

## Web Technology Project (International Computer Science)

### Exercise sheet 4 — JavaScript

Deadline: 02 May 2025

In this exercise, you will create a simple web application that calculates the Body Mass Index (BMI) of a person. The BMI is calculated using the formula:

$$\text{BMI} = \frac{\text{weight}}{\text{height}^2}$$

where weight is in kilograms and height is in meters.

#### Exercise 4.1 (HTML and PicoCSS)

Create a new IntelliJ *module* `ex04` in your exercises repository. Create a new file `index.html` in the editor. The header must include the following details:

- A *viewport* with initial scale 1.
- A reference to the external PicoCSS *stylesheet*: `https://cdn.jsdelivr.net/npm/@picocss/pico@2.1.1/css/pico.css`
- A reference to a custom *stylesheet* `style/style.css` (which you will fill with contents in the next exercise).
- A reference to a custom *JavaScript* file `script/bmi.js` (which you will fill with contents in the next exercise).

Add the required elements to the body, such that the page initially renders as follows:

### Body Mass Index (BMI) Calculator

Body Height (cm):

Body Mass (kg):

170

70

Calculate BMI

#### Your Body Mass Index (BMI) is:

Please fill the form above to calculate the result.

Use the following coarse structure for the body:

```
1 <body>
2   <header> </header>
3   <main>
4     <article>
5       <div class="grid">
6         <div> ... </div>
7         <div> ... </div>
8       </div>
```

```

9         <div> class="grid"> ... </div>
10     </article>
11     <article>
12         <h3> ... </h3>
13         <p> ... </p>
14     </article>
15 </main>
16 </body>

```

Assume the following minimum, initial, and maximum values for the input fields:

- Body Height: 100, 170, 220
- Body Mass: 30, 70, 200

### Exercise 4.2 (JavaScript)

Triggered by a click on the button, the BMI application should replace the value of the bottom paragraph with the actual BMI calculated from the user inputs. For example:

## Body Mass Index (BMI) Calculator

Body Height (cm):

Body Mass (kg):

171

78

Calculate BMI

**Your Body Mass Index (BMI) is:**

27

Extend your JavaScript file `script/bmi.js` by the following declarations:

- A *function* `calculateBMI()` that takes the weight and height as parameters and returns the BMI according to the formula above. Use `Math.round()` to convert from `float` to `int`.
- Functions `getHeight()` and `getMass()` that return the values of the input fields for height and mass, respectively.
- An *event listener* for the button that calculates the bmi and calls the function `updateResult(bmi)` when clicked.
- The function `updateResult(bmi)` that is called when the button is clicked. It sets the text of the paragraph to the calculated BMI value. (Make sure you convert correctly between `number` and `string`.)
- Test the application with different inputs. Make sure that the BMI is calculated correctly and displayed in the bottom paragraph.

### Exercise 4.3 (Custom CSS)

The BMI application should change the color of the text in the bottom paragraph according to the BMI value.

- To calculate the color, define the following additional function:

```

1  function getBMIClass(bmi) {
2      if (bmi < 16) return "blue";
3      else if (bmi < 19) return "cyan";
4      else if (bmi < 25) return "green"
5      else if (bmi < 30) return "yellow";
6      else if (bmi < 35) return "orange";
7      else return "red";
8  }

```

- (b) Extend the style/style.css file to include one class per BMI color, where the background color equals the class name and the foreground color is either black or white (depending on the intensity of the background color).
- (c) Extend the callback updateResult so that the BMI class is determined and set as CSS class of the bottom paragraph.
- (d) Test the application with different input values, so that all CSS classes are used. Make sure the text is readable. For example:

## Body Mass Index (BMI) Calculator

Body Height (cm):

170

Body Mass (kg):

70

Calculate BMI

**Your Body Mass Index (BMI) is:**

24

## Body Mass Index (BMI) Calculator

Body Height (cm):

170

Body Mass (kg):

90

Calculate BMI

**Your Body Mass Index (BMI) is:**

31