

## Web Application Development

### LAB 5: Introduction to JavaScript (solution)

#### Exercise 1:

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

```
<!DOCTYPE html>
<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>

  <script>
    // JS code from Fig2
    let a = Number(prompt("Enter the first number (a): "));
    let b = Number(prompt("Enter the second number (b): "));

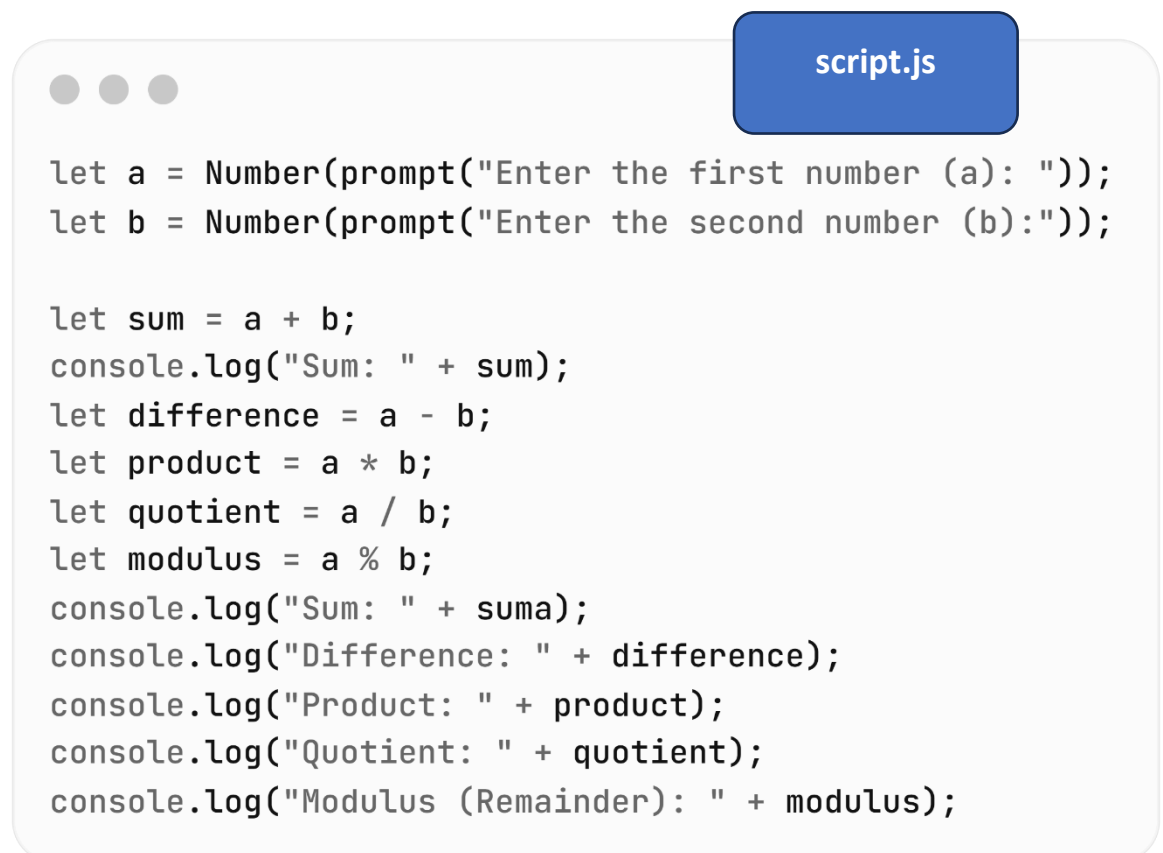
    let suma = a + b;
    let difference = a - b;
    let product = a * b;
    let quotient = a / b;
    let modulus = a % b;

    console.log("Sum: " + suma);
    console.log("Difference: " + difference);
    console.log("Product: " + product);
    console.log("Quotient: " + quotient);
    console.log("Modulus (Remainder): " + modulus);
  </script>
</body>
</html>
```

- 3) Apply the JavaScript code (in Fig2) to the HTML (in Fig1) using external scripting.

A code editor window titled "Main.html" with three window control buttons (red, yellow, green) in the top-left corner. The editor contains HTML code for a document titled "JS Basics: External".

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="UTF-8">
  <title>JS Basics: External</title>
</head>
<body>
  <h1>JavaScript Lab: Variables and Numbers</h1>
  <script src="script.js"></script>
</body>
</html>
```

A code editor window titled "script.js" with three window control buttons (red, yellow, green) in the top-left corner. The editor contains JavaScript code that prompts the user for two numbers and calculates their sum, difference, product, quotient, and modulus.

```
let a = Number(prompt("Enter the first number (a): "));
let b = Number(prompt("Enter the second number (b):"));

let sum = a + b;
console.log("Sum: " + sum);
let difference = a - b;
let product = a * b;
let quotient = a / b;
let modulus = a % b;
console.log("Sum: " + suma);
console.log("Difference: " + difference);
console.log("Product: " + product);
console.log("Quotient: " + quotient);
console.log("Modulus (Remainder): " + modulus);
```

- 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
- First Name: Mohammed
- University: University of Msila

Once the values are entered, the console should display:

**"Welcome Mohammed Bodiaf from University of Msila !"**

**Add this code :**

```
let lastName = prompt("Last Name:");
let firstName = prompt("First Name:");
let university = prompt("University:");

console.log("University: " + university);
console.log("Welcome " + firstName + " " + lastName + " from " + university + " !");
```

- 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.

```
let lastName = prompt("Last Name:");
let firstName = prompt("First Name:");
let university = prompt("University:");

console.log(`University: ${university}`);
console.log(`Welcome ${firstName} ${lastName} from ${university} !`);
```

## Exercise 2:

```
<!DOCTYPE html>
<html>
<body>
  <h2>Calculation: Sum and Average</h2>

  <input type="number" id="input_x" placeholder="Enter first number">
  <input type="number" id="input_y" placeholder="Enter second number">
  <input type="number" id="input_z" placeholder="Enter third number">
  <br><br>

  <button onclick="add()"> Calculate Sum </button>
  <button onclick="average()"> Calculate Average </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 = Number(document.getElementById('input_z').value);

      let sum = x + y + z;
      document.getElementById('output').innerHTML = "The sum is: " + sum;
    }

    function average() {
      let x = Number(document.getElementById('input_x').value);
      let y = Number(document.getElementById('input_y').value);
      let z = Number(document.getElementById('input_z').value);

      let avg = (x + y + z) / 3;

      document.getElementById('output').innerHTML = "The average is: " + avg;
    }
  </script>
</body>
</html>
```

## Exercise 3:

```

<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Exercise 3: Factorial</title>
</head>
<body>
  <h2>Factorial Calculator</h2>
  <input type="number" id="nInput" placeholder="Enter an integer">
  <button onclick="calculateFactorial()">Calculate Factorial</button>
  <p id="output"></p>
  <script>
    function calculateFactorial() {
      let n = Number(document.getElementById('nInput').value);
      let fact = 1;
      for (let i = 1; i <= n; i++) {
        fact = fact * i;
      }
      document.getElementById('output').innerHTML = "The factorial of "+n+"is: " + fact;}
  </script>
</body>
</html>

```

#### **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:

```
function displaySummary() {
    let name = document.getElementById('nameInput').value;
    let age = document.getElementById('ageInput').value;
    let isRemote = document.getElementById('remoteCheck').checked;
    let course = document.getElementById('courseSelect').value;

    let remoteStatus;
    if (isRemote) {remoteStatus = "Yes";}
    else {remoteStatus = "No";}

    document.getElementById('result').innerHTML =
        "<strong>Registration Summary:</strong><br>" +
        "Name: " + name + "<br>" +
        "Age: " + age + "<br>" +
        "Remote Work: " + remoteStatus + "<br>" +
        "Selected Course: " + course;
}
```

## Exercise 5:

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="UTF-8">
  <title>Library Inventory</title>
</head>
<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>
  <script>
    let library = [];
    function addBook() {
      let titleInput = document.getElementById('bookTitle');
      let title = titleInput.value;
      if (title !== "") {
        library.push(title);
        document.getElementById('bookList').innerHTML = "Books: " + library.join(",
");
        titleInput.value = "";
      }
    }
    function clearLibrary() {
      library = [];
      document.getElementById('bookList').innerHTML = "";
      document.getElementById('totalCount').innerHTML = "";
    }
    function countBooks() {
      document.getElementById('totalCount').innerHTML = "Total Count: " +
library.length;
    }
  </script>
</body>
</html>
```