Chapter - 4

HTML Elements

Introduction:
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 *(aghillo)* by a forward slash as shown below with few tags −

Start Tag	Content	End Tag
<p>	This is paragraph content.	</p>
<h1>	This is heading content.	</h1>
<div>	This is division content.	</div>

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 **
** elements. These are known as **void elements**.

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

Nested HTML Elements
It is very much allowed to keep one HTML element inside another HTML element −

```
<!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>
```

Heading:

A HTML heading tag is used to define the headings of a page. There are six levels of headings defined by HTML. These 6 heading elements are h1, h2, h3, h4, h5, and h6; with h1 being the highest level and h6 being the least.

<h1>is used for main heading. (Biggest in size)

<h2>is used for subheadings

if there are further sections under the subheadings then the <h3> elements is used.

<h6> for the small heading (smallest one).

```html
<!DOCTYPE html>
<html>
<head>
    <title>Heading Tags</title>
</head>
<body>
    <h1>GeeksforGeeks</h1>
    <h2>GeeksforGeeks</h2>
    <h3>GeeksforGeeks</h3>
    <h4>GeeksforGeeks</h4>
    <h5>GeeksforGeeks</h5>
    <h6>GeeksforGeeks</h6>
</body>
</html>
```

Paragraph:

The **<p>** tag in HTML defines a paragraph. These have both opening and closing tags. So anything mentioned within **<p>** and **</p>** is treated as a paragraph. Most browsers read a line as a paragraph even if we don't use the closing tag i.e, </p>, but this may raise unexpected results. So, it is both a good convention, and we **must** use the closing tag.

```html
<!DOCTYPE html>
<html>
<body>
    <h2>Welcome To GeeksforGeeks</h2>
    <!-- Use of <p> tag -->
<p>A computer science portal for geeks.</p>
</body>
</html>
```

Line Breaking:

The
 [HTML](#) element produces a line break in text (carriage-return). It is useful for writing a poem or an address, where the division of lines is significant.
Syntax:

As you can see from the above example, a `<br>` element is included at each point where we want the text to break. The text after the `<br>` begins again at the start of the next line of the text block.

Horizontal Line:

The <hr> tag in HTML stands for horizontal rule and is used to insert a horizontal rule or a thematic break in an HTML page to divide or separate document sections. The <hr> tag is an empty tag, and it does not require an end tag.

Tag Attributes: The table given below describe the <hr> tag attributes. **These attributes are not supported in HTML5:**

Attribute	Value	Description
align	left center right	**Used to specify the alignment of the horizontal rule.**
noshade	noshade	**Used to specify the bar without shading effect.**
size	pixels	**Used to specify the height of the horizontal rule.**
width	pixels	**Used to specify the width of the horizontal rule.**

Syntax:
<hr/>

Text Formatting:

HTML Formatting is a process of formatting text for better look and feel. HTML provides us ability to format text without using CSS. There are many formatting tags in HTML. These tags are used to make text bold, italicized, or underlined. There are almost 14 options available that how text appears in HTML

Element name	Description
<b>	This is a physical tag, which is used to bold the text written between it.
<strong>	This is a logical tag, which tells the browser that the text is important.
<i>	This is a physical tag which is used to make text italic.
<em>	This is a logical tag which is used to display content in italic.
<mark>	This tag is used to highlight text.
<u>	This tag is used to underline text written between it.
<tt>	This tag is used to appear a text in teletype. (not supported in HTML5)
<strike>	This tag is used to draw a strikethrough on a section of text. (Not supported in HTML5)
<sup>	It displays the content slightly above the normal line.

<sub>	It displays the content slightly below the normal line.
<del>	This tag is used to display the deleted content.
<ins>	This tag displays the content which is added
<big>	This tag is used to increase the font size by one conventional unit.
<small>	This tag is used to decrease the font size by one unit from base font size.

Lists:

HTML Lists are used to specify lists of information. All lists may contain one or more list elements. There are three different types of HTML lists:

1. Ordered List or Numbered List (ol)
2. Unordered List or Bulleted List (ul)
3. Description List or Definition List (dl)

Ordered List or Numbered List:
In the ordered HTML lists, all the list items are marked with numbers by default. It is known as numbered list also. The ordered list starts with <ol> tag and the list items start with <li> tag.

 Aries
 Bingo
 Leo
 Oracle


```
Output:

    1. Aries
    2. Bingo
    3. Leo
    4. Oracle
```

Type Attribtute:
```
<ol type = "i">
<ol type = "a">
<ol type = "A">
```

Unordered List or Bulleted List:
In HTML Unordered list, all the list items are marked with bullets. It is also known as bulleted list also. The Unordered list starts with <ul> tag and list items start with the <li> tag.

 Aries
 Bingo
 Leo
 Oracle

```
</ul>
```

Output:

- ○ Aries
- ○ Bingo
- ○ Leo
- ○ Oracle

Type Attribtute:
```
<ul type = "square">
<ul type = "disc">
<ul type = "circle">
```

Description List or Definition List:

HTML Description list is also a list style which is supported by HTML and XHTML. It is also known as definition list where entries are listed like a dictionary or encyclopedia.

The definition list is very appropriate when you want to present glossary, list of terms or other name-value list.
The HTML definition list contains following three tags:

1. **<dl> tag** defines the start of the list.
2. **<dt> tag** defines a term.
3. **<dd> tag** defines the term definition (description).

3.

```
<dl>
 <dt>Aries</dt>
 <dd>-One of the 12 horoscope sign.</dd>
 <dt>Bingo</dt>
 <dd>-One of my evening snacks</dd>
 <dt>Leo</dt>
 <dd>-It is also an one of the 12 horoscope sign.</dd>
 <dt>Oracle</dt>
 <dd>-It is a multinational technology corporation.</dd>
</dl>
```

Aries
        -One of the 12 horoscope sign.
Bingo
        -One of my evening snacks
Leo
        -It is also an one of the 12 horoscope sign.
Oracle
        -It is a multinational technology corporation.

HTML Tables:

What is a Table in HTML?

A table is a representation of data arranged in rows and columns. Really, it's more like a spreadsheet. In HTML, with the help of tables, you can arrange data like images, text, links and so on into rows and columns of cells.

The use of tables in the web has become more popular recently because of the amazing HTML table tags that make it easier to create and design them.

To create a table in HTML you will need to use tags. The most important one is the `<table>` tag which is the main container of the table. It shows where the table will begin and where it ends.

Common HTML Table tags

Other tags include:

- `<tr>` - represents rows
- `<td>` - used to create data cells
- `<th>` - used to add table headings
- `<caption>` - used to insert captions
- `<thead>` - adds a separate header to the table
- `<tbody>` - shows the main body of the table
- `<tfoot>` - creates a separate footer for the table

```
<table>
  <tr>
    <th>First Name</th>
    <th>Last Name</th>
    <th>Email Address</th>
  </tr>
  <tr>
   <td>Hillary</td>
   <td>Nyakundi</td>
   <td>tables@mail.com</td>
  </tr>
  <tr>
    <td>Lary</td>
    <td>Mak</td>
    <td>developer@mail.com</td>
  </tr>
</table>
```

FIRST NAME	LAST NAME	EMAIL ADDRESS
Hillary	Nyakundi	tables@mail.com
Lary	Mak	developer@mail.com

From the example above, we are able to tell what column contains which information. This is made possible with the use of `<th>` tag.

HTML Table Colspan & Rowspan

HTML tables can have cells that span over multiple rows and/or columns.

HTML Table - Colspan

To make a cell span over multiple columns, use the `colspan` attribute:

```
<!DOCTYPE html>
<html>
<head>
<style>
table, th, td {
  border: 1px solid black;
  border-collapse: collapse;
}
</style>
</head>
<body>

<h2>Cell that spans two columns</h2>
<p>To make a cell span more than one column, use the colspan attribute.</p>

<table style="width:100%">
  <tr>
    <th colspan="2">Name</th>
    <th>Age</th>
  </tr>
  <tr>
    <td>Jill</td>
    <td>Smith</td>
    <td>43</td>
  </tr>
  <tr>
    <td>Eve</td>
    <td>Jackson</td>
    <td>57</td>
  </tr>
</table>
</body>
</html>
```

Cell that spans two columns

To make a cell span more than one column, use the colspan attribute.

Name		Age
Jill	Smith	43
Eve	Jackson	57

HTML Table - Rowspan

To make a cell span over multiple rows, use the `rowspan` attribute:

```html
<!DOCTYPE html>
<html>
<head>
<style>
table, th, td {
  border: 1px solid black;
  border-collapse: collapse;
}
</style>
</head>
<body>

<h2>Cell that spans two rows</h2>
<p>To make a cell span more than one row, use the rowspan attribute.</p>

<table style="width:100%">
  <tr>
    <th>Name</th>
    <td>Jill</td>
  </tr>
  <tr>
    <th rowspan="2">Phone</th>
    <td>555-1234</td>
  </tr>
  <tr>
    <td>555-8745</td>
  </tr>
</table>
</body>
</html>
```

Cell that spans two rows

To make a cell span more than one row, use the rowspan attribute.

Name	Jill
Phone	555-1234
	555-8745

HTML Hyper Link:

The `<a>` tag defines a hyperlink, which is used to link from one page to another.

The most important attribute of the `<a>` element is the `href` attribute, which indicates the link's destination.

By default, links will appear as follows in all browsers:

- An unvisited link is underlined and blue
- A visited link is underlined and purple
- An active link is underlined and red

Hyperlinks can be presented in different forms, like an image, icon, text, or any type of visible element that, when clicked, redirects you to a specified url.

Tip: If the `<a>` tag has no `href` attribute, it is only a placeholder for a hyperlink.

Tip: A linked page is normally displayed in the current browser window, unless you specify another target.

Commonly Used Attribute:

Attribute	Value	Description
download	*filename*	Specifies that the target will be downloaded when a user clicks on the hyperlink
href	*URL*	Specifies the URL of the page the link goes to
target	_blank _parent _self _top	Specifies where to open the linked document
type	*media_type*	Specifies the media type of the linked document

Syntax:

```
<a href="URL">LinkName</a>
```

Multimedia In HTML (Image, Audio, Video):

HTML Images:

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

The `<img>` tag is used to embed an image in an HTML 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 has two required attributes:

- **src** - Specifies the path to the image
- **alt** - Specifies an alternate text for the image, if the image for some reason cannot be displayed

Note: Also, always specify the width and height of an image. If width and height are not specified, the page might flicker while the image loads.

Syntax:

<img src="smiley.gif" alt="Smiley face" width="42" height="42" style="vertical-align:bottom">

HTML Audio:

HTML `<audio>` tag is used to define sounds such as music and other audio clips. Currently there are three supported file format for HTML 5 audio tag.

1. mp3
2. wav
3. ogg

example:

```
<audio controls>
 <source src="horse.ogg" type="audio/ogg">
 <source src="horse.mp3" type="audio/mpeg">
Your browser does not support the audio element.
</audio>
```

HTML Audio - How It Works

The `controls` attribute adds audio controls, like play, pause, and volume.
The `<source>` element allows you to specify alternative audio files which the browser may choose from. The browser will use the first recognized format.
The text between the `<audio>` and `</audio>` tags will only be displayed in browsers that do not support the `<audio>` element.

Autoplay
Muted

HTML Video:

HTML 5 supports <video> tag also. The HTML video tag is used for streaming video files such as a movie clip, song clip on the web page.

Currently, there are three video formats supported for HTML video tag:

1. mp4
2. webM
3. ogg

```
<video width="320" height="240" controls>
  <source src="movie.mp4" type="video/mp4">
  <source src="movie.ogg" type="video/ogg">
Your browser does not support the video tag.
</video>
```

How it Works

The `controls` attribute adds video controls, like play, pause, and volume.

It is a good idea to always include `width` and `height` attributes. If height and width are not set, the page might flicker while the video loads.

The `<source>` element allows you to specify alternative video files which the browser may choose from. The browser will use the first recognized format.

The text between the `<video>` and `</video>` tags will only be displayed in browsers that do not support the `<video>` element.

HTML Forms:

HTML Forms are required, when you want to collect some data from the site visitor. For example, during user registration you would like to collect information such as name, email address, credit card, etc.

A form will take input from the site visitor and then will post it to a back-end application such as CGI, ASP Script or PHP script etc. The back-end application will perform required processing on the passed data based on defined business logic inside the application.

There are various form elements available like text fields, textarea fields, drop-down menus, radio buttons, checkboxes, etc.

The HTML **<form>** tag is used to create an HTML form and it has following syntax –

```
<form action = "Script URL" method = "GET|POST">
   form elements like input, textarea etc.
</form>
```

Form Attributes

Apart from common attributes, following is a list of the most frequently used form attributes

Sr.No	Attribute & Description
1	**action** Backend script ready to process your passed data.
2	**method** Method to be used to upload data. The most frequently used are GET and POST methods.
3	**target** Specify the target window or frame where the result of the script will be displayed. It takes values like _blank, _self, _parent etc.
4	**tlipart/form-data** This is used when you want to upload binary data in the form of files like image, word file etc.

HTML Form Controls

There are different types of form controls that you can use to collect data using HTML form

- Text Input Controls
- Checkboxes Controls
- Radio Box Controls
- Select Box Controls
- File Select boxes
- Hidden Controls
- Clickable Buttons
- Submit and Reset Button

HTML Form Tags:

Let's see the list of HTML 5 form tags.

Tag	Description
<form>	It defines an HTML form to enter inputs by the used side.
<input>	It defines an input control.
<textarea>	It defines a multi-line input control.
<label>	It defines a label for an input element.
<legend>	It defines a caption for a <fieldset> element.
<select>	It defines a drop-down list.
<optgroup>	It defines a group of related options in a drop-down list.
<option>	It defines an option in a drop-down list.
<button>	It defines a clickable button.

HTML <input> element

The HTML <input> element is fundamental form element. It is used to create form fields, to take input from user. We can apply different input filed to gather different information form user.

Following is the example to show the simple text input.

Example:
```
<body>
 <form>
   Enter your name  <br>
   <input type="text" name="username">
 </form>
</body>
```

Enter your name

HTML Input Types

Here are the different input types you can use in HTML:

- `<input type="button">`
- `<input type="checkbox">`
- `<input type="color">`
- `<input type="date">`
- `<input type="datetime-local">`
- `<input type="email">`
- `<input type="file">`
- `<input type="hidden">`
- `<input type="image">`
- `<input type="month">`
- `<input type="number">`
- `<input type="password">`
- `<input type="radio">`
- `<input type="range">`
- `<input type="reset">`
- `<input type="search">`
- `<input type="submit">`
- `<input type="tel">`
- `<input type="text">`
- `<input type="time">`
- `<input type="url">`
- `<input type="week">`

Input Type Submit

`<input type="submit">` defines a button for **submitting** form data to a **form-handler**.
The form-handler is typically a server page with a script for processing input data.
The form-handler is specified in the form's `action` attribute:

Example:
```
<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>
```

Input Type Reset

`<input type="reset">` defines a **reset button** that will reset all form values to their default values

Following is a list of all types of <input> element of HTML.

type=" "	Description
text	Defines a one-line text input field
password	Defines a one-line password input field
submit	Defines a submit button to submit the form to server
reset	Defines a reset button to reset all values in the form.
radio	Defines a radio button which allows select one option.
checkbox	Defines checkboxes which allow select multiple options form.
button	Defines a simple push button, which can be programmed to perform a task on an event.
file	Defines to select the file from device storage.
image	Defines a graphical submit button.

HTML5 added new types on <input> element. Following is the list of types of elements of HTML5

type=" "	Description
color	Defines an input field with a specific color.
date	Defines an input field for selection of date.
datetime-local	Defines an input field for entering a date without time zone.
email	Defines an input field for entering an email address.
month	Defines a control with month and year, without time zone.
number	Defines an input field to enter a number.
url	Defines a field for entering URL
week	Defines a field to enter the date with week-year, without time zone.
search	Defines a single line text field for entering a search string.
tel	Defines an input field for entering the telephone number.