

ISCG6420

Exercise: JavaScript Calculator

This exercise will explore applying JavaScript fundamental skills to an application.

This exercise can be performed independently or supported by group discussion.

Getting Started

Download the provided HTML, CSS, and JS file from Moodle. Open an existing website project or begin a new project in your IDE (VSCode, etc). Add the downloaded files to your project inside a folder called "week3". Double-click the HTML file in the week3 folder to open it.

With the Live Server (Five Server) extension enabled, click the "go live" button at the bottom-right of VSCode to launch a live version of the website. Your web browser should open a web page like this:



The webpage has some element created for you:

- nav bar at the top to return to your project home page
- Console log output redirect (displays the console log output on the webpage)
- Sample data for testing
- Basic calculator UI components

JavaScript

- 1) In VSCode, double-click the "add.js" file in the week3 folder to open the file. Inside you will find the following code:

```
//////// JavaScript Calculator exercise //////////  
  
// Add click event listeners to each of the calculator operation buttons,  
// and add a function to the events.  
  
// Save reference to the calculator input/output fields  
  
// Calculator operator functions. Each function will read the values from  
// the user input, convert the values to numbers, apply an operation to  
// the numbers, and store the output value in the result field.
```

Event listeners

- 2) Use DOM ID selectors to select each of the calculator operator buttons:

```
//////// JavaScript Calculator exercise //////////  
  
// Add click event listeners to each of the calculator operation buttons,  
// and add a function to the events.  
document.getElementById("btnAdd")  
document.getElementById("btnSubtract")  
document.getElementById("btnMultiply")  
document.getElementById("btnDivide")
```

- 3) For each selector line, append `addEventListener("click",);` to add a click event listener to each element:

```
document.getElementById("btnAdd").addEventListener("click", );  
document.getElementById("btnSubtract").addEventListener("click", );  
document.getElementById("btnMultiply").addEventListener("click", );  
document.getElementById("btnDivide").addEventListener("click", );
```

- 4) In the next section create 3 const variables for the two calculator input fields and the output field. Set their value to the respective element from the DOM:

```
// Save reference to the calculator input/output fields  
const calcField1 = document.getElementById("calcNum1");  
const calcField2 = document.getElementById("calcNum2");  
const calcResult = document.getElementById("calcResult");
```

5) In the next section create 4 functions – one for each calculator operation:

```
// Calculator operator functions. Each function will read the values from
// the user input, convert the values to numbers, apply an operation to
// the numbers, and store the output value in the result field.
function add() { ...
}

function subtract() { ...
}

function multiply() { ...
}

function divide() { ...
}
```

6) In each function, read the user input from the two input fields (calcField1, calcField2), apply the calculation operation (+, -, *, or /) and set the result to the calcResult field:

```
function add() {
    calcResult.innerHTML = calcField1.value + calcField2.value;
}
```

7) Link your functions to run on the click events by adding the function names as the second parameter to the `addEventListener("click", here);`

```
// Add click event listeners to each of the calculator operation buttons,
// and add a function to the events.
document.getElementById("btnAdd").addEventListener("click", add);
document.getElementById("btnSubtract").addEventListener("click", subtract);
document.getElementById("btnMultiply").addEventListener("click", multiply);
document.getElementById("btnDivide").addEventListener("click", divide);
```


8) Save your work and test the output:

| Number 1 | Operator | Number 2 | Result |
|--------------------------------|--|--------------------------------|--------|
| <input type="text" value="5"/> | <div>Add</div> <div>Subtract</div> <div>Multiply</div> <div>Divide</div> | <input type="text" value="2"/> | = 52 |

Something is wrong with the output. The numbers are being treated as strings instead of numbers, so they are concatenating instead of mathematical operating.

- 9) Fix the calculation error by converting the user input field data to numbers by wrapping the values in **Number()**:

```
function add() {  
    calcResult.innerHTML = Number(calcField1.value) + Number(calcField2.value);  
}
```



Save your work and test the output:

| Number 1 | Operator | Number 2 | Result |
|--------------------------------|--|--------------------------------|------------|
| <input type="text" value="5"/> | <div>Add</div> <div>Subtract</div> <div>Multiply</div> <div>Divide</div> | <input type="text" value="2"/> | = 7 |

Problem solved. Apply the same fix to all of the functions and test all calculator functionality.

Exercise complete.

Save your work and commit the changes to your repository.