Assignment 7: Multivariate Data - Parallel Coordinate Plot **(20 points)**

Due: 17.06.2024 10AM

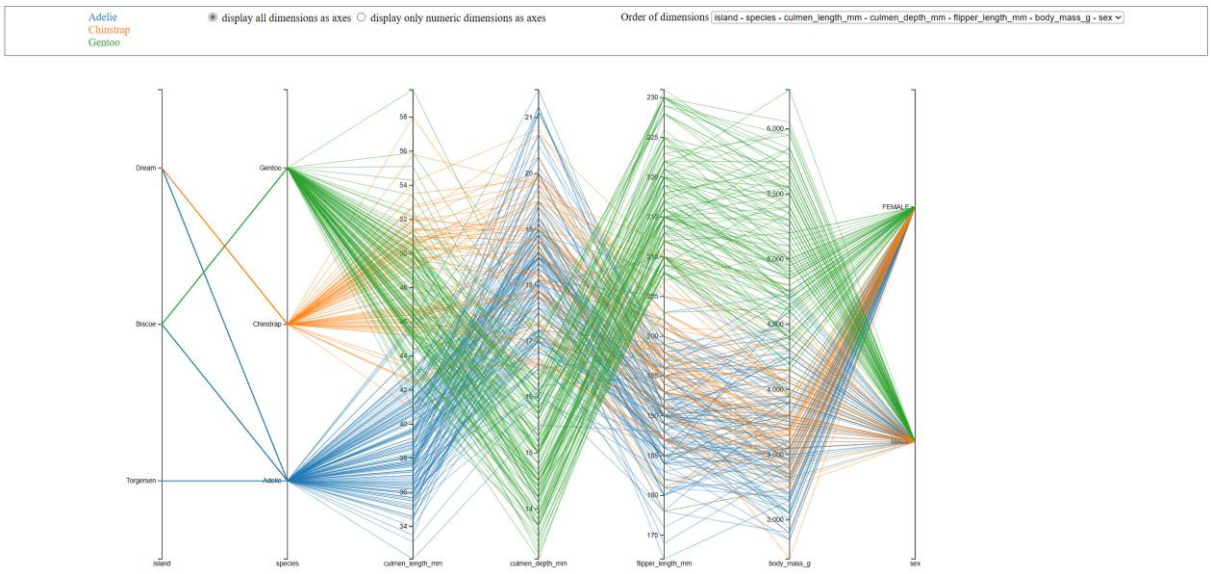

Figure 1: Parallel Coordinate Plot (PCP) of penguin dataset.

Task 1: Theory **(10 points)**

Task 1a) Solely looking at Figure 1, what can you say regarding

i) Distinguishable characteristics between the 3 penguin species (*Adelie*, *Chinstrap*, *Gentoo*)?
ii) Differences between male and female penguins in terms of body measurements?
iii) Pairwise (positive or negative) correlations of dimensions?
iv) Outlier(s) in the data?

Task 1b) Figure 1 shows both, numeric and categorical dimensions on the axes. Shortly explain possible advantage(s) and disadvantage(s) of including categorical dimensions as axes in the PCP.

Task 1c) Can you think of interactive features that could be added to the PCP in Figure 1 to further enhance data exploration? Which questions of Task 1b could benefit from these interactions and how?

Task 2: Programming **(10 points)**

Goal of this exercise is to implement a PCP with D3, where the user can choose between displaying all dimensions or only numeric ones as axes through radio buttons and adjust the ordering of the axes (dimensions) using a dropdown (see Figure 1). Attached to this exercise you will find a folder which contains an unfinished implementation of the PCP. Your task is to finish the implementation such that opening the *index.html* shows the plot as depicted in

Figure 1. To finish the implementation, follow the steps described as comments within the dedicated file. Each comment starting with *TASK* indicates a position you have to add code. Within the folder there are **4** files:

- **index.html**
  The main entry point of the visualization.
- **index.js**
  The main JavaScript entry point. All the coding tasks are in here.
- **index.css**
  Implements CSS rules for specific elements.
- **data.js**
  Initializes a variable called *data* and reflects the dataset we want to visualize.

Submission: Zipped folder including all files of the programming exercise (index.html, index.js, index.css, data.js) and a PDF/text file with the answers to the theoretical questions.

Please find yourself in Groups of **2 Students**. Only 1 member of the group must submit the exercise in ILIAS.