**What is CSS Compilation?**

**CSS compilation** is the process of converting code written in a CSS preprocessor language (such as Sass or LESS) into standard CSS that browsers can understand. Browsers do not natively support preprocessor languages, so the preprocessor code (written in Sass, LESS, etc.) must be **compiled** into plain CSS before it can be used in a web project.

**How CSS Compilation Works with Preprocessors:**

When you write styles using a preprocessor like **Sass** or **LESS**, you use advanced features such as variables, nesting, and mixins, which do not exist in standard CSS. The preprocessor takes this code and compiles it into valid CSS that the browser can interpret.

This process usually involves a build tool, command-line interface (CLI), or an online compiler that performs the conversion. The compiled CSS file is what you link to your HTML file for use in the browser.

**Steps Involved in Compiling Sass to CSS:**

1. **Write Sass/SCSS Code**  
   The developer writes styles using the syntax and features provided by the preprocessor (e.g., Sass).
2. **Preprocessor Compilation**  
   The preprocessor (Sass compiler) processes the code, converting it into valid CSS. This can be done using various tools like command-line commands, build systems (e.g., Gulp, Webpack), or even browser extensions.
3. **Output CSS**  
   The resulting CSS file is generated from the preprocessor code, which can then be linked in the HTML document.
4. **Use in Browser**  
   The compiled CSS is used by the browser to style the webpage.

**Example of Compiling Sass to CSS:**

**Sass Code (SCSS Syntax):**

scss

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// Variables

$primary-color: #3498db;

$font-size: 16px;

// Mixin for reusable styles

@mixin border-radius($radius) {

border-radius: $radius;

}

// Nesting example

.button {

background-color: $primary-color;

font-size: $font-size;

padding: 10px 20px;

@include border-radius(5px);

&:hover {

background-color: darken($primary-color, 10%);

}

}

**Compiled CSS Output:**

css

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.button {

background-color: #3498db;

font-size: 16px;

padding: 10px 20px;

border-radius: 5px;

}

.button:hover {

background-color: #2a7fb7;

}

**Steps to Compile Sass to CSS:**

1. **Install the Sass Compiler**  
   Using the command-line interface (CLI) to install Sass globally on your system:

bash

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npm install -g sass

1. **Run the Compilation Command**  
   To compile a .scss file to .css, run the following command in the terminal:

bash

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sass input.scss output.css

1. **CSS Output**  
   After running the command, the Sass preprocessor compiles the SCSS code into a standard .css file that the browser can read.