

Web Application Development

LAB 5: Introduction to JavaScript

Main objectives

At the end of this activity, students should be able to:

- Link and execute JavaScript with HTML.
- Capture user input through prompt boxes, perform arithmetic operations, and format output strings using modern Template Literals.
- Use JavaScript to create interactive applications, process form inputs, and manage data

Exercise 1:

- 1) Explain the different ways to link JavaScript to an HTML document.
- 2) Apply the JavaScript code (in Fig2) to the HTML (in Fig1) using internal scripting.

Note

To verify that your JavaScript code is executing correctly:

- 1) Open your HTML file in any web browser.
- 2) Open the browser's developer tools by right-clicking anywhere on the page and selecting Inspect (F12).
- 3) Navigate to the Console tab within the developer tools window to view the results.

- 3) Apply the JavaScript code (in Fig2) to the HTML (in Fig1) using external scripting.
- 4) Modify the JavaScript code to ask the user for their last name, first name, and university using prompt boxes. Then display a personalized welcome message.

Example:

- | | |
|------------------------|-----------------------------|
| - Last Name: Bodiaf | - University: University of |
| - First Name: Mohammed | Msila |

Once the values are entered, the console should display:

"Welcome Mohammed Bodiaf from University of Msila !"

- 5) Modify the previous task to display the personalized welcome message using Template Literals (backticks `). Embed the variables directly into the string using the `${}` syntax.



```
<!DOCTYPE html>
<head>
  <meta charset="UTF-8">
  <title>JS Basics: Arithmetic Operations</title>
</head>
<body>
  <h1>JavaScript Lab: Variables and Numbers</h1>
  <p>Open the browser console (F12) to see the output of the operations.</p>
</body>
</html>
```

Fig1 : HTML code



```
console.log("Hello World!");
let a = Number(prompt("Enter the first number (a):"));
let b = Number(prompt("Enter the second number (b):"));

let sum = a + b;
let difference = a - b;
let product = a * b;
let quotient = a / b;
let modulus = a % b;

console.log("Sum: " + sum);
console.log("Difference: " + difference);
console.log("Product: " + product);
console.log("Quotient: " + quotient);
console.log("Modulus (Remainder): " + modulus);
```

Fig2 : JS code

Exercise 2:

- 1) Rewrite the HTML and JavaScript code in Fig3 and perform tests to verify the results.

```
<!DOCTYPE html>
<html>
<body>
<h2>Addition of Two Numbers</h2>
<input type="text" id="input_x" placeholder="Enter first number">
<input type="text" id="input_y" placeholder="Enter second number">
<button onclick="add()"> Add </button>
<p id="output"></p>
<script>
  function add() {
    let x = Number(document.getElementById('input_x').value);
    let y = Number(document.getElementById('input_y').value);
    let z = x + y;
    document.getElementById('output').innerHTML = "The sum is: " + z;
  }
</script>
</body>
</html>
```

Fig3 : HTML and JS code

- 2) Modify the **add()** function so that it calculates the sum of three integers instead of two.
- 3) Propose the **average()** function so that it calculates the average of the three integers (add a new button in HTML form).

Exercise 3:

- 1) Copy the code in Fig4:

```
<html>
<body>
  <h2>Factorial Calculator</h2>
  <input type="number" id="nInput" placeholder="Enter an integer">
  <button onclick="calculateFactorial()">Calculate Factorial</button>
  <p id="output"></p>
</body>
</html>
```

Fig4 : Exercise 3 HTML code

- 2) Add a **<script>** element to your file. Then define a function **calculateFactorial()** that:
 - Reads the value n from the input field.
 - Initializes a variable **fact=1**.
 - Uses a for loop to multiply the current total by every number from 1 up to n.
 - Displays the final result in the paragraph with id="output".

Exercise 4:

- 1) Add the following form (Fig5) to your page.

```
<form id="registrationForm">
  <input type="text" id="nameInput" placeholder="Full Name"><br>
  <input type="number" id="ageInput" placeholder="Age"><br>
  <input type="checkbox" id="remoteCheck"> Willing to work remotely<br>
  <select id="courseSelect">
    <option value="Web Dev">Web Development</option>
    <option value="Data Science">Data Science</option>
    <option value="Algorithm">Algorithm</option>
  </select><br>
  <button type="button" onclick="displaySummary()">Register</button>
</form>
<p id="result"></p>
```

Fig5 : HTML form

- 2) Write the **displaySummary()** function to:
 - Read the values from each input element.
 - Update the paragraph with id="result" to show the registration summary.

Exercise 5:

- 1) Create a new HTML file (library.html) to manage a list of book titles currently in a library inventory using an array.

```
<!DOCTYPE html>
<html>
<body>
  <h2>Library Inventory</h2>
  <input id="bookTitle" placeholder="Enter book title">
  <button onclick="addBook()">Add Book</button>
  <button onclick="clearLibrary()">Clear Inventory</button>
  <button onclick="countBooks()">Total Count</button>
  <p id="bookList"></p>
  <p id="totalCount"></p>
</body>
</html>
```

- 2) In <script> declare a global variable **let library = []**; Then write the code of these functions:
 - **addBook()**: Takes the value from the **bookTitle** input, adds it to the library array, and displays the full list in the **bookList** paragraph.
 - **clearLibrary()**: Resets the library array to [] and clears the **bookList** paragraph.
 - **countBooks()**: Displays the total number of books currently in the library array in the **totalCount** paragraph.