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## **Introduction to JavaScript & How JS Runs in the Browser**

### **Objective**

To gain foundational knowledge about JavaScript:

- What JavaScript is
- Where and how it is used in web development
- How JavaScript code runs inside the browser

### **What is JavaScript?**

JavaScript is a **client-side scripting language** that enables dynamic interactions on web pages. It allows developers to make websites:

- **Interactive** (e.g., forms, image sliders, live updates)
- **Responsive** (adjust content based on user actions)
- **Functional** (connect to APIs, validate input, etc.)

Originally developed by **Brendan Eich** in 1995, JavaScript is now one of the **core technologies of the web**, along with HTML and CSS.

## Key Characteristics of JavaScript

- **Lightweight** and interpreted
- **Dynamically typed**
- Supports **OOP (Object-Oriented Programming)** and **Functional Programming**
- Executed in **web browsers**
- Can be used on **both client-side** and **server-side (Node.js)**

## How JavaScript Runs in the Browser

When a user visits a webpage, here's how JavaScript works:

### Step-by-Step Flow:

1. **HTML is parsed** by the browser.
2. **CSS is applied** to elements.
3. JavaScript is executed by the **JavaScript engine** (like V8 in Chrome, SpiderMonkey in Firefox).
4. The browser provides a **runtime environment**, including:
  - **DOM (Document Object Model)** – access and modify HTML
  - **BOM (Browser Object Model)** – handle window, alerts, navigation
  - **Web APIs** – timers, fetch API, storage

### Example: Simple Script in HTML

```
<!DOCTYPE html>
<html>
<head>
  <title>My First JS</title>
</head>
<body>
  <h1>Hello JavaScript!</h1>
```

```
<script>
  alert("Welcome to JavaScript!");
  console.log("JavaScript is running in the browser!");
</script>
</body>
</html>
```

## Console Output & Developer Tools

- Most browsers offer **Developer Tools** (F12 or right-click → Inspect)
- Go to the **Console tab** to view errors, logs, and run JS interactively

## Conclusion

Today I understood that JavaScript is a **dynamic and essential language** in the web development stack. It works **seamlessly with HTML and CSS** to build interactive, modern websites. Learning how it executes in the browser gave me clarity on where code runs and how browsers interpret it.