



Checkpoint III: First Prototype

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Prototype Architecture

For this Check Point, we made the Parallel Coordinates idiom.

The code is structured as follows:

index.html

- organize the Controllers Menu and the Parallel Coordinates
- define the available user interactions

filter.js

- define the functions to filter the data

controllers.js

- implement the Controllers Menu functionality
- define the interactions between the Controllers Menu and the charts

script.js

- fetch data from the dataset
- catch user interactions

style.css

- define the page layout and styling

parallel_coordinates.js

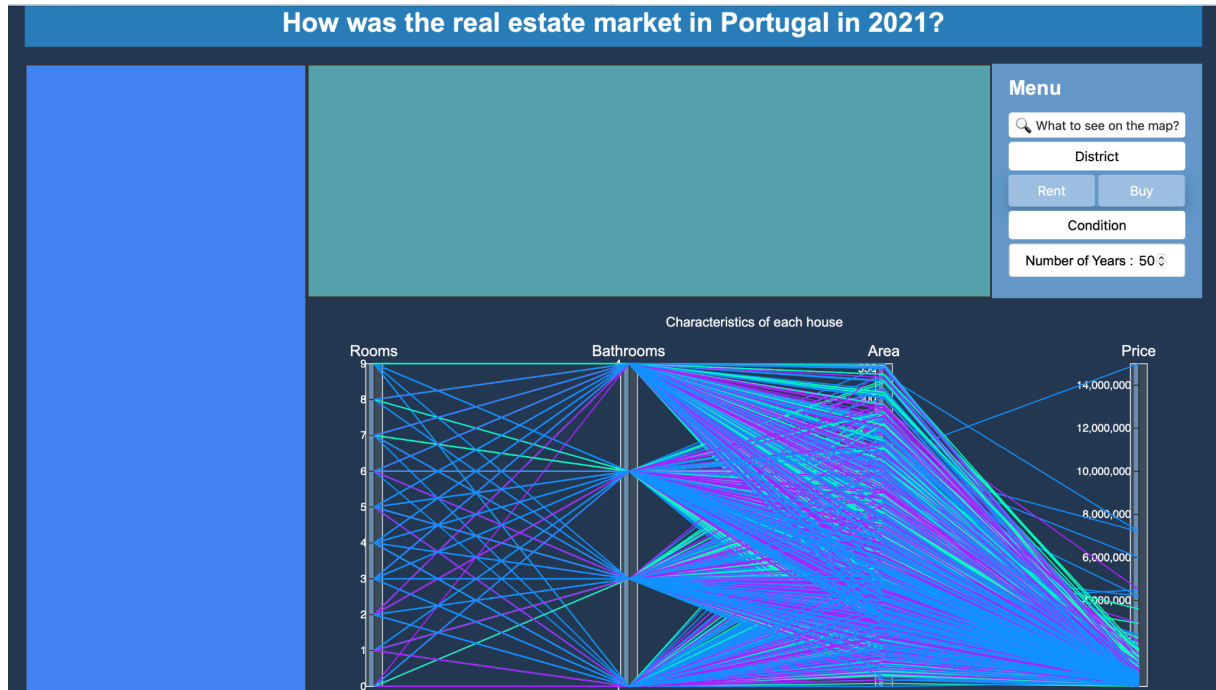
- implement the Parallel Coordinates functionality
- define the interactions between the Parallel Coordinates and the dataset

final_dataset.json

- the dataset being used

```
/src
├─ index.html
├─ filter.js
├─ controllers.js
├─ script.js
├─ style.css
├─ /idioms
│   ├── choropleth_map.js
│   ├── parallel_coordinates.js
│   └─ violin_plot.js
├─ /data
│   ├── initial_dataset.csv
│   ├── process-dataset.py
│   └─ final_dataset.json
```

Dashboard Layout



Initial Structure:

In this section, we present the initial structure of the Dashboard. The system has already implemented the Parallel Coordinates graphic.

Visual Placeholders:

For the remaining graphic components, which are still under development, we use visual placeholders in the form of rectangles. These placeholders indicate the space that the final graphics will occupy in the layout, providing a clear idea of the organization and distribution of each component. The arrangement of the rectangles is designed to optimize the use of space and maintain visual coherence, guaranteeing a smooth transition when the final graphics are implemented.

Data Processing

- Transforme the final dataset into .json because it supports complex data structures and integrates seamlessly with JavaScript, making data handling more efficient.
- Remove:
 - a. **outliers**: Outliers can skew analysis results, leading to misleading interpretations.
 - b. **Açores and Madeira islands**: These islands have distinct characteristics that may not represent the mainland. Excluding them maintains the relevance of the data for the principal cities.
 - c. **other conditions**: Removing non-relevant conditions simplifies the analysis, allowing for clearer and more applicable results to the main context.
 - d. **items that are not in the principal cities**: Excluding items outside the principal cities ensures that the analysis focuses on the most relevant and representative data for the target urban environment.
- Added 'id' column: For future interaction between the Parallel Coordinates and Choropleth Map.
- Added 'Zone': Portugal its divided in 3 zones: North, Center and South

Compared to Checkpoint 1, we decided not to include Municipality because we did not have enough data to cover all municipalities in Portugal. As a result, we chose to limit filtering the information by District instead.

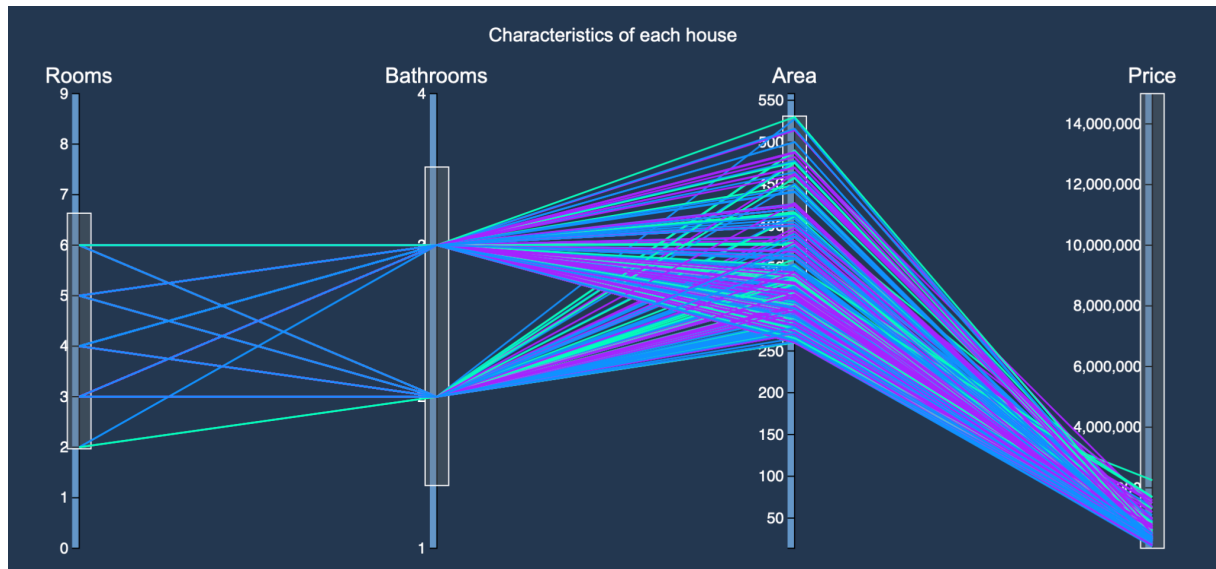


Chart Interaction

We have the following interactions in the axes, depending on the min. and max. value of the attribute: Rooms (quantity), Bathrooms (quantity), Area (m²) and Prices (euro, €).

The user can select the range they are interested in by pulling the maximum and minimum limits of each axis, displayed as a gray bar in Parallel Coordinates.

Chart Integration

We have global data and filtered data in script.js. Each time the data is filtered, it is updated accordingly. It is easier to store the data as a global variable in a single file, rather than storing it separately for each language. This approach simplifies dataset access, making it easier for all languages to retrieve the necessary data.

Controllers Menu

- When selecting a specific characteristic from the Controllers Menu, the corresponding dataset in Parallel Coordinates is updated. For example, if "Rent" is selected, only houses available for rent will be displayed in Parallel Coordinates.
- Characteristics can be:
 - What to see on the map? (will be implemented for Choropleth Map)
 - Districts (18 districts of Portugal)
 - Rent or Buy (if user wants to rent or buy or both)
 - Condition (New, Renovated or Used)
 - Number of Years (min. of 1 year and max. of 99 years)

Parallel Coordinates

- When hovering a line in Parallel Coordinates, the corresponding line of the house will be marked by a white color, and if the line is not being hovered over, it will be marked a contour line of the same color that stands out on the zone in Choropleth Map.
- When the Parallel Coordinates are changed, the data displayed will be filtered as the selection of characteristics.