Exercise 1: Web Development Basics (20 points)

Due: 22.04.2024 10AM

The goal of this exercise is to familiarize yourself with the basic concepts of HTML, CSS, and JavaScript. By completing this assignment, you will gain hands-on experience editing HTML, CSS, and JavaScript files and understanding how they interact to create dynamic web content.

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

Instructions:

1. Download the attached folder named "Exercise01", which contains the necessary files for your first exercises in web development: an HTML file, a CSS file, and a JavaScript file.
2. Edit each of the files according to the tasks provided in the exercise.
3. Ensure that all changes you make are visible when opening the "index.html" file in your web browser.
4. Compile all the modified files into a zip file named "Exercise01_submission.zip" for submission.

Task 0: Setup (0 points)

Before starting with the exercises, ensure a proper development environment is set up. This includes having a code editor capable of handling different file types such as .html, .css, and .js. We recommend *Visual Studio Code* (short: *VS Code* - *https://code.visualstudio.com/)*. The only additional software you need is a web browser. You can use any browser you like; we recommend a Chrome-based browser (Chrome, Edge) or Firefox.

Task 1: HTML (5 points)

To get started, open the *index.html* both in your web browser (either by left-clicking or selecting "*Open with > Chrome/Firefox, etc.")* and the code editor. You should see some initial elements like div containers, text, or input fields.
Inspect the HTML file in your code editor. Changes you make in the HTML source file are displayed in your web browser when reloading the page (Shortcut: *F5*).

Task 1 a) - Modify the HTML so your team member names are shown as contributors. Answer the question "What is a div container in HTML?" in one to two sentences.

Task 1 b) – Below the first div container, add an image of a data visualization you have seen recently. Add a list underneath to indicate the data type(s), the data class(es), the overall message of the visualization, and where you took it.

Task 2: CSS **(4 points)**

We now introduce CSS (Cascading Style Sheets) to our HTML page. CSS allows us to easily modify the style (e.g., colors, font sizes, spacing, etc.) of our page.

Task 2 a) – Add a link in the header of the *index.html* to load the *index.css* stylesheet. You should get a visual confirmation on your webpage if the CSS has been loaded successfully.

Task 2 b) – Use the CSS stylesheet to center all text elements in the containing the header elements by

1. Adding an *identifier (id)* to the div container,
2. Select the id in the CSS file,
3. Add the correct CSS style rule to center text inside the div.

Task 3: SVG **(5 Points)**

So far, we are not yet able to create visualizations. The primary component we will use throughout the course is SVG (Scalable Vector Graphic). In such an SVG, we can specify shapes, lines, text, and more. An SVG contains many primitive shapes which we can compose into complex visualizations. To start, we will create some basic shapes on an SVG.

Task 3 a) Add an SVG element to the index.html file after the headings and list. Similarly to before, you can do this via an <*svg*>-tag. For the SVG, specify a height and width of 500.

Task 3 b) Now, you can add shapes to the <*svg*>-tag. Add five circles at different positions of the SVG with a radius of 4 and different fill colors.

You can find a list of all available SVG elements and how to draw them here: *https://developer.mozilla.org/en-US/docs/Web/SVG/Element*

Task 4: JavaScript **(6 points)**

We have now learned how to specify the layout and content of a page with HTML, CSS, and SVG. But so far, the website is static and does not allow for dynamic interactions. JavaScript enables this. Importantly, JavaScript builds the foundation for the d3 library, which we will use throughout this course.

To get started with JavaScript, we need to import it into our HTML file, similar to CSS. We will modify HTML via JavaScript in the next step.

Task 4 a) - Add a script tag in the header of your *index.html* to load the *index.js* file. If successful, you should print *"script.js loaded"* in the browser console.

Task 4 b) - Select all five circles in the SVG container. Extract their coordinates and add a square (width = 4) at the mean x- and y-position. To evaluate the coordinates of the square, print the mean x- and y-position to the console.

Submission: Zipped Exercise01 folder, including all files (index.html, index.js, index.css)