Data Visualisation with and for AI: Assignment 3

This assignment is done in the group you have been assigned to for the third exercise.

Goal

The goal of this exercise is to build a dashboard—implemented in Plotly Dash—that enables some simple exploration of data. The dashboard should at least consist of the following:
- A main chart that gives an overview of the data set, for example, by means of a scatter plot, map, or heat map.
- On this chart, it should be possible to select individual data entries that are visible through an interaction mechanism, for example through hover or click.
- A second panel/part that shows detailed information on a selected entry. For example, for image data it could show the image.
- A checklist, range slider, or other component that enables the selection of a subset of the data.
- The main chart should show this selection, through highlighting, attenuation, or filtering (see Slides Lecture 2).
- You may add other components that you think would be helpful.

Data & example

You may use any data set of your choice for this exercise, for example about a topic that aligns with one of your interests or hobbies.

A data set that has a diverse set of interpretable attributes and is sufficiently large to be interesting, is this data containing election results in Germany. There is also metadata with socio-demographic information for each voting district. For your convenience, Edith pre-processed this data and we'll provide it through Ufora under the information for this exercise.

If you develop the dashboard using a larger data set, consider using only a sample during development. For example, develop the dashboard using only 1000 data points (or even 100) to keep it responsive. When the functionality is complete, then gradually improve the scalability and responsiveness to enable it to work with more data.

Approach

1) I would suggest to first make a sketch of the interface with the three or more components and which aspects of the data these correspond to.
2) Then implement the Dash core components.
3) Then write the callbacks to connect them.
4) Improve the layout and charts for clarity and consistency.

Other tips: if you want to improve the scalability, look at partial property updates (https://dash.plotly.com/partial-properties).

Account for what you have learned about the basics of charts (Lecture 1 & Exercises 1, 2), interaction mechanisms (Lecture 2), perception (Lecture 3) and the basics of good design (Lecture 4). *Do not rely on defaults too much*.

Make sure the dashboard is responsive. Modification of a checklist or other selection component may cause an update to the main graph that is a bit heavy. If clicking an object leads to an update elsewhere

that would take several seconds to be processed, consider the use of an explicit *update* button to update that graph, instead of every time the checklist is changed (you can use the `state' functionality).

Submission

Write a brief document to explain and motivate the dashboard, its design, the interactions, and the implementation. Submit this document and the implementation in a single zip file. If the data is large, do not include that but give a link instead. Make sure everything is included to run the dashboard.

The assignment is due Friday 7 November.