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## HTML and CSS

1 message

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HOW DOES HTML AND CSS CODE "RUN" ?

### ChatGPT said:

HTML and CSS don't "run" in the same way that programming languages like JavaScript do. Instead, they are interpreted and rendered by web browsers to create and style web pages. Here's a breakdown of how this process works:

### 1. HTML (HyperText Markup Language)

**HTML** is a markup language used to structure content on the web. Here's how it is processed:

- **Parsing:** When a browser loads an HTML document, it parses the HTML code to create a Document Object Model (DOM). The DOM is a hierarchical representation of the HTML elements on the page.
- **Rendering:** After parsing the HTML into the DOM, the browser renders the content. It builds the layout and displays the page based on the structure provided by the HTML.
- **Updates:** As the user interacts with the page, JavaScript can dynamically modify the DOM, and the browser will re-render the changes to reflect updates in real-time.

### 2. CSS (Cascading Style Sheets)

**CSS** is used to control the presentation and styling of HTML content. Here's how it is processed:

- **Parsing:** When CSS is linked or embedded in an HTML document, the browser parses the CSS rules.
- **Applying Styles:** The browser applies the CSS rules to the corresponding HTML elements. This involves calculating styles such as color, font size, layout, and positioning based on the CSS properties defined.
- **Rendering:** CSS styles affect how elements are rendered on the page. The browser creates a render tree based on the DOM and CSSOM (CSS Object Model), which it then uses to draw the page.
- **Repainting:** If CSS rules change (e.g., due to user interaction or JavaScript manipulation), the browser may repaint parts of the page to reflect the updated styles.

### Interaction Between HTML and CSS

1. **HTML and CSS Relationship:** HTML elements are styled using CSS selectors. For example, if you have an HTML element like `<h1>` and you define a CSS rule for `h1 { color: blue; }`, the browser applies the style to the `h1` elements in the DOM.
2. **Cascade and Specificity:** CSS rules are applied based on the cascade and specificity. This means that more specific or important styles will override more general ones, and styles can be inherited from parent elements.

## How the Browser Handles HTML and CSS

1. **Loading:** When you visit a webpage, the browser sends a request to the server to fetch the HTML document. It also fetches linked CSS files and other resources (like images or JavaScript).
2. **Rendering Pipeline:**
  - **HTML Parsing:** Converts the HTML document into the DOM.
  - **CSS Parsing:** Converts CSS files into the CSSOM.
  - **Render Tree Construction:** Combines the DOM and CSSOM into a render tree that represents the structure and styles of visible elements.
  - **Layout:** Calculates the positions and sizes of elements in the render tree.
  - **Painting:** Renders the visual representation of elements on the screen based on the layout and styles.
3. **Updates:** As users interact with the page, or if JavaScript modifies the DOM or CSS, the browser may need to update the render tree and repaint the page accordingly.

In summary, HTML and CSS are not executed but are instead interpreted by the browser to construct and display web pages. HTML structures the content, while CSS styles it. The browser's rendering engine handles the process of converting HTML and CSS into the visual presentation seen by users.



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