**JavaScript Assignment**

* **JavaScript Introduction:**

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

**Ans) JavaScript** is a scripting language used to create interactive and dynamic content on websites.

Role in Web Development:  
JavaScript enables user interaction (like clicks, form submissions), updates content without reloading the page, and works with HTML/CSS to build modern, responsive web apps.

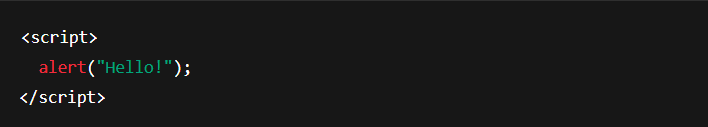
1. **How is JavaScript different from other programming languages like Python or Java?**

**Ans)** JavaScript runs mainly in web browsers for interactive web pages, while Python and Java are general-purpose languages often used for backend development, data science, or mobile apps. JavaScript is event-driven and loosely typed, whereas Python is known for readability and Java for strict object-oriented structure.

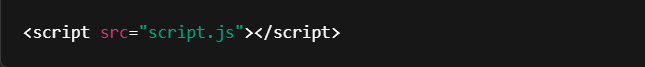
1. **Discuss the use of <script> tag in HTML. How can you link an external JavaScript file to an HTML document?**

**Ans)** The <script> tag in HTML is used to embed or reference JavaScript code in a web page.

To write JavaScript inside HTML:

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To link an external JavaScript file:

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Place the <script> tag before the closing </body> tag for better performance.

* **Variables and Data Types:**

1. **What are variables in JavaScript? How do you declare a variable using var, let, and const?**

**Ans)** Variables in JavaScript store data values that can be used and changed during program execution.

Declaration methods:

* var – old way, function-scoped

var name = "John";

* let – modern way, block-scoped

let age = 25;

* const – block-scoped, value can't be reassigned

const PI = 3.14;

Use let and const for cleaner, more predictable code.

1. **Explain the different data types in JavaScript. Provide examples for each.**

**Ans)** JavaScript has 8 main data types, divided into primitive and non-primitive:

🔹 Primitive Data Types:

1. String – Text data

let name = "Alice";

1. Number – Numeric values

let age = 30;

1. Boolean – True or false

let is Online = true;

1. Undefined – Variable declared but not assigned

let x;

1. Null – Intentional absence of any value

let y = null;

1. BigInt – For very large integers

let bigNum = 12345678901234567890n;

1. Symbol – Unique and immutable value

let id = Symbol("id");

🔹 Non-Primitive Data Type:

1. Object – Collection of key-value pairs

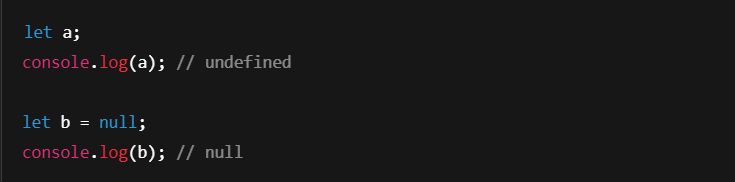
let person = { name: "Alice", age: 30 };

These types help JavaScript handle various kinds of data in programs.

1. **What is the difference between undefined and null in JavaScript?**

**Ans)** undefined means a variable has been declared but hasn't been assigned a value.  
null is an assigned value that represents "no value" or "nothing."

🔸 Example:

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Key Difference:

* undefined is set by JavaScript by default.
* null is set by the developer intentionally.