

Chapter-01 – JavaScript (Introduction)

What is JavaScript?

JavaScript is a **lightweight**, **prototype-based**, **multi-paradigm**, **single-threaded**, **dynamically typed** and **interpreted programming language** used to give instructions to the computer.

In simple words, JavaScript tells the browser or server **what to do and how to do it**.

Key Characteristics of JavaScript

- **Lightweight** – Easy to learn and fast
- **Prototype-based** – Uses prototypes instead of classical inheritance
- **Multi-paradigm** – Supports procedural, OOP, and functional programming
- **Single-threaded** – Executes one task at a time
- **Dynamically typed** – No need to declare data types
- **Interpreted** – Executes line by line

JavaScript Execution Environment

JavaScript in Browser Environment

In browsers, JavaScript is executed by built-in JavaScript engines.

- **V8 Engine** – Google Chrome
- **SpiderMonkey** – Mozilla Firefox
- **JavaScriptCore** – Apple Safari

These engines convert JavaScript code into machine code so that the browser can execute it.

JavaScript in Node.js Environment

In Node.js, JavaScript is also executed by the **V8 Engine** (same engine used by Google Chrome).

Node.js adds extra modules on top of V8, such as:

- **fs** – File system

- http – Create servers
- os – Operating system info

Because of Node.js, JavaScript can be used **outside the browser** to build servers and tools.

What JavaScript Can Do in Frontend

- **Manipulate HTML & CSS** – Change text, styles, and elements dynamically
- **Handle Events** – Clicks, typing, scrolling, mouse actions
- **Form Validation** – Validate user input before submitting
- **Communicate with Servers** – Using AJAX or Fetch API
- **Build Web Applications** – Gmail, YouTube, Instagram

Who Created JavaScript and When?

JavaScript was created in **1995** by **Brendan Eich**.

Brendan Eich is an American computer programmer, co-founder of the **Mozilla Project** and **Brave Software**.

JavaScript was created at **Netscape** to make web pages dynamic and interactive.

Is Java and JavaScript the Same?

 No, Java and JavaScript are completely different languages.

Fun Fact

Despite the name, JavaScript has **nothing to do with Java**.

- JavaScript was named for **marketing purposes**
- Java was very popular at that time
- The name helped JavaScript gain attention

Short Exam Definition

JavaScript is a lightweight, interpreted, dynamically typed programming language used to

create dynamic and interactive web applications.

Summary

- JavaScript works in browser and server (Node.js)
- Uses engines like V8 and SpiderMonkey
- Not related to Java
- Core technology of modern web development

Hello World!