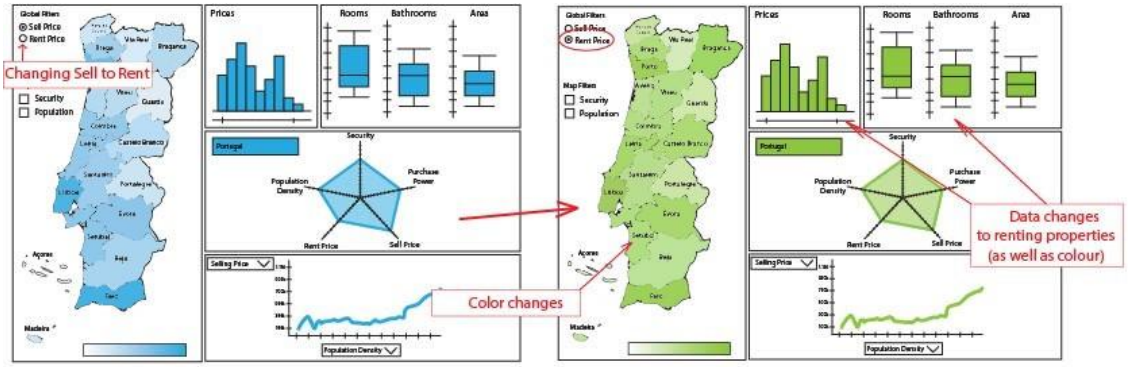
Attribute	Type	Mark	Channel
“AverageSellPrice”	Ratio	Line	y Position
“AverageRentPrice”	Ratio	Line	y Position
“CrimeRate”	Ratio	Line	x Position
“PopulationDensity”	Ratio	Line	x Position
“PurchasePower”	Ratio	Line	x Position

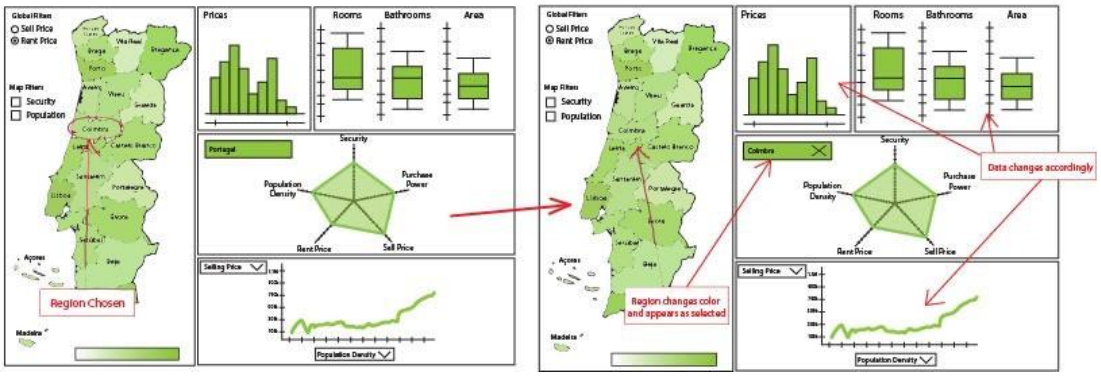
Answering the Questions

- **Question 1:** How is the quality of life in a particular region?

It is possible to answer **question 1** by selecting a certain location on the Choropleth Map and analyzing the Radar Chart with its information. By doing that we can compare the different attributes and infer the quality of life in each location.

- **Question 2:** In which regions would it be easier to pay the house rent?
  To answer this we can look at different idioms. Using the Choropleth Map, by making the saturation of the color of the area change according to the "AverageRentPrice" values, we can visually compare how the different rent prices vary from location to location, then we can select a location and look at the "locations_info" radar chart to verify the value of the "purchase power" attribute. In addition, it is useful to look at the Barchart to see the distribution of the rent prices.





- **Question 3:** Within a certain budget, what type of commodities can you expect from an apartment/house in a specific location?
  By selecting a certain price interval in the Barchart, we can check the Boxplot to see the number of "Rooms", number of "Bathrooms" and "PropertyArea" that are common with properties in that price range.

- **Question 4:** How does the population density of a certain location influence the search of properties in that location?
  We can answer **question 4** by looking at the Line Chart with the "PopulationDensity" option selected and analyse if there is a correlation between the "PopulationDensity" and the "AverageSellPrice" or the "AverageRentPrice". We can also check that by looking at those attributes in the Radar Chart.

- **Question 5:** How does the criminality rate in each city influence the prices of the properties?
  We can answer **question 5** by looking at the Line Chart with the "CrimeRate" selected as the x axis option and check if there is a correlation between the "CrimeRate" and the "AverageSellPrice" or the "AverageRentPrice". We can also analyse that by checking those three attributes in the Radar Chart.