

Introduction to JavaScript Programming

Module 3 - The Script Tag

How to Add JavaScript in HTML Document?

To add JavaScript in HTML document, several methods can be used. These methods include embedding JavaScript directly within the HTML file or linking an external JavaScript file.

The HTML `<script>` tag embeds client-side scripts or links to external JavaScript files, enabling dynamic content, form validation, and style manipulation. Attributes like `async`, `defer`, and `src` control script execution and loading, enhancing the interactivity and performance of web pages.

Syntax

// For Internal JavaScript Linking

```
<script> Script Contents... </script>
```

// For External JavaScript Linking

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

What defer does?

- The browser downloads the JavaScript file while the HTML is still loading.
- The JavaScript runs only after the whole HTML page is ready.

Why use defer?

- It makes the page load faster.
- It's helpful when using simple editors like **Notepad**, because you can put the script in the `<head>` part and it will still work correctly.

Internal JavaScript (Within `<script>` Tag)

You can write JavaScript code inside the `<script>` tag within the HTML file. This is known as internal JavaScript and is commonly placed inside the `<head>` or `<body>` section of the HTML document.

1. JavaScript Code Inside `<head>` Tag

Placing JavaScript within the `<head>` section of an HTML document ensures that the script is loaded and executed as the page loads. This is useful for scripts that need to be initialized before the page content is rendered.

2. JavaScript Code Inside `<body>` Tag



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JavaScript can also be placed inside the <body> section of an HTML page. Typically, scripts placed at the end of the <body> load after the content, which can be useful if your script depends on the DOM being fully loaded.

Attributes of <script>

Attribute	Description	Example
src	Specifies the URL of an external JavaScript file.	<script src="app.js"></script>
type	Specifies the MIME type of the script. Default is text/javascript.	<script type="module"></script>
async	Allows the script to load asynchronously, without blocking the HTML parsing.	<script async src="app.js"></script>
defer	Defers script execution until after the HTML document is completely parsed.	<script defer src="app.js"></script>
crossorigin	Specifies how the script is fetched, for CORS-enabled files.	<script crossorigin="anonymous"></script>
nomodule	Prevents the script from being executed in browsers that support JavaScript modules.	<script nomodule src="legacy.js"></script>

Solved Example: Inline JavaScript

```
<!DOCTYPE html>
<html>
<head>
  <title>Inline JavaScript</title>
</head>
<body>
  <h1 id="greeting">Hello, World!</h1>
  <script>
    document.getElementById("greeting").innerHTML = "Hello, JavaScript!";
  </script>
</body>
</html>
```

Output in the Browser:

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Hello, JavaScript!

**Explanation:**

- The HTML contains an <h1> tag with the text "Hello, World!".
- The <script> tag contains JavaScript that finds the <h1> element by its id (greeting) and changes its innerHTML to "Hello, JavaScript!".
- This JavaScript runs after the HTML is parsed, so the content of the <h1> is replaced.

**Explanation of the JavaScript Line:**

`document.getElementById("greeting").innerHTML = "Hello, JavaScript!";`

1. document

- document is a global object in JavaScript that represents the entire HTML document.
- It gives access to the DOM (Document Object Model) of the page, which is a hierarchical representation of the page's structure.

2. getElementById("greeting")

- getElementById("greeting") is a method that retrieves an HTML element by its id attribute.
- "greeting" is the id value of the element you want to target.
- This method returns the first element in the document with the id of "greeting".

3. innerHTML

- innerHTML is a property of an HTML element.
- It represents the HTML content inside an element as a string.
- By setting innerHTML, you can change the content inside the targeted element. In this case, you're changing the content inside the <h1> element with id="greeting".

4. "Hello, JavaScript!"

- This is the string that is being assigned to the innerHTML property of the selected element.
- It will replace the current content inside the <h1> element with "Hello, JavaScript!".

Solved Example: External JavaScript

```
<!DOCTYPE html>  
<html>
```

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```
<head>
  <title>External JavaScript</title>
  <script src="script.js defer"></script>
</head>
<body>
  <h1 id="greeting">Hello, World!</h1>
</body>
</html>
```

**External JavaScript (script.js) Code:**

```
document.getElementById("greeting").innerHTML = "Hello, External JavaScript!";
```

**Output in the Browser:**

Hello, External JavaScript!

**Explanation:**

- The <script> tag in the <head> section links to an external JavaScript file, script.js.
- This JavaScript file changes the content of the <h1> element with id="greeting" from "Hello, World!" to "Hello, External JavaScript!".
- Since the <script> is included in the <head>, it will execute before the body content is rendered unless you use the defer attribute.

**Assignment**

Ques 1: Write a JavaScript program to display the paragraph given below inside an element with the **ID greeting**.

**Greeting Paragraph:**

"Hello and welcome! We are delighted to have you here. This is a space where you can explore, learn, and grow. Whether you're here to discover something new, reconnect with old ideas, or simply relax, we hope you find what you're looking for. Have a wonderful day ahead!"

Ques 2: Write a JavaScript program to display a paragraph on computers inside an element with the **ID Computer**.

**Paragraph on Computers:**

"A computer is an electronic device that can perform a wide variety of tasks quickly and efficiently. It processes data according to instructions provided by software programs, making it a versatile tool for individuals and businesses alike."



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Computers are used in numerous fields, including education, healthcare, entertainment, and scientific research. They have revolutionized communication and information sharing through the internet, enabling people to connect and collaborate worldwide. With advancements in technology, computers have become more compact, faster, and smarter, playing an integral role in shaping modern life."

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