

1.20821 Information Technology Concepts

7.0 HTML Introduction

HTML is the standard markup language for creating Web pages.

7.1 What is HTML?

- HTML stands for Hyper Text Markup Language
- HTML is the standard markup language for creating Web pages
- HTML describes the structure of a Web page
- HTML consists of a series of elements
- HTML elements tell the browser how to display the content
- HTML elements label pieces of content such as "this is a heading", "this is a paragraph", "this is a link", etc.

A Simple HTML Document

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

The above Example Explained line by line

- The `<!DOCTYPE html>` declaration defines that this document is an HTML5 document
- The `<html>` element is the root element of an HTML page

- The `<head>` element contains meta information about the HTML page
- The `<title>` element specifies a title for the HTML page (which is shown in the browser's title bar or in the page's tab)
- The `<body>` element defines the document's body, and is a container for all the visible contents, such as headings, paragraphs, images, hyperlinks, tables, lists, etc.
- The `<h1>` element defines a large heading
- The `<p>` element defines a paragraph

7.2 What is an HTML Element?

A start tag, some content, and an end tag define an HTML element:

`<tagname>` Content goes here... `</tagname>`

The HTML **element** is everything from the start tag to the end tag:

`<h1>`My First Heading`</h1>`

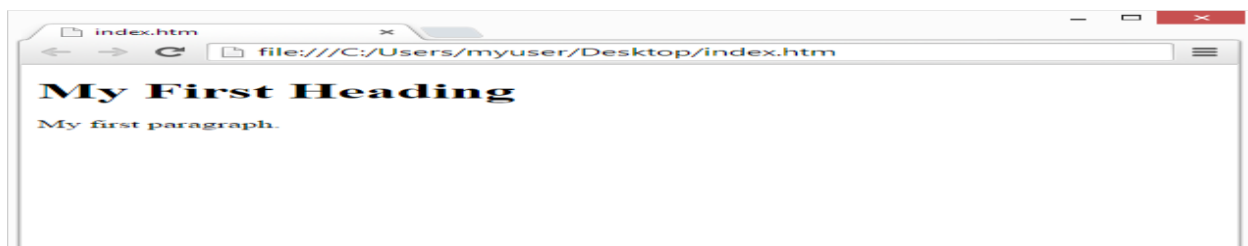
`<p>`My first paragraph.`</p>`

Note: Some HTML elements have no content (like the `
` element). These elements are called empty elements. Empty elements do not have an end tag!

7.2 Web Browsers

The purpose of a web browser (Chrome, Edge, Firefox, Safari) is to read HTML documents and display them correctly.

A browser does not display the HTML tags, but uses them to determine how to display the document:



7.3 HTML Links

HTML links are defined with the `<a>` tag:

e.g `Click the Link`

The link's destination is specified in the `href` attribute.

Attributes are used to provide additional information about HTML elements.

7.4 HTML Images

HTML images are defined with the `` tag.

The source file (`src`), alternative text (`alt`), `width`, and `height` are provided as attributes:

e.g ``

7.5 Nested HTML Elements

HTML elements can be nested (this means that elements can contain other elements).

All HTML documents consist of nested HTML elements.

The following example contains four HTML elements (`<html>`, `<body>`, `<h1>` and `<p>`):

Example:

```
<!DOCTYPE html>
<html>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

7.6 HTML Attributes

- All HTML elements can have **attributes**
- Attributes provide **additional information** about elements
- Attributes are always specified in **the start tag**
- Attributes usually come in name/value pairs like: **name="value"**

Examples:

The href Attribute:

The `<a>` tag defines a hyperlink. The `href` attribute specifies the URL of the page the link goes to:

```
<a href="https://www.itc.com">Visit W3Schools</a>
```

The src Attribute

The `` tag is used to embed an image in an HTML page. The `src` attribute specifies the path to the image to be displayed:

```

```

The width and height Attributes

The `` tag should also contain the `width` and `height` attributes, which specify the width and height of the image (in pixels):

```

```

7.7 HTML Styles

The HTML `style` attribute is used to add styles to an element, such as color, font, size, and more.

Example:

I am Red

I am Blue

I am Big

The HTML Style Attribute

Setting the style of an HTML element, can be done with the `style` attribute.

The HTML `style` attribute has the following syntax:

```
<tagname style="property:value;">
```

e.g

Set the background color for a page to powderblue:

```
<body style="background-color:maroon;">
```

```
<h1>This is a heading</h1>
```

```
<p>This is a paragraph.</p>
```

```
</body>
```

Some common Style attributes:

- Use the `style` attribute for styling HTML elements
- Use `background-color` for background color
- Use `color` for text colors
- Use `font-family` for text fonts
- Use `font-size` for text sizes
- Use `text-align` for text alignment

7.7 HTML Formatting

Formatting elements were designed to display special types of text:

- `` - Bold text
- `` - Important text
- `<i>` - Italic text
- `` - Emphasized text
- `<mark>` - Marked text
- `<small>` - Smaller text
- `` - Deleted text
- `<ins>` - Inserted text
- `<sub>` - Subscript text
- `<sup>` - Superscript text

HTML `` and `` Elements

The HTML `` element defines bold text, without any extra importance.

Example:

```
<b>This text is bold</b>
```

The HTML `` element defines text with strong importance. The content inside is typically displayed in bold.

Example:

```
<strong>This text is important!</strong>
```

7.8 HTML Styles - CSS

CSS stands for Cascading Style Sheets.

CSS saves a lot of work. It can control the layout of multiple web pages all at once.

What is CSS?

Cascading Style Sheets (CSS) is used to format the layout of a webpage.

With CSS, you can control the color, font, the size of text, the spacing between elements, how elements are positioned and laid out, what background images or background colors are to be used, different displays for different devices and screen sizes, and much more!

Using CSS

CSS can be added to HTML documents in 3 ways:

- **Inline** - by using the `style` attribute inside HTML elements
- **Internal** - by using a `<style>` element in the `<head>` section
- **External** - by using a `<link>` element to link to an external CSS file

The most common way to add CSS, is to keep the styles in external CSS files. However, in this tutorial we will use inline and internal styles, because this is easier to demonstrate, and easier for you to try it yourself.

Inline CSS

An inline CSS is used to apply a unique style to a single HTML element.

An inline CSS uses the `style` attribute of an HTML element.

The following example sets the text color of the `<h1>` element to blue, and the text color of the `<p>` element to red:

e.g

```
<h1 style="color:blue;">A Blue Heading</h1>
```

```
<p style="color:red;">A red paragraph.</p>
```

Inline CSS

An inline CSS is used to apply a unique style to a single HTML element.

An inline CSS uses the **style** attribute of an HTML element.

The following example sets the text color of the **<h1>** element to blue, and the text color of the **<p>** element to red:

e.g

```
<h1 style="color:blue;">A Blue Heading</h1>
```

```
<p style="color:red;">A red paragraph.</p>
```

External CSS

An external style sheet is used to define the style for many HTML pages.

To use an external style sheet, add a link to it in the **<head>** section of each HTML page:

e.g

```
<!DOCTYPE html>
<html>
<head>
  <link rel="stylesheet" href="styles.css">
</head>
<body>
<h1>This is my heading</h1>
<p>This is a my paragraph.</p>

</body>
</html>
```

The external style sheet can be written in any text editor. The file must not contain any HTML code, and must be saved with a .css extension.

Here is what the "styles.css" file looks like:

"styles.css":

```
body {  
  background-color: powderblue;  
}  
h1 {  
  color: blue;  
}  
p {  
  color: red;  
}
```

7.8 HTML Tables

A table in HTML consists of table cells inside rows and columns.

Example

A simple HTML table below:

```
<table>  
  <tr>  
    <th>School</th>  
    <th>Division</th>  
    <th>Strand</th>  
  </tr>  
  <tr>  
    <td>SNPS</td>  
    <td>Biology</td>  
    <td>Plant Biology</td>  
  </tr>  
  <tr>  
    <td>SNPS</td>  
    <td>MSCS</td>  
    <td>Statistics</td>  
  </tr>  
</table>
```

You can have as many rows as you like in a table; just make sure that the number of cells are the same in each row.

Table Cells

Each table cell is defined by a `<td>` and a `</td>` tag.

Everything between `<td>` and `</td>` are the content of the table cell.

Example

```
<table>
  <tr>
    <td>Emil</td>
    <td>Tobias</td>
    <td>Linus</td>
  </tr>
</table>
```

Table Rows

Each table row starts with a `<tr>` and ends with a `</tr>` tag.

Example

```
<table>
  <tr>
    <td>Emil</td>
    <td>John</td>
    <td>Linus</td>
  </tr>
  <tr>
    <td>16</td>
    <td>14</td>
    <td>10</td>
  </tr>
</table>
```

Note: You can have as many rows as you like in a table; just make sure that the number of cells are the same in each row.

Table Headers

Sometimes you want your cells to be table header cells. In those cases, use the `<th>` tag instead of the `<td>` tag:

th stands for table header

Example

Let the first row be table header cells:

```

<table>
  <tr>
    <th>Country</th>
    <th>Province</th>
    <th>District</th>
  </tr>
  <tr>
    <td>PNG</td>
    <td>Milne Bay</td>
    <td>Kiriwina-Goodenough</td>
  </tr>
  <tr>
    <td>PNG</td>
    <td>Hela</td>
    <td>Tari-Pori</td>
  </tr>
</table>

```

Table borders

HTML tables can have borders of different styles and shapes.

HTML Tables Sizes

HTML tables can have different sizes for each column, row or the entire table.

Use the style attribute with the width or height properties to specify the size of a table, row or column.

e.g

```

<table style="width:100%" "border:1px black">
  <tr>
    <th style="width:70%">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>

```

```
</tr>
</table>
```

7.9 HTML Classes

The HTML class attribute is used to specify a class for an HTML element. Multiple HTML elements can share the same class.

Using the class Attribute

The class attribute is often used to point to a class name in a style sheet. It can also be used by a JavaScript to access and manipulate elements with the specific class name.

In the following example, we have three `<div>` elements with a class attribute with the value of "Dept". All of the three `<div>` elements will be styled equally according to the .Dept style definition in the head section:

The `class` attribute is often used to point to a class name in a style sheet. It can also be used by a JavaScript to access and manipulate elements with the specific class name.

```
<!DOCTYPE html>
<html>
  <head>
    <style>
      .Dept {
        background-color: tomato;
        color: white;
        border: 2px solid black;
        margin: 20px;
        padding: 20px;
      }
    </style>
  </head>

  <body>
    <div class="Dept">
      <h2>Physics</h2>
      <p>Physics Department.</p>
    </div>

    <div class="Dept">
      <h2>Biology</h2>
      <p>Biology Department.</p>
    </div>
```

```

<div class="Dept">
  <h2>MSCS</h2>
  <p>The Mathematics, Statistics and Computer Sciences Department</p>
</div>

</body>
</html>

```

7. 10 HTML ID Attribute

The HTML id attribute is used to specify a unique id for an HTML element.

You cannot have more than one element with the same id in an HTML document.

The id attribute specifies a unique id for an HTML element. The value of the id attribute must be unique within the HTML document.

The id attribute is used to point to a specific style declaration in a style sheet. It is also used by JavaScript to access and manipulate the element with the specific id.

The syntax for id is: write a hash character (#), followed by an id name. Then, define the CSS properties within curly braces {}.

In the following example we have an <h1> element that points to the id name "myHeader". This <h1> element will be styled according to the #myHeader style definition in the head section:

```

<!DOCTYPE html>
<html>
<head>
<style>
#myHeader {
  background-color: lightblue;
  color: black;
  padding: 40px;
  text-align: center;
}
</style>
</head>
<body>

<h1 id="myHeader">My Header</h1>

</body>
</html>

```

Note: The id name is case sensitive!

Note: The id name must contain at least one character, cannot start with a number, and must not contain whitespaces (spaces, tabs, etc.).

Difference Between Class and ID

A class name can be used by multiple HTML elements, while an id name must only be used by one HTML element within the page:

```
<!DOCTYPE html>
<html>
  <head>

    <style>
      /* Style the element with the id "myHeader" */
      #myHeader {
        background-color: lightblue;
        color: black;
        padding: 40px;
        text-align: center;
      }

      /* Style all elements with the class name "Dept" */
      .Dept {
        background-color: tomato;
        color: white;
        padding: 10px;
      }
    </style>
  </head>
  <!-- An element with a unique id -->
  <h1 id="myHeader">SNPS Departments</h1>

  <!-- Multiple elements with same class -->
  <h2 class="Dept">Physics</h2>
  <p>Physics Department.</p>

  <h2 class="city">Biology</h2>
  <p>Biology Department.</p>

  <h2 class="city">MSCS</h2>
  <p>The Mathematics, Statistics & Computer Science Department</p>
</body>
</html>
```