

JavaScript Functions and Events

Module 3 - Functions with Loops in JavaScript



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A function is a group of reusable code which can be called anywhere in your program. This eliminates the need of writing the same code again and again. It helps programmers in writing modular codes.



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Loops in JavaScript are used to repeatedly execute a block of code as long as a specified condition is true. They are helpful for tasks like iterating over arrays or performing repetitive calculations.



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Functions and loops often work together to perform repetitive tasks more efficiently. For example, you can use a loop to call a function multiple times.

Solved Example 1: Square of numbers from 1 to 5



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Ques: Write a JavaScript program to calculate and display the square of numbers from 1 to 5 using a function and a for loop. Define a function named square that accepts a number as a parameter, calculates its square, and returns the result. Use a for loop to call the function for numbers 1 to 5 and display the results in the browser using document.write().



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Solution:



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```
<!DOCTYPE html>
<html>
<head>
  <title>Square Calculation</title>
</head>
<body bgcolor="#e6f7ff">
  <h2>Squares of Numbers from 1 to 5</h2>
  <script>
    // Function to calculate the square of a number
    function square(num) {
      return num * num;
    }

    // Loop through numbers from 1 to 5 and display their squares
    for (let i = 1; i <= 5; i++) {
      document.write("Square of " + i + " is " + square(i) + "<br>");
    }
  </script>
</body>
```



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</html>

OUTPUT:

Squares of Numbers from 1 to 5

Square of 1 is 1
Square of 2 is 4
Square of 3 is 9
Square of 4 is 16
Square of 5 is 25

Solved Example 2: Factorial of numbers from 1 to 5

Ques: Write a JavaScript program to calculate and display the factorials of numbers from 1 to 5 using a function and a for loop.

- Create a function named calculateFactorial that takes a number as input and returns its factorial.
- The factorial of a number is the product of all positive integers less than or equal to that number. For example:
 - Factorial of 3 (3!) = 3 × 2 × 1 = 6
 - Factorial of 5 (5!) = 5 × 4 × 3 × 2 × 1 = 120
- Use a loop to call this function for numbers 1 to 5 and display the factorial results in the browser using document.write().

Solution:

```
<!DOCTYPE html>
<html>
<head>
<title>Factorial Calculation using Function and Loop</title>
<script>
// Function to calculate factorial of a number
function calculateFactorial(num) {
let factorial = 1; // Initialize factorial as 1
for (let i = 1; i <= num; i++) {
factorial *= i; // Multiply factorial by the current number
}
return factorial; // Return the calculated factorial
}
}
```

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```
// Using a loop to calculate factorials of numbers from 1 to 5
document.write("<h3>Factorials of Numbers from 1 to 5:</h3>");
for (let i = 1; i <= 5; i++) {
    let result = calculateFactorial(i); // Call the function
    document.write("Factorial of " + i + " is: " + result + "<br>");
}
</script>
</head>
<body bgcolor="#f0f8ff">
</body>
</html>
```

Explanation of the above program where <body> tag is placed after <script> tag

1. Placing the <body> tag at the bottom of the HTML file (after <script> or other elements) can sometimes serve practical purposes in web development.
2. Improves Page Load Performance.
3. By placing the <body> tag (or scripts) at the end of the document, you ensure that all HTML elements are fully loaded and parsed before the script runs.

OUTPUT:

Factorials of Numbers from 1 to 5:

Factorial of 1 is: 1
Factorial of 2 is: 2
Factorial of 3 is: 6
Factorial of 4 is: 24
Factorial of 5 is: 120

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Assignment

1. Calculate the Sum of Natural Numbers

Ques: Write a JavaScript program to calculate the sum of the first n natural numbers. The user will input the value of n using a prompt box. Display the result using document.write.

2. Generate Multiplication Table

Ques: Write a JavaScript program that asks the user to input a number and then generates the multiplication table for that number using a loop and a function. Display the table using document.write.

3. Calculate the Power of a Number

Ques: Write a JavaScript program that prompts the user to input a base number and an exponent. Use a function and a loop to calculate the power (e.g., $\text{base}^{\text{exponent}}$). Display the result using document.write.

4. Sum of Numbers in a Range

Ques: Create a function calculateSum(start, end) that calculates the sum of all numbers between start and end (inclusive). Use a for loop inside the function to iterate through the range. Prompt the user to enter the starting and ending values of the range. Call the function and display the result using document.write.



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