

## **Q1. What is JavaScript? Explain the role of JavaScript in web development.**

**Ans:** JavaScript is a widely-used programming language that is essential for modern web development. While it is most well-known as the scripting language for Web pages It is a high-level, dynamic, and interpreted language that allows developers to add interactivity and dynamic content to web pages. It's a client-side language, which means it runs in the web browser, rather than on the server.

### **Role of JavaScript in Web Development**

1. **Adds Interactivity**  
JavaScript allows users to interact with web pages through features like buttons, forms, sliders, pop-ups, and dropdown menus.
2. **Dynamic Content Updates**  
It can change HTML content and CSS styles without reloading the page (for example: updating text, images, or data instantly).
3. **Form Validation**  
JavaScript checks user input in forms (like email, password, or required fields) before sending data to the server, improving user experience.
4. **Event Handling**  
It responds to user actions such as clicks, keyboard input, mouse movement, and page loading.
5. **Client-Side Processing**  
JavaScript performs tasks in the browser, reducing server load and making websites faster.
6. **Supports Modern Web Applications**  
JavaScript is used in frameworks and libraries like React, Angular, and Vue, helping developers build single-page applications (SPAs).

## **Q2. How is JavaScript different from other programming languages like Python or Java?**

**Ans:** JavaScript is different from other programming languages like Python or Java in several important ways. The key differences like.

### **1. Purpose and Usage**

- JavaScript is mainly used for web development, especially to make web pages interactive and dynamic.

- Python is commonly used for data science, machine learning, automation, and backend development.
- Java is widely used for enterprise applications, Android apps, and large-scale systems.

## 2. Execution Environment

- JavaScript runs primarily in the web browser (client-side), though it can also run on servers using Node.js.
- Python and Java mainly run on the server or local machine, not directly in the browser.

## 3. Typing System

- JavaScript is a dynamically typed language, meaning variable types are determined at runtime.
- Python is also dynamically typed.
- Java is a statically typed language, where variable types must be declared in advance.

## 4. Syntax and Structure

- JavaScript has a flexible syntax and supports both functional and object-oriented programming.
- Python focuses on readability and simplicity with minimal syntax.
- Java uses a more strict and verbose syntax, following strong object-oriented principles.

## 5. Compilation and Execution

- JavaScript is interpreted by the browser.
- Python is also interpreted.
- Java is compiled into bytecode and then executed on the Java Virtual Machine (JVM).

### **Q3. Discuss the use of <script> tag in HTML. How can you link an external JavaScript file to an HTML document?**

**Ans:** The <script> tag in HTML is used to embed or link JavaScript code into a web page. It tells the browser to execute JavaScript, which helps make the webpage interactive and dynamic.

Linking an External JavaScript File to HTML

To link an external JavaScript file, use the src attribute of the <script> tag.

Example:

```
<!DOCTYPE html>

<html>

<head>

    <title>External JavaScript</title>

</head>

<body>

    <h1>Hello World</h1>

    <script src="script.js"></script>

</body>

</html>
```