DOM

1. Introduction to the DOM

Before diving into the Document Object Model (DOM), it's important to understand how web pages work. A website is made up of three key technologies:

HTML (HyperText Markup Language) →
Defines the structure of the webpage.

CSS (Cascading Style Sheets) →
Styles and visually enhances the webpage.

JavaScript (JS) →
Adds interactivity and dynamic behavior to the webpage.
When a browser loads an HTML document, it doesn't just display it as raw text—it processes it and creates a structured representation that JavaScript can manipulate. This structured representation is called the Document Object Model (DOM).

2. What is the DOM?

The Document Object Model (DOM) is a programming interface for web documents. It represents the structure of an HTML or XML document as a tree-like hierarchy of objects, allowing JavaScript to interact with and modify the page dynamically.

3. How the Browser Interprets HTML & Creates the DOM

When a browser loads a webpage, it follows these steps:

1 HTML Parsing:

The browser reads the HTML file from the server and parses it line by line.

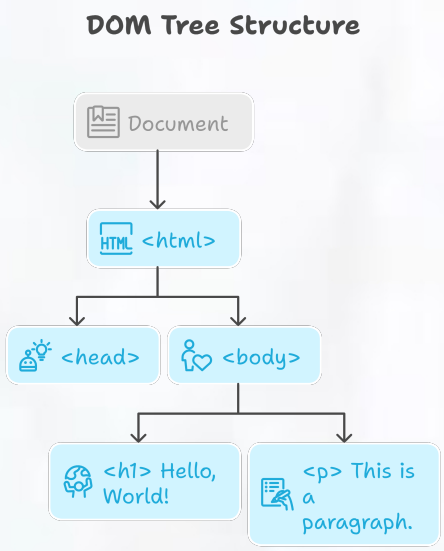
2 DOM Construction:

The browser converts the HTML into a tree structure where each HTML element becomes a node in the tree.

Example :

```
<html>
<head></head>
<body>
<h1>Hello, World!</h1>
<p>This is a paragraph.</p>
</body>
</html>
```

The DOM Tree representation:



3 CSSOM Construction (Optional, if CSS is present):

If the document includes CSS, the browser builds another structure called the CSS Object Model (CSSOM) to apply styles to the elements in the DOM.

4 Javascript Execution:

Javascript can modify the DOM dynamically using methods like document.getElementById() or document.querySelector().

5 Rendering & Painting:

The final DOM + CSSOM is used to render the webpage visually on the screen.

4. Understanding the DOM Tree Structure

The DOM represents the document as a hierarchical tree:

Document (Root)

HTML (Root element)

HEAD (Contains metadata)

BODY (Contains visible content)

H1 (Heading)

P (Paragraph)

Each part of the DOM is called a Node, and there are different types of nodes:

Element Nodes → Represent HTML tags (<h1>, <p>, etc.)

Text Nodes → Contain text inside an element

Attribute Nodes → Represent attributes like class, id, etc.