

JavaScript Functions and Events

Module 1 - Function 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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Why we need JavaScript Functions?

When we write a program, we often required to perform the same action in many places. For example, we want to display a message to the users when they complete an action.

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To avoid repeating the same code all over places, we can use a function to wrap that code and reuse it. JavaScript provides many built-in functions such as alert() and console.log()

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If we have a few lines of code that need to be used multiple times, we can create a function that contains the repeating lines of code and then call the function wherever we want.

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Functions allow a programmer to divide a big program into a number of small and manageable functions.

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Like any other advanced programming language, JavaScript also supports all the features necessary to write modular code using functions. You must have seen functions like alert() and write() in the earlier chapters. We were using these functions again and again, but they had been written in core JavaScript only once. JavaScript allows us to write our own functions as well.

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This section explains how to write your own functions in JavaScript.

JavaScript Function Syntax:

```
function functionName(param1, param2, ...paramN) {  
    //code to be executed  
    return anyValue;//return is used if function return any value otherwise not  
}
```

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How to Create a Function in JavaScript

In JavaScript, functions can be created inside the JavaScript script tag only. The function is a reserved keyword of JavaScript. Use the keyword function with the name of the function

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After the function name, open and close parentheses (). After parenthesis, open and close curly braces {}. Within curly braces, write your lines of code from where the function starts and where ends are kept inside in curly braces.



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Types of Functions in JavaScript: User-defined and Built-in Functions

In JavaScript, functions can be broadly categorized into User-defined Functions and Built-in Functions based on how they are created and used.



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1. User-defined Functions

These are functions created by the user to perform specific tasks. They allow you to encapsulate a block of reusable code.

Syntax:

```
function functionName(parameters) {  
    // Code to execute  
}
```



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2. Built-in Functions

These are predefined functions provided by JavaScript to perform common tasks like string manipulation, mathematical operations, or date handling.

Examples of Built-in Functions:

- alert(): Displays a popup box with a message.
- prompt(): Asks the user for input.
- parseInt(): Converts a string to an integer.
- Math.random(): Generates a random number between 0 and 1.

Function Parameters:

A function accepts zero, one, or multiple parameters. If there are multiple parameters, we need to separate them by commas (,).

Case 1: No Parameter

The following declares a function named show() that accepts no parameter:

```
function show() {  
    //...  
}
```

Case 2: Single Parameter

The following declares a function named square() that accepts one parameter:



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```
function square(x) {
  //...
}
```

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Case 3: Two Parameters

And the following declares a function named add() that accepts two parameters:

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```
function add(a,b) {
  //...
}
```

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NOTE: To pass information to a function, we can use parameters

- Parameters accept input data in the function.
- Each parameter has a name.
- We can pass zero or several input values.
- Parameters are assigned to particular values (called “arguments“) when the function is called Parameters can change the function behavior depending on the passed values.
- The function’s behavior depends on its parameters. Parameters can be of any type number, string, object, array, etc, and even the function.

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Solved Example 1: Print “Hello” using Functions

Ques: Write a JavaScript program that automatically displays an alert box with the message "Hello there" when the webpage is loaded.

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Define a function named sayHello in JavaScript that uses the alert() method to show the message.

Ensure that the function is executed automatically when the page loads.

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Solution:

```
<!DOCTYPE html>
<html>
<head>
  <title>Automatic Alert Example</title>
  <script type="text/javascript">
    <!--
    // Function definition
    function sayHello() {
      alert("Hello there");
    }
  </script>
</head>
</html>
```

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```
// Call the function automatically
sayHello();
//-->
</script>
</head>
<body bgcolor="#f0e68c">
  <h3>Welcome to the page! The alert box should have appeared
  automatically.</h3>
</body>
</html>
```

Explanation:

Function Definition:

- The sayHello function is defined using the function keyword.
- It uses the alert() method to display the message "Hello there" in an alert box.

Automatic Execution:

- The function is called immediately after its definition using sayHello();.
- This ensures that the alert box is displayed as soon as the page is loaded.

HTML Integration:

- The <script> tag includes the JavaScript code in the HTML file.
- No user interaction (like a button click) is required to trigger the function.

Background Color:

- The <body> tag sets the background color to #f0e68c (light khaki)

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OUTPUT



Output:

When the webpage is loaded:
An alert box appears with the message:
Hello there

After dismissing the alert, the webpage displays the text:
Welcome to the page! The alert box should have appeared automatically.

Solved Example 2: Calculate Sum of Two Numbers without Prompt Box

Ques: Write a JavaScript program to define a user-defined function that calculates the sum of two numbers.

- Create an HTML document with the following specifications:
- Title the document: "User-defined Function Example."
- Define a JavaScript function named calculateSum that takes two parameters (a and b).
- The function should return the sum of a and b.
- Call the function with the values 5 and 10 as arguments.
- Display the result using document.write().
- Add a light blue background color to the webpage (#f0f8ff).
- Include a paragraph explaining that the program demonstrates a user-defined function for calculating the sum of two numbers.

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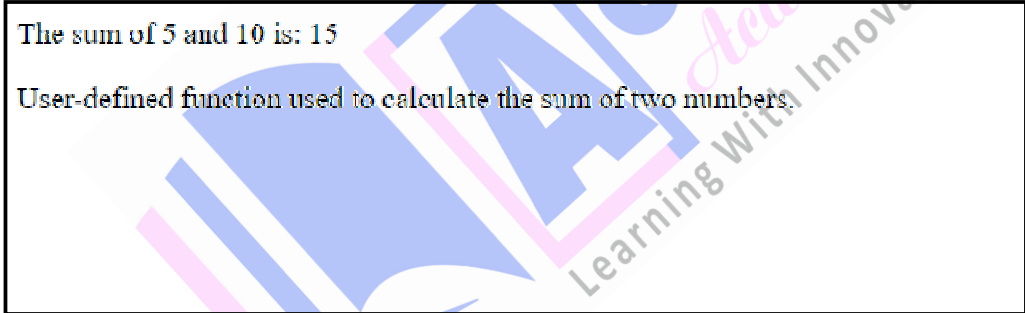
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Solution:

```
<!DOCTYPE html>
<html>
<head>
  <title>User-defined Function Example</title>
  <script>
    // Defining a user-defined function
    function calculateSum(a, b) {
      return a + b; // Returns the sum of a and b
    }

    // Calling the function and displaying the result
    let result = calculateSum(5, 10);
    document.write("The sum of 5 and 10 is: " + result);
  </script>
</head>
<body bgcolor="#f0f8ff">
  <p>User-defined function used to calculate the sum of two numbers.</p>
</body>
</html>
```

OUTPUT:



Solved Example 3: Calculate Sum of Three Numbers using Prompt Box

Ques: Write a JavaScript program to calculate the sum of three numbers entered by the user using prompt boxes and a user-defined function.

- Define a function to calculate the sum of three numbers.
- Use prompt boxes to accept three inputs from the user.
- Call the function with these inputs and display the result on the webpage using document.write().
- Add a background color light peach (#ffefd5) to the webpage.

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Solution:

```
<!DOCTYPE html>
<html>
<head>
  <title>Sum of Three Numbers Using Function</title>
</head>
<body bgcolor="#ffefd5">
  <script>
    // Define a user-defined function to calculate the sum
    function calculateSum(num1, num2, num3) {
      return num1 + num2 + num3;
    }

    // Prompt the user to enter three numbers
    let number1 = parseFloat(prompt("Enter the first number:"));
    let number2 = parseFloat(prompt("Enter the second number:"));
    let number3 = parseFloat(prompt("Enter the third number:"));

    // Call the function to calculate the sum
    let result = calculateSum(number1, number2, number3);

    // Display the result on the webpage
    document.write("<h3>The sum of the three numbers is: " + result + "</h3>");
  </script>
</body>
</html>
```

Assignment

Ques 1: Write a program to check if a number is even or odd.

Instructions:

- Define a function **isEven** that takes a number as a parameter.
- The function should return true if the number is even and false if the number is odd.
- Prompt the user to enter a number.
- Call the function and display the result (even or odd) using document.write.

Ques: Write a program to convert Celsius to Fahrenheit using a function.

Instructions:

- Define a function **convertToFahrenheit** that takes a temperature in Celsius as a parameter.
- Prompt the user to enter the temperature in Celsius.
- Call the function to calculate the temperature in Fahrenheit using the formula:



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- Fahrenheit = Celsius X 9/5 + 32
- Display the result using document.write.

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