

Introduction to JavaScript

A yellow square containing the letters 'JS' in a bold, black, sans-serif font.

OBJECTIVE

The objective of this session [Part 1] is to provide a fundamental understanding of embedding JavaScript within web pages learn about JavaScript data types, variables, conditional statements, and loops.



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What Is JavaScript?

JavaScript is a **high-level, interpreted programming language** primarily used to create interactive web pages. It is an essential part of web development, working alongside HTML (structure) and CSS (styling).



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Features of JavaScript

- Client-side scripting language (runs in web browsers).
- Dynamically typed (no need to specify variable types explicitly).
- Supports event-driven programming (e.g., button clicks, form submissions).
- Can manipulate HTML and CSS dynamically (DOM manipulation).



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<script> Tag in JavaScript

JavaScript is added to an HTML document using the <script> tag. It can be written in two ways:

1. **Internal JavaScript (within the HTML file)**
2. **External JavaScript (linked via an external .js file)**



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Internal JavaScript

```
<!DOCTYPE html>
<html>
<head>
  <title>JavaScript Example</title>
</head>
<body>
  <h2>Click the button to see JavaScript in action</h2>
  <button onclick="showMessage()">Click Me</button>

  <script>
    function showMessage() {
      alert("Hello! This is JavaScript.");
    }
  </script>
</body>
</html>
```



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External JavaScript

HTML file

```
<!DOCTYPE html>
<html>
<head>
  <title>JavaScript Example</title>

  <script src="script.js"></script>
</head>
<body>
  <h2>Click the button to see JavaScript in action</h2>
  <button onclick="showMessage()">Click Me</button>
</body>
</html>
```

script.js file

```
function showMessage() {
  alert("Hello from an external JavaScript file!");
}
```



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Variables in JavaScript

Declaring Variables

JavaScript provides three keywords to declare variables:

- - var (old way, function-scoped)
- - let (modern, block-scoped)
- - const (constant, cannot be reassigned)

Example: Variable Declaration

```
var name = "Alice"; // String
let age = 25;       // Number
const PI = 3.14;    // Constant

console.log(name, age, PI);
```



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Data Types in JavaScript

JavaScript has two main types:

1. Primitive Data Types

- - String (e.g., "Hello")
- - Number (e.g., 10, 3.14)
- - Boolean (true/false)
- - Undefined (variable declared but not assigned)
- - Null (intentional empty value)

2. Non-Primitive Data Types

- - Array (e.g., [1, 2, 3])
- - Object (e.g., {name: "Alice", age: 25})



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Example of Data Types

```
let str = "JavaScript";    // String
let num = 100;             // Number
let isJavaScriptFun = true; // Boolean
let notDefined;           // Undefined
let emptyValue = null;    // Null

let arr = [10, 20, 30];   // Array []
let person = {name: "Alice", age: 25}; // Object

console.log(typeof str, typeof num, typeof
isJavaScriptFun);
```



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if-else Conditional Statements

Conditional statements help execute different blocks of code based on conditions.

Syntax

```
if (condition) {  
    // Code executes if condition is true  
} else {  
    // Code executes if condition is false  
}
```



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Example of if-else Statements

Program to Check Even or Odd Number

```
//Write this code inside the <script> tag in html file.
```

```
let number = 10;
```

```
if (number % 2 === 0) {  
    console.log(number + " is Even");  
} else {  
    console.log(number + " is Odd");  
}
```



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Example of if-else Statements

Program of Grading System

//Write this code inside the <script> tag in html file.

```
let marks = 85;

if (marks >= 90) {
    console.log("Grade: A");
} else if (marks >= 80) {
    console.log("Grade: B");
} else if (marks >= 70) {
    console.log("Grade: C");
} else {
    console.log("Grade: F");
}
```



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Loops in JavaScript

Loops are used to execute a block of code multiple times.

Types of Loops:

1. **for loop** – Runs for a fixed number of times.
2. **while loop** – Runs as long as a condition is true.
3. **do-while loop** – Runs at least once, then checks the condition.
4. **for...in loop** – Iterates over object properties.
5. **for...of loop** – Iterates over array values.



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Loops in JavaScript

Example: for Loop (Print Numbers 1 to 5)

```
for (let i = 1; i <= 5; i++) {  
    console.log(i);  
}
```

Example: while Loop (Print Numbers 1 to 5)

```
let i = 1;  
while (i <= 5) {  
    console.log(i);  
    i++;  
}
```



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Loops in JavaScript

Example: do-while Loop

```
let x = 1;  
do {  
  console.log(x);  
  x++;  
} while (x <= 5);
```

Example: for...in Loop (Iterating over an Object)

```
let student = {name: "Alice", age: 20, grade: "A"};  
  
for (let key in student) {  
  console.log(key + ": " + student[key]);  
}
```



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Loops in JavaScript

Example: for...of Loop (Iterating over an Array)

```
let colors = ["Red", "Green", "Blue"];

for (let color of colors) {
  console.log(color);
}
```



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