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Programming Languages

Lecture One

HTML Basics

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1- What is HTML?

HTML stands for Hyper Text Markup Language, which is the most widely used language on Web to develop web pages.

2- HTML Tags:

Sr.No	Tag & Description
1	<!DOCTYPE....> This tag defines the document type and HTML version.
2	<html> This tag encloses the complete HTML document and mainly comprises of document header which is represented by <head>...</head> and document body which is represented by <body>...</body> tags.
3	<head> This tag represents the document's header which can keep other HTML tags like <title>, <link> etc.
4	<title> The <title> tag is used inside the <head> tag to mention the document title.
5	<body> This tag represents the document's body which keeps other HTML tags like <h1>, <div>, <p> etc.
6	<h1> This tag represents the heading.
7	<p> This tag represents a paragraph.



3- Quick Examples:

For the following examples, just copy the HTML code to a text file, and modify the extension to .html instead of .txt, then open the file with any browser.

➤ Heading Tags Example:

HTML Code	Result
<pre><!DOCTYPE html> <html> <head> <title>Heading Example</title> </head> <body> <h1>This is heading 1</h1> <h2>This is heading 2</h2> <h3>This is heading 3</h3> <h4>This is heading 4</h4> <h5>This is heading 5</h5> <h6>This is heading 6</h6> </body> </html></pre>	<p>This is heading 1</p> <p>This is heading 2</p> <p>This is heading 3</p> <p>This is heading 4</p> <p>This is heading 5</p> <p>This is heading 6</p>



➤ Paragraph Tag Example:

HTML Code	Result
<pre><!DOCTYPE html> <html> <head> <title>Paragraph Example</title> </head> <body> <p>Here is a first paragraph of text.</p> <p>Here is a second paragraph of text.</p> <p>Here is a third paragraph of text.</p> </body> </html></pre>	<p>Here is a first paragraph of text.</p> <p>Here is a second paragraph of text.</p> <p>Here is a third paragraph of text.</p>

➤ Line Break Tag Example:

HTML Code	Result
<pre><!DOCTYPE html> <html> <head> <title>Line Break Example</title> </head> <body> <p>Hello
 You delivered your assignment ontime.
 Thanks
 Mahnaz</p> </body> </html></pre>	<p>Hello You delivered your assignment on time. Thanks Mahnaz</p>



4- HTML Tag vs. Element?

An HTML element is defined by a starting tag. If the element contains other content, it ends with a closing tag.

For example, `<p>` is starting tag of a paragraph and `</p>` is closing tag of the same paragraph but `<p>This is paragraph</p>` is a paragraph element.

5- Nested HTML Elements:

It is very much allowed to keep one HTML element inside another HTML element.

Example:

HTML Code	Result
<pre><!DOCTYPE html> <html> <head> <title>Nested Elements Example</title> </head> <body> <h1>This is <i>italic</i> heading</h1> <p>This is <u>underlined</u> paragraph</p> </body> </html></pre>	<p>This is <i>italic</i> heading</p> <p>This is <u>underlined</u> paragraph</p>

6- HTML Attribute (For more details, do a quick search):

We have seen few HTML tags and their usage like heading tags `<h1>`, `<h2>`, paragraph tag `<p>` and other tags. We used them so far in their simplest form, but most of the HTML tags can also have attributes, which are extra bits of information.



An attribute is used to define the characteristics of an HTML element and is placed inside the element's opening tag. All attributes are made up of two parts – a name and a value.

Core attributes:

- ❖ Id
- ❖ Title
- ❖ Class
- ❖ Style

Generic attributes:

Attribute	Options	Function
align	right, left, center	Horizontally aligns tags
valign	top, middle, bottom	Vertically aligns tags within an HTML element.
bgcolor	numeric, hexadecimal, RGB values	Places a background color behind an element
background	URL	Places a background image behind an element
id	User Defined	Names an element for use with Cascading Style Sheets.
class	User Defined	Classifies an element for use with Cascading Style Sheets.
width	Numeric Value	Specifies the width of tables, images, or table cells.
height	Numeric Value	Specifies the height of tables, images, or table cells.



Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>Align Attribute Example</title> </head> <body> <p id = "p1" align = "left">This is left aligned</p> <p id = "p2" align = "center">This is center aligned</p> <p id = "p3" align = "right">This is right aligned</p> </body> </html></pre>		
Result	This is left aligned	This is center aligned	This is right aligned

7- Comments:

Comment is a piece of code which is ignored by any web browser. It is a good practice to add comments into your HTML code, especially in complex documents, to indicate sections of a document, and any other notes to anyone looking at the code. Comments help you and others understand your code and increases code readability.



Example:

```
<!DOCTYPE html>
<html>

  <head>  <!-- Document Header Starts -->
    <title>This is document title</title>
  </head> <!-- Document Header Ends -->

  <body>
    <p>Document content goes here.....</p>
  </body>

</html>
```

8- Images:

You can insert any image in your web page by using tag. Following is the simple syntax to use this tag.

```
<img src = "Image URL" ... attributes-list/>
```

Example: (To try following example, keep your HTML file test.html and image file test.png in the same directory)

HTML Code

```
<!DOCTYPE html>
<html>

  <head>
    <title>Using Image in Webpage</title>
  </head>

  <body>
    <p>Simple Image Insert</p>
    <img src = "/html/images/test.png" alt = "Test Image" />
  </body>

</html>
```




Result	Simple Image Insert	
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Example: (Set Image Width/Height)

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>Set Image Width and Height</title> </head> <body> <p> Simple Image Insert</p> </body> </html></pre>	
Result	Simple Image Insert	



9- Tables:

The HTML tables allow web authors to arrange data like text, images, links, other tables, etc. into rows and columns of cells.

The HTML tables are created using the **<table>** tag in which the **<tr>** tag is used to create table rows and **<td>** tag is used to create data cells. The elements under **<td>** are regular and left aligned by default

Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>HTML Tables</title> </head> <body> <table border = "1"> <tr> <td>Row 1, Column 1</td> <td>Row 1, Column 2</td> </tr> <tr> <td>Row 2, Column 1</td> <td>Row 2, Column 2</td> </tr> </table> </body> </html></pre>				
Result	<table border="1"><tr><td>Row 1, Column 1</td><td>Row 1, Column 2</td></tr><tr><td>Row 2, Column 1</td><td>Row 2, Column 2</td></tr></table>	Row 1, Column 1	Row 1, Column 2	Row 2, Column 1	Row 2, Column 2
Row 1, Column 1	Row 1, Column 2				
Row 2, Column 1	Row 2, Column 2				



10- Unordered Lists:

An unordered list is a collection of related items that have no special order or sequence. This list is created by using HTML `` tag. Each item in the list is marked with a bullet

Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>HTML Unordered List</title> </head> <body> Beetroot Ginger Potato Radish </body> </html></pre>
Result	<ul style="list-style-type: none">• Beetroot• Ginger• Potato• Radish



11- Ordered Lists:

Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>HTML Ordered List</title> </head> <body> Beetroot Ginger Potato Radish </body> </html></pre>	
Result		<ol style="list-style-type: none">1. Beetroot2. Ginger3. Potato4. Radish

12- Linking Documents:

A webpage can contain various links that take you directly to other pages and even specific parts of a given page.

A link is specified using HTML tag `<a>`. This tag is called anchor tag and anything between the opening `<a>` tag and the closing `` tag becomes part of the link and a user can click that part to reach to the linked document. Following is the simple syntax to use `<a>` tag.

```
<a href = "Document URL" ... attributes-list>Link Text</a>
```



Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>Hyperlink Example</title> </head> <body> <p>Click following link</p> Example </body> </html></pre>		
Result		Click following link	
		Example	

13- Style Sheet:

Cascading Style Sheets (CSS) describe how documents are presented on screens, in print, or perhaps how they are pronounced.

Cascading Style Sheets (CSS) provide easy and effective alternatives to specify various attributes for the HTML tags. Using CSS, you can specify a number of style properties for a given HTML element. Each property has a name and a value, separated by a colon (:). Each property declaration is separated by a semi-colon (;).



Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>HTML CSS</title> </head> <body> <p style = "color:green; font-size:24px;" >Hello, World!</p> </body> </html></pre>		
Result		Hello, World!	

You can use CSS in three ways in your HTML document:

- **External Style Sheet:** Define style sheet rules in a separate .css file and then include that file in your HTML document using HTML <link> tag.
- **Internal Style Sheet:** Define style sheet rules in header section of the HTML document using <style> tag.
- **Inline Style Sheet:** Define style sheet rules directly along-with the HTML elements using style attribute.



External Style Sheet:

If you need to use your style sheet to various pages, then its always recommended to define a common style sheet in a separate file. A cascading style sheet file will have extension as .css and it will be included in HTML files using <link> tag.

Example (create a style sheet file style.css in the same directory of html file):

style.css file	<pre>.red { color: red; } .thick { font-size:20px; } .green { color:green; }</pre>
HTML Code	<pre><!DOCTYPE html> <html> <head> <title>HTML External CSS</title> <link rel = "stylesheet" type = "text/css" href = "/html/style.css"> </head> <body> <p class = "red">This is red</p> <p class = "thick">This is thick</p> <p class = "green">This is green</p> <p class = "thick green">This is thick and green</p> </body> </html></pre>



Result	<p>This is red</p> <p>This is thick</p> <p>This is green</p> <p>This is thick and green</p>
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Internal Style Sheet:

If you want to apply Style Sheet rules to a single document only, then you can include those rules in header section of the HTML document using `<style>` tag.

Rules defined in internal style sheet overrides the rules defined in an external CSS file.

Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>HTML Internal CSS</title> <style type = "text/css"> .red { color: red; } .thick{ font-size:20px; } .green { color:green; } </style> </head></pre>
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	<pre><body> <p class = "red">This is red</p> <p class = "thick">This is thick</p> <p class = "green">This is green</p> <p class = "thick green">This is thick and green</p> </body> </html></pre>
Result	<p>This is red</p> <p>This is thick</p> <p>This is green</p> <p>This is thick and green</p>

Inline Style Sheet:

You can apply style sheet rules directly to any HTML element using style attribute of the relevant tag. This should be done only when you are interested to make a particular change in any HTML element only.

Rules defined inline with the element overrides the rules defined in an external CSS file as well as the rules defined in <style> element.

Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>HTML Inline CSS</title> </head> <body> <p style = "color:red;">This is red</p> <p style = "font-size:20px;">This is thick</p> <p style = "color:green;">This is green</p></pre>
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	<pre><p style = "color:green;font-size:20px;">This is thick and green</p> </body> </html></pre>
Result	<div>This is red</div> <div>This is thick</div> <div>This is green</div> <div>This is thick and green</div>

14- JavaScript:

A script is a small piece of program that can add interactivity to your website. For example, a script could generate a pop-up alert box message, or provide a dropdown menu. This script could be written using JavaScript or VBScript.

You can write various small functions, called event handlers using any of the scripting language and then you can trigger those functions using HTML attributes.

Now-a-days, only JavaScript and associated frameworks are being used by most of the web developers, VBScript is not even supported by various major browsers.

You can keep JavaScript code in a separate file and then include it wherever it's needed, or you can define functionality inside HTML document itself. Let's see both the cases one by one with suitable examples.



External JavaScript

If you are going to define a functionality which will be used in various HTML documents then it's better to keep that functionality in a separate JavaScript file and then include that file in your HTML documents. A JavaScript file will have extension as .js and it will be included in HTML files using <script> tag.

Example (create a javascript file script.js in the same directory of html file):

script.js file	<pre>function Hello() { alert("Hello, World"); }</pre>
HTML Code	<pre><!DOCTYPE html> <html> <head> <title>Javascript External Script</title> <script src = "/html/script.js" type = "text/javascript"/></script> </head> <body> <input type = "button" onclick = "Hello();" name = "ok" value = "Click Me" /> </body> </html></pre>
Result	<div>Click Me</div>



Internal JavaScript

You can write your script code directly into your HTML document. Usually we keep script code in header of the document using `<script>` tag, otherwise there is no restriction and you can put your source code anywhere in the document but inside `<script>` tag.

Example:

HTML Code	<pre><!DOCTYPE html> <html> <head> <title>JavaScript Internal Script</title> <script type = "text/JavaScript"> function Hello() { alert("Hello, World"); } </script> </head> <body> <input type = "button" onclick = "Hello();" name = "ok" value = "Click Me" /> </body> </html></pre>
Result	<div>Click Me</div>