**HTML PARSER:**

HTML parsing is the process of analyzing an HTML document's structure and content to understand its elements, attributes, and relationships. This parsing process is a fundamental step in rendering web pages by web browsers. When a browser receives an HTML document from a web server, it needs to parse the HTML to create a Document Object Model (DOM) representation of the page. The DOM is an in-memory representation of the document's structure that the browser uses to render and manipulate the content.

Here's an overview of how HTML parsing works:

1. \*\*Tokenization:\*\* The HTML parser starts by breaking down the input HTML code into individual tokens. These tokens represent different elements, attributes, and content within the HTML document. Tokens include tags, attributes, text, comments, and more.
2. \*\*Lexical Analysis:\*\* The parser analyzes the tokens to identify their types and relationships. It determines where each token belongs in the document's structure.
3. \*\*DOM Construction:\*\* As the parser processes the tokens, it builds the DOM tree. The DOM tree is a hierarchical structure that represents the parent-child relationships between HTML elements. Each element in the tree corresponds to a tag in the HTML document, and attributes, text, and other content are represented as nodes within the tree.
4. \*\*Rendering:\*\* Once the DOM tree is constructed, the browser uses it to render the web page on the screen. The DOM tree provides a structured representation of the content, allowing the browser to apply styles, layout, and positioning to each element based on CSS rules and other factors.
5. \*\*JavaScript Execution:\*\* If the parsed HTML contains `<script>` tags, the browser may execute the JavaScript code within these scripts. JavaScript can interact with and modify the DOM, leading to dynamic updates on the web page.

It's important to note that parsing is just one step in the overall process of rendering a web page. After parsing, the browser performs layout and rendering, fetching external resources like style sheets and images, and executing JavaScript code. The **goal of HTML parsing is to convert the raw HTML code into a structured representation that the browser can work with to display the content correctly and allow for dynamic interactions.**

Efficient HTML parsing is crucial for web performance, as slow parsing can delay the rendering of a page. This is why best practices, such as placing scripts strategically and optimizing HTML structure, are often recommended to ensure smooth and fast page loading.