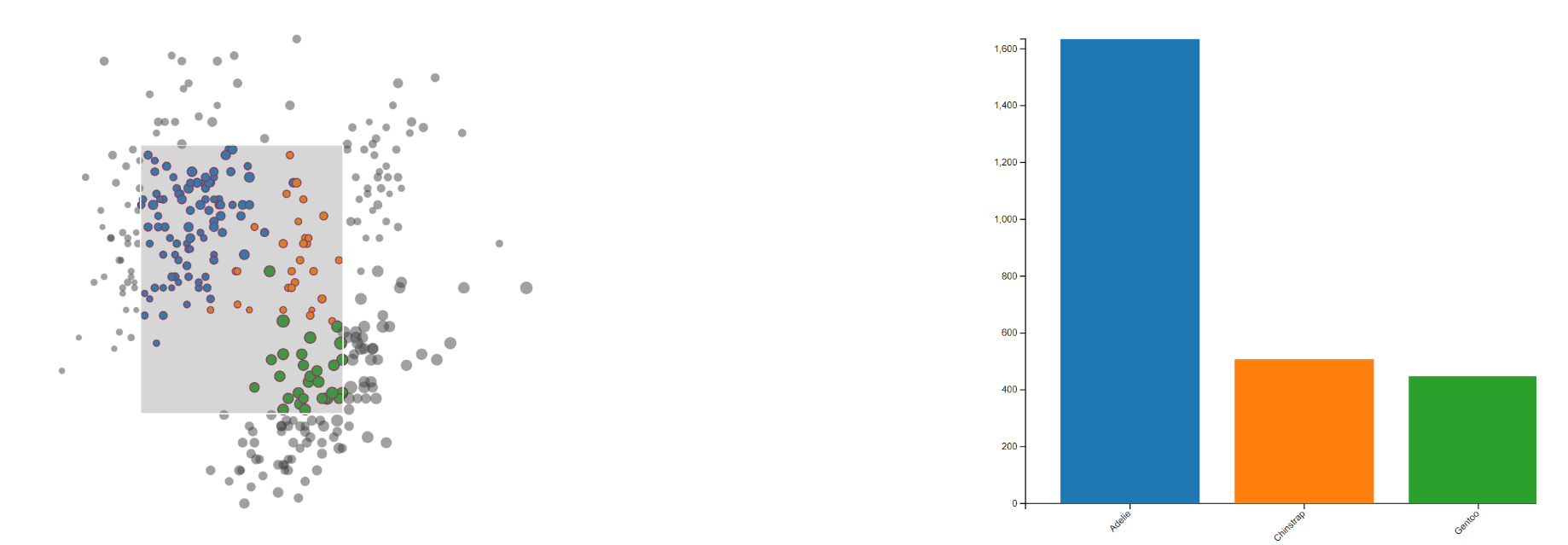
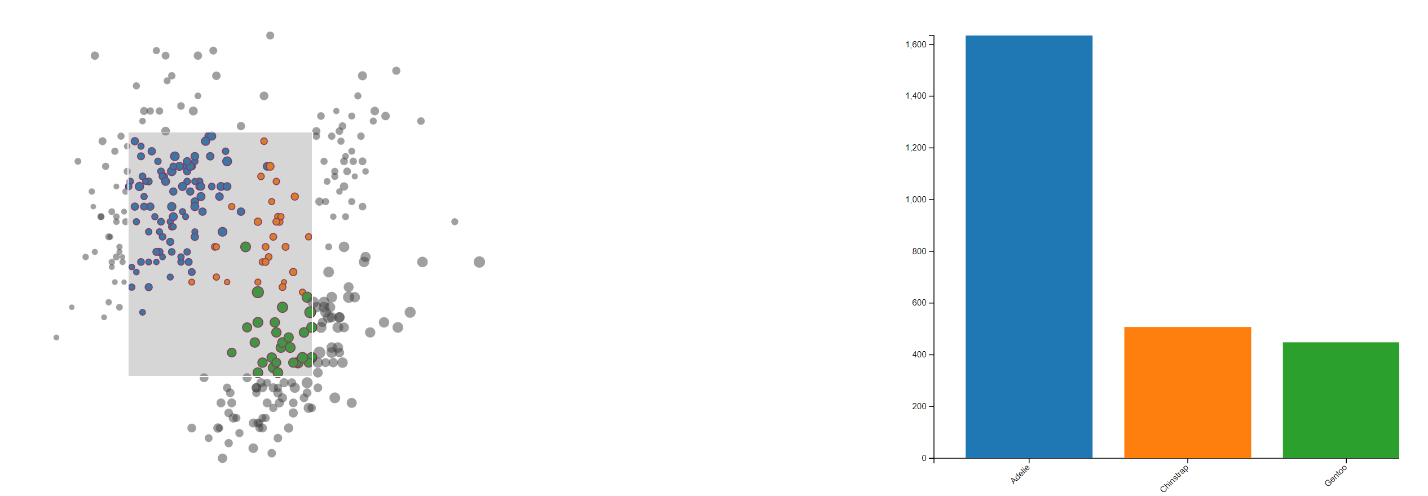
Exercise 8 (20 points)

**Due: 03.07.2022 8AM**

**Contributor 1: Mohammad Nomaan Husain**

**Contributor 2:**

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**Task 1: Linking and Brushing**

For this exercise, your task is to extend the scatterplot from exercise 4 with a brushing technique and dynamically create a Barchart based on the given selection.

The bars should display the culmen depth summed up by species based on the selected penguins.

A new selection should trigger:

* coloring the selected and not-selected points as displayed (see the index.css)
* the creation of new bars and scales

Your task is to finish the implementation such that opening the *index.html* shows the scatterplot as depicted in figure above. To finish the implementation, follow the steps described as comments within the dedicated file.

Tips:

* Use the d3-brush package to add a selection rectangle
* You can add event handlers to the brush (similar to previous events), see the possible events in the d3-brush documentation
* Based on the selection, modify the attributes of the points in the scatter plot
* Display a bar cart with the filtered data (you may either create a new one, or display/hide it)

**Task 2: Multivariate Data (6 points)**

**Task 2a) (1 points)**

Using your own words, describe what **multivariate** data is.

**Answer:**

**Task 2b) (2 points)**

Give one example of a multivariate visualizations techniques for each of the three marks introduced by *Bertin*: **Point**, **Line** and **Area**. Which additional visualization techniques exist?

**Answer:**

Point:

Line:

Area:

Other:

**Task 2b) (3 points)**

1. For a parallel coordinate plot**,** why do visible patterns **depend on the order of** **dimensions**?

2. Why is this **not** the case for a **scatterplot matrix**?

3. Can you come up with one **possible criterion** to choose the **best ordering** for parallel coordinates (I.e. if multiple orderings are available, which one should I choose)?

**Answer:**

**After completing your answers, export the docx-File to PDF and upload it alongside the source code files.**

**Submission: Zipped folder including all necessary files and a PDF of the completed written exercise.**

Please form a group of **2 Students**. Only 1 member of the group must submit the exercise in ILIAS. Please state the collaborators in the beginning of the document.