

Day 1: Introduction to JavaScript

1. What is JavaScript?

JavaScript is a **high-level, interpreted programming language** that enables interactive web pages.

Where is JavaScript Used?

- **Front-end Development:** Adds interactivity and dynamic content to web pages (e.g., animations, form validation).
- **Back-end Development:** With **Node.js**, JavaScript can be used to build server-side applications.
- **Mobile App Development:** Frameworks like React Native enable mobile development using JavaScript.

Relationship with HTML and CSS

- **HTML (HyperText Markup Language):** Defines the structure of a webpage.
- **CSS (Cascading Style Sheets):** Styles the webpage (color, layout, font).
- **JavaScript:** Adds interactivity (click events, animations, form validations).

2. Basic Syntax of JavaScript

Variables

Variables store values and can be declared using:

```
var name = "John"; // Global scope (not recommended)
```

```
let age = 25;      // Block scope (preferred)
```

```
const PI = 3.14;   // Constant value, cannot be reassigned
```

Data Types

JavaScript has six primitive data types and one reference data type:

```
let num = 10;      // Number
```

```
let str = "Hello"; // String
```

```
let isTrue = true; // Boolean
```

```
let arr = [1, 2, 3]; // Array  
let obj = { name: "Alice", age: 30 }; // Object  
let x = null;      // Null  
let y;             // Undefined
```

Operators

1. **Arithmetic Operators:** +, -, *, /, %, ++, --
2. **Assignment Operators:** =, +=, -=, *=, /=
3. **Comparison Operators:** ==, ===, !=, !==, >, <, >=, <=
4. **Logical Operators:** &&, ||, !

Example:

```
let a = 10, b = 20;  
console.log(a + b); // Output: 30  
console.log(a > b); // Output: false
```

3. Control Flow Statements

if-else Statement

```
let score = 85;  
if (score >= 90) {  
    console.log("Grade A");  
} else if (score >= 80) {  
    console.log("Grade B");  
} else {  
    console.log("Grade C");  
}
```

switch Statement

```
let day = "Monday";  
switch (day) {  
  case "Monday":  
    console.log("Start of the week!");  
    break;  
  case "Friday":  
    console.log("Weekend is near!");  
    break;  
  default:  
    console.log("Another day!");  
}
```

Loops

for Loop

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

while Loop

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

do...while Loop

```
let j = 1;  
do {  
  console.log(j);
```

```
j++;  
} while (j <= 5);
```

4. Console Output

The `console.log()` method is used for debugging and displaying output in the console.

```
console.log("Hello, World!");
```

```
console.log(5 + 3);
```
