INTRODUCTION TO HTML FUNDAMENTALS AND HTML TABLES/IMAGES/FORMS

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Lecture 2, WEEK 2

LAST TIME

- ❏ Web Development Roadmaps
- ❏ HTTP/WWW
- ❏ HTTP Request and HTTP Responses

TODAY

- ❏ Introduction to HTML Fundamentals
- ❏ HTML Tables/Images/Forms

HTML - Overview

HTML stands for **H**yper**t**ext **M**arkup **L**anguage, and it is the most widely used language to write Web Pages. Hypertext refers to the way in which Web pages (HTML documents) are linked together. Thus, the link available on a webpage is called Hypertext. As its name suggests, HTML is a Markup Language which means you use HTML to simply "mark-up" a text document with tags that tell a Web browser how to structure it to display.

Originally, HTML was developed with the intent of defining the structure of documents like headings, paragraphs, lists, and so forth to facilitate the sharing of scientific information between researchers. Now, HTML is being widely used to format web pages with the help of different tags available in HTML language.

Basic HTML Document

In its simplest form, following is an example of an HTML document:

```
<!DOCTYPE html>
<html>
   <head>
       <title>This is document title</title>
   </head>
   <body>
       <h1>This is a heading</h1>
       <p>Document content goes here.....</p>
   </body>
</html>
```

Either you can try the code on your notepad to check the result of this HTML code, or let's save it in an HTML file test.html using your favorite text editor. Finally open it using a web browser like Internet Explorer or Google Chrome, or Firefox etc.

HTML Tags

As told earlier, HTML is a markup language and makes use of various tags to format the content. These tags are enclosed within angle braces <Tag Name>. Except for a few tags, most of the tags have their corresponding closing tags. For example,<html>has its closing tag </html> and <body> tag has its closing tag </body> tag etc.

Above example of HTML document uses the following tags:

Tag	**Description**
<!DOCTYPE...>	This tag defines the document type and HTML version. The <!DOCTYPE> declaration tag is used by the web browser to understand the version of the HTML used in the document. Current version of HTML is 5 and it makes use of the following declaration:
<html>	This tag encloses the complete HTML document and mainly comprises a document header which is represented by<head>...</head>and a document body which is represented by<body>...</body>tags.
<head>	This tag represents the document's header which can keep other HTML tags like <title>, <link> etc.
<title>	The<title>tag is used inside the <head> tag to mention the document title
<body>	This tag represents the document's body which keeps other HTML tags like <h1>, <div>, <p> etc
<h1>	This tag represents the heading. Any document starts with a heading. You can use different sizes for your headings. HTML also has six levels of headings, which use the elements<h1>, <h2>, <h3>, <h4>, <h5>, and <h6>. While displaying any heading, the browser adds one line before and one line after that heading.
<p/>	This tag represents a paragraph. The<p>tag offers a way to structure your text into different paragraphs. Each paragraph of text should go in between an opening <p> and a closing </p> tag

<br />	Line Break Tag - Whenever you use the<br />element, anything following it starts from the next line. This tag is an example of an empty element, where you do not need opening and closing tags, as there is nothing to go in between them.The <br /> tag has a space between the characters and the forward slash. If you omit this space, older browsers will have trouble rendering the line break, while if you miss the forward slash character and just use <br> it is not valid in XHTML.
<hr />	Horizontal Lines - Horizontal lines are used to visually break-up sections of a document. The<hr>tag creates a line from the current position in the document to the right margin and breaks the line accordingly. Again<hr />tag is an example of the empty element, where you do not need opening and closing tags, as there is nothing to go in between them.The <hr />element has a space between the characters to read the forward slash. If you omit this space, older browsers will have trouble rendering the horizontal line, while if you miss the forward slash character and just use <hr>it is not valid in XHTML

To learn HTML, you will need to study various tags and understand how they behave,while formatting a textual document. Learning HTML is simple as users have to learn the usage of different tags in order to format the text or images to make a beautiful webpage.

World Wide Web Consortium (W3C) recommends to use lowercase tags starting from HTML 4.

HTML - Elements

An HTML element is defined by a starting tag. If the element contains other content, it ends with a closing tag, where the element name is preceded by a forward slash as shown below with few tags

Start Tags	Contents	End tags
<p>	This is paragraph content.	</p>
<h1>	This is heading content	</h1>
<div>	This is division content.	</div>
<br />		

So here <p>....</p>is an HTML element, <h1>...</h1>is another HTML element. There are some HTML elements which don't need to be closed, such as <img.../>, <hr />and <br />elements. These are known as void elements. HTML documents consist of a tree of these elements and they specify how HTML documents should be built, and what kind of content should be placed in what part of an HTML document.

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

HTML - Attributes

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 **value**:

- The **name** is the property you want to set. For example, the paragraph <p>element in the example carries an attribute whose name is align, which you can use to indicate the alignment of paragraphs on the page.
- The **value** is what you want the value of the property to be set and always put within quotations. The below example shows three possible values of the align attribute: **left**, **center** and **right**.

Attribute names and attribute values are case-insensitive. However, the World Wide Web Consortium (W3C) recommends lowercase attributes/attribute values in their HTML 4 recommendation.

Core Attributes

The four core attributes that can be used on the majority of HTML elements (although not all) are:

- Id
- Title
- Class
- Style

The Id Attribute

The Id Attribute of an HTML tag can be used to uniquely identify any element within an HTML page. There are two primary reasons that you might want to use an id attribute on an element:

- If an element carries an id attribute as a unique identifier,it is possible to identify just that element and its content.
- If you have two elements of the same name within a Web page (or style sheet), you can use the id attribute to distinguish between elements that have the same name.

Example

```
<p id="html">This para explains what is HTML</p>
<p id="css">This para explains what is Cascading Style Sheet</p>
```

The title Attribute

The title attribute gives a suggested title for the element. The syntax for the title attribute is similar as explained for id attribute:

The behavior of this attribute will depend upon the element that carries it, although it is often displayed as a tooltip when the cursor comes over the element or while the element is loading.

The class Attribute

The class attribute is used to associate an element with a style sheet, and specifies the class of element. You will learn more about the use of the class attribute when you will learn Cascading Style Sheet (CSS). So for now you can avoid it.The value of the attribute may also be a space-separated list of class names. For example

```
class="className1 className2 className3"
```

The style Attribute

The style attribute allows you to specify CascadingStyle Sheet (CSS) rules within the element.

At this point of time, we are not learning CSS, so just let's proceed without bothering much about CSS. Here,you need to understand what are HTML attributes and how they can be used while formatting content

HTML Forms

An HTML form is used to collect user input. The user input is most often sent to a server for processing.

The <form> Element

The HTML <form> element is used to create an HTML form for user input: The <form> element is a container for different types of input elements, such as: text fields, checkboxes, radio buttons, submit buttons, etc.

The <input> Element

The HTML <input> element is the most used form element. An <input> element can be displayed in many ways, depending on the type attribute.

Here are some examples:

Type	Description
<input type="text">	Displays a single-line text input field
<input type="radio">	Displays a radio button (for selecting one of many choices)
<input type="checkbox">	Displays a checkbox (for selecting zero or more of many choices)
<input type="submit">	Displays a submit button (for submitting the form)
<input type="button">	Displays a clickable button

Text Fields

The <input type="text"> defines a single-line input field for text input.

Example A form with input fields for text:

```
<form>

   <label for="fname">First name:</label><br>

   <input type="text" id="fname" name="fname"><br>

   <label for="lname">Last name:</label><br>

   <input type="text" id="lname" name="lname">

 </form>
```

The <label> Element

Notice the use of the <label> element in the example above.

The <label> tag defines a label for many form elements.

The <label> element is useful for screen-reader users, because the screen-reader will read out loud the label when the user focus on the input element.

The <label> element also help users who have difficulty clicking on very small regions (such as radio buttons or checkboxes) - because when the user clicks the text within the <label> element, it toggles the radio button/checkbox.

The for attribute of the <label> tag should be equal to the id attribute of the <input> element to bind them together.

The Name Attribute for <input>

Notice that each input field must have a name attribute to be submitted. If the name attribute is omitted, the value of the input field will not be sent at all.

Example: This example will not submit the value of the "First name" input field:

```
<form action="/action_page.php">

   <label for="fname">First name:</label><br>

   <input type="text" id="fname" value="John"><br><br>

   <input type="submit" value="Submit">

</form>
```

The Action Attribute

The action attribute defines the action to be performed when the form is submitted. Usually, the form data is sent to a file on the server when the user clicks on the submit button. In the example below, the form data is sent to a file called "action_page.php". This file contains a server-side script that handles the form data:

Example: On submit, send form data to "action_page.php":

```
<form action="/action_page.php">

   <label for="fname">First name:</label><br>

   <input type="text" id="fname" name="fname" value="John"><br>

   <label for="lname">Last name:</label><br>

   <input type="text" id="lname" name="lname" value="Doe"><br><br>

   <input type="submit" value="Submit">

</form>
```

Tip: If the action attribute is omitted, the action is set to the current page.

The Target Attribute

The target attribute specifies where to display the response that is received after submitting the form. The target attribute can have one of the following values:

Type	Description
_blank	The response is displayed in a new window or tab
_self	The response is displayed in the current window
_parent	The response is displayed in the parent frame
_top	The response is displayed in the full body of the window

The default value is _self which means that the response will open in the current window.

Example: Here, the submitted result will open in a new browser tab:

```
<form action="/action_page.php" target="_blank">
```

The Method Attribute

The method attribute specifies the HTTP method to be used when submitting the form data. The form-data can be sent as URL variables (with method="get") or as HTTP post transaction (with method="post"). The default HTTP method when submitting form data is GET.

Example This example uses the GET method when submitting the form data:

```
<form action="/action_page.php" method="get">
```

```
<form action="/action_page.php" method="post">
```

Notes on GET:

- Appends the form data to the URL, in name/value pairs
- NEVER use GET to send sensitive data! (the submitted form data is visible in the URL!)
- The length of a URL is limited (2048 characters)
- Useful for form submissions where a user wants to bookmark the result
- GET is good for non-secure data, like query strings in Google

Notes on POST:

- Appends the form data inside the body of the HTTP request (the submitted form data is not shown in the URL)
- POST has no size limitations, and can be used to send large amounts of data.

- ❑ Form submissions with POST cannot be bookmarked

The Autocomplete Attribute

The autocomplete attribute specifies whether a form should have autocomplete on or off. When autocomplete is on, the browser automatically complete values based on values that the user has entered before.

```
<form action="/action_page.php" autocomplete="on">
```

The Novalidate Attribute

The novalidate attribute is a boolean attribute. When present, it specifies that the form-data (input) should not be validated when submitted.

```
<form action="/action_page.php" novalidate>
```

HTML Images

Images can improve the design and the appearance of a web page.

HTML Images Syntax

The HTML <img> tag is used to embed an image in a web page. Images are not technically inserted into a web page; images are linked to web pages. The <img> tag creates a holding space for the referenced image. The <img> tag is empty, it contains attributes only, and does not have a closing tag.

The <img> tag has two required attributes:

- ❑ src - Specifies the path to the image
- ❑ alt - Specifies an alternate text for the image

The src Attribute

The required src attribute specifies the path (URL) to the image.

Note: When a web page loads; it is the browser, at that moment, that gets the image from a web server and inserts it into the page. Therefore, make sure that the image actually stays in the same spot in relation to the web page, otherwise your visitors will get a broken link icon. The broken link icon and the alt text are shown if the browser cannot find the image.

The alt Attribute

The required alt attribute provides an alternate text for an image, if the user for some reason cannot view it (because of slow connection, an error in the src attribute, or if the user uses a screen reader). The value of the alt attribute should describe the image:

If a browser cannot find an image, it will display the value of the alt attribute:

Image Size - Width and Height

You can use the style attribute to specify the width and height of an image. Alternatively, you can use the width and height attributes: The width and height attributes always define the width and height of the image in pixels.

Width and Height, or Style?

The width, height, and style attributes are all valid in HTML. However, we suggest using the style attribute. It prevents styles sheets from changing the size of images:

```
<!DOCTYPE html>

<html>

   <head>

       <style>

           img {

               width: 100%;

           }

       </style>

   </head>

   <body>

       <img src="html5.gif" alt="HTML5 Icon" width="128" height="128">

       <img src="html5.gif" alt="HTML5 Icon" style="width:128px;height:128px;">

   </body>

</html>
```

Images in Another Folder

If you have your images in a sub-folder, you must include the folder name in the src attribute:

```
<img src="/images/html5.gif" alt="HTML5 Icon" style="width:128px;height:128px;">
```

Images on Another Server/Website

Some web sites point to an image on another server. To point to an image on another server, you must specify an absolute (full) URL in the src attribute.

```
<img src="https://www.w3schools.com/images/w3schools_green.jpg"
alt="W3Schools.com">
```

Notes on external images: External images might be under copyright. If you do not get permission to use it, you may be in violation of copyright laws. In addition, you cannot control external images; it can suddenly be removed or changed.

Animated Images

HTML allows animated GIFs:

```
<img src="programming.gif" alt="Computer Man" style="width:48px;height:48px;">
```

Image as a Link

To use an image as a link, put the <img> tag inside the <a> tag:

```
<a href="default.asp">

  <img src="smiley.gif" alt="HTML tutorial" style="width:42px;height:42px;">

</a>
```

HTML Tables

HTML tables allow web developers to arrange data into rows and columns.

Define an HTML Table

The <table> tag defines an HTML table.

Each table row is defined with a <tr> tag. Each table header is defined with a <th> tag. Each table data/cell is defined with a <td> tag.

By default, the text in <th> elements are bold and centered.

By default, the text in `<td>` elements are regular and left-aligned.

```
<table style="width:100%">
   <tr>
       <th>Firstname</th>
       <th>Lastname</th>
       <th>Age</th>
   </tr>
   <tr>
       <td>Jill</td>
       <td>Smith</td>
       <td>50</td>
   </tr>
   <tr>
       <td>Eve</td>
       <td>Jackson</td>
       <td>94</td>
   </tr>
</table>
```

HTML Table - Add a Border

To add a border to a table, use the CSS `border` property:

```
table, th, td {
  border: 1px solid black;
}
```

HTML Table Tags

Tag	Description
<table>	Defines a table
<th>	Defines a header cell in a table
<tr>	Defines a row in a table
<td>	Defines a cell in the table
<caption>	Defines a table caption
<colgroup>	Specifies a group of one or more columns in a table for formatting

<col>	Specifies column properties for each column within a <colgroup> element
<thead>	Groups the header content in a table
<tbody>	Groups the body content in a table
<tfoot>	Groups the bfooterody content in a table

Further Reading

https://www.w3schools.com/whatis/whatis_html.asp

https://www.w3schools.com/html.asp

https://www.w3schools.com/html/html_tables.asp

https://www.w3schools.com/html/html_images.asp

https://www.w3schools.com/html/html_forms.asp

https://www.tutorialspoint.com/html/html_tutorial.pdf

Code Sample