Checkpoint IV: First Prototype

Group : G13
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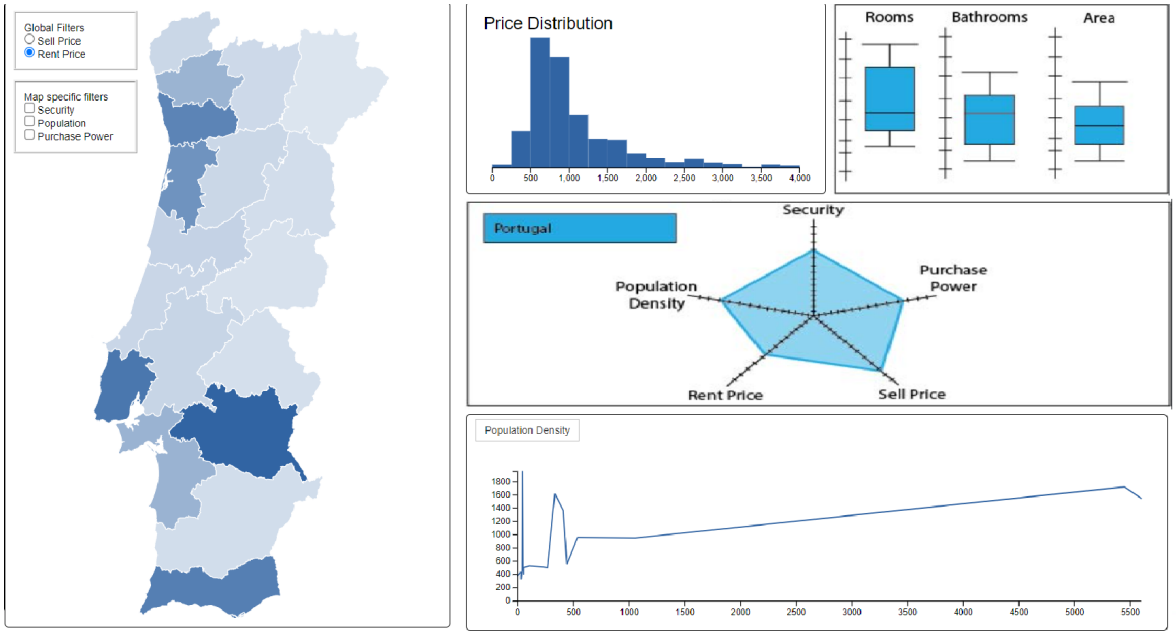
Layout

The layout of our prototype follows the organization that was previously defined in our Overall View sketch. It consists of five idioms, which are a Choropleth Map, a Line Chart, a Barchart, a Radar Chart and a Boxplot. The Choropleth Map occupies the left half of the visualization, with the other four idioms being in the right half. The controls for interacting with the visualization are the Global and Map Specific attribute filters present in the Choropleth Map, the brush present in the Barchart and the dropdown menu present in the Line Chart.

The idioms we didn't implement yet are represented by an image of that idiom from our Overall View sketch.

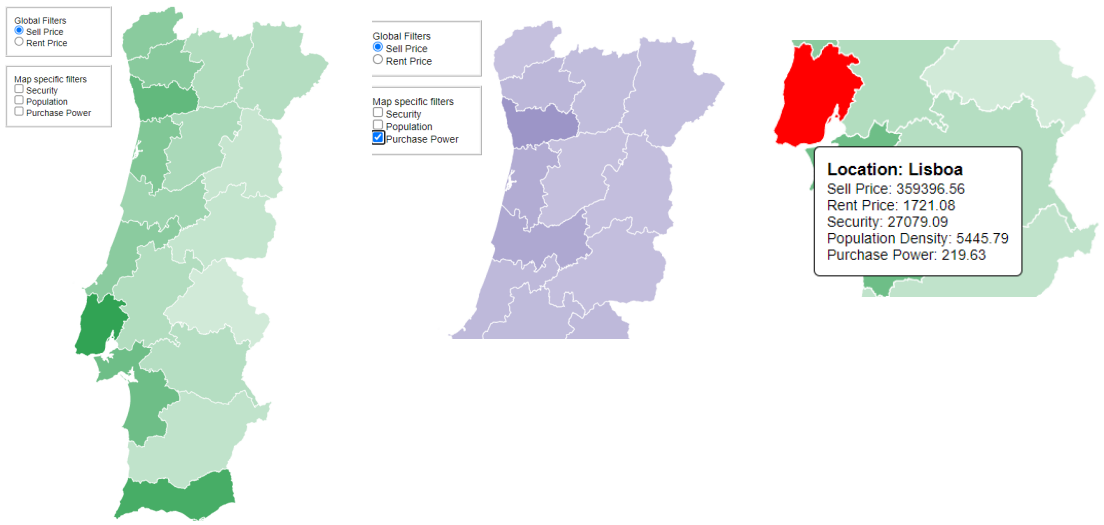
We chose white as the background color, since it's the one that matches the best with the overall look and feel of our visualization.The font we chose to represent the work is Helvetica Sans-serif since it's one of the most commonly used fonts worldwide, so the users already know it by heart, and they won't find trouble connecting with it.



Visual Encoding

So far, we implemented three of our five idioms. We can change the overall visualization with the Global Filters, by choosing if we want to see the Selling Price of the properties, making the color of the idioms green, or the Renting Price, making the color of the idioms blue. This changes the attributes that we can see and analyse in every idiom.
The three idioms that we implemented so far are:

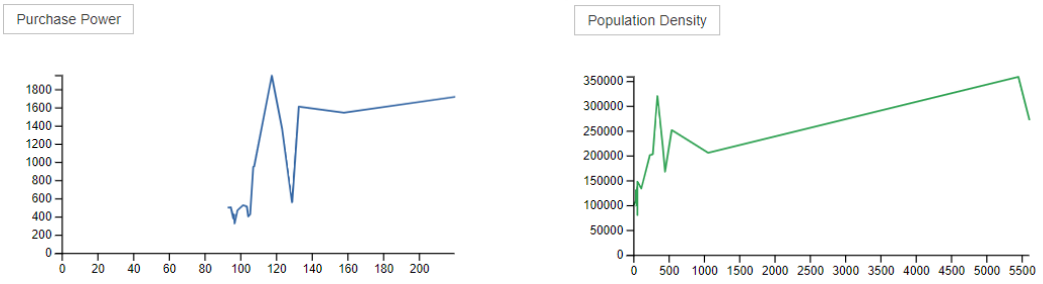
- **Choropleth Map:**



In the Choropleth map we are able to change the attributes we see in this idiom with both Global Filters and Map Specific Filters, the difference being that the Global Filters change the attributes presented in all the idioms in the visualization, while the Map's Specific ones change just the attribute present in the Choropleth Map only.

The color saturation at a specific location on the map varies according to the values of the chosen attribute at that location.
While hovering over a location, that location becomes red and a tooltip appears with information about the respective location. This is to allow users to have a relatively simple way to see the numbers if they need to extract the exact numbers from the visualization.
When we click on a certain district in the map, that district becomes selected, and that change is represented by the area of the district showing the color saturation with a red outline, affecting all the other idioms in the visualization, that go from showing information about Portugal to showing the values from that district. We can select up to five districts, with a message appearing if we choose more than five.
To unselect a district and go back to seeing all the values from Portugal in the other idioms, we click in the previously selected district (the one that appears with the black color).

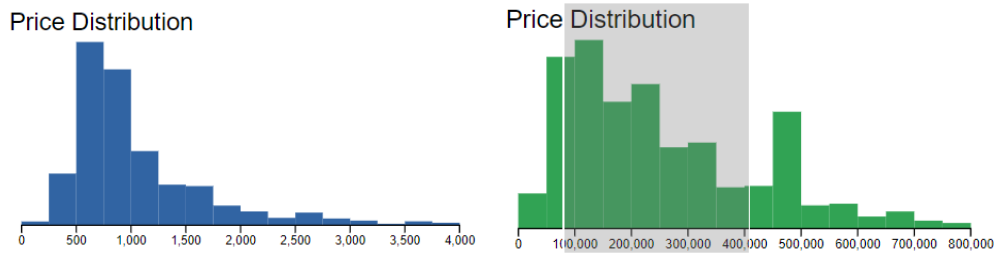
- **Line Chart:**



This idiom presents a way to compare the evolution of the prices with a characteristic from our dataset. The attributes from the X and Y axis are variable: the x axis can either represent Security Rate, Population Density or Purchase Power, while the Y axis takes it's attribute from the Global Filters applied to the visualization (Average Sell Price and Average Rent Price)

In the initial state, when no options are selected, it shows the Population Density values at the x axis.
The color of the line is related to the attribute selected in the Global Filter which is, just like in the other idioms, green if the Selling Price is selected or blue if the Renting Price is selected.
If a certain district was selected in the Choropleth Map, the Line Chart shows the distribution of the Average Prices (either Selling or Renting, depending on what we selected) of the parishes from that district. The Line Chart has a label for the x Axis chosen and the y Axis chosen.

- **Barchart:**
  This idiom shows the rent and selling price's distribution based on the selected global filter over a continuous interval. We placed the bars right next to each other to emphasize the continuous nature of the price's variable
  The data shown can present the overall information for Portugal, or it can be filtered by selecting a district in the choropleth map**,** showing information about a particular district in that case. We also implemented (although not fully yet) a brushing technique to filter the data that will be shown in the boxplots.



Implementation of Linking Mechanism

The **Global Filters box** changes the attributes that are shown in every idiom, changing it's color and filtering their data. The locations chosen in the **Choropleth Map** change all the values that appear in the other idioms of the visualization, showing only the values that regard that location. In the **Bar Chart**, using a brushing technique it will be possible to filter the values in the 3 **boxplots**, only showing the attributes in the selected price range.

The filters in the **Choropleth Map** were implemented by firstly parsing and adding the information to the json used to generate the maps, to apply pre-processing and generate all the scales to be used. After that, it's only a matter of choosing the filters, and applying the correct scale to the values. To filter with the districts we resort to state classes, that keep all the state of each idiom, and the visualization itself. This makes it scalable since it's pre-calculated, making the interactions faster than they would be by filtering the datasets each time, and easy to manage even when more idioms are linked, because all the state common to them is kept in the state class, and the particular state is kept in their own class, and even the scale changing is handled within themselves.