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Korea Software HRD Center

HTML

(HyperText Markup Language)

Prepared By: Web Team

Objective of HTML

1. Understand syntax, usage, and elements.
2. How to design structure, and layout of a website.
3. What others that **HTML** can do?
4. What we can integrate with **HTML**?

HTML Introduction

1. What is HTML?

- **HTML** stands for **H**yper **T**ext **M**arkup **L**anguage.
- HTML is the standard markup language for creating Web pages.
- HTML is a language for describing web pages.
- HTML markup language is a set of markup **tags**.
- HTML documents (**web pages**) contain HTML **tags** and plain **text**.

HTML Introduction (Cont.)

2. HTML Tags

- **HTML tags** are keywords (tag names) surrounded by **angle brackets** like **<**html**>**
- HTML tags normally **come in pairs** like and
- **Start** and **end tags** are also called **opening tags** and **closing tags**

<tagname>content</tagname>

- **Note:**
  - The ***<!DOCTYPE>*** declaration is not an HTML tag.

HTML Introduction (Cont.)

3. HTML Page Structure

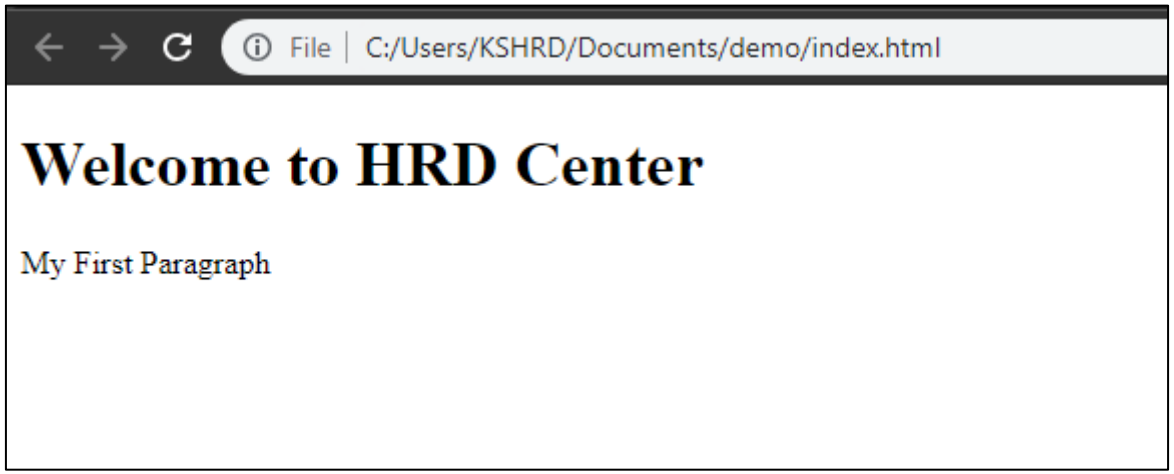
- Below is a visualization of an HTML page structure:

```
<!DOCTYPE html>
<html>
    <head>
        <title>Index Page</title>
    </head>
    <body>
        <h1> Welcome to HRD Center </h1>
        <p> My first paragraph </p>
    </body>
</html>
```

HTML Introduction (Cont.)

4. Web Browsers

- The purpose of a web browser (such as Google Chrome, brave, Arc, Firefox, Safari) is to read HTML documents and display them as web pages.



HTML Elements

HTML documents are defined by **HTML elements**.

1. What is HTML Elements?

- An **HTML element** is everything from the ***start tag (opening tag)*** to the ***end tag (closing tag)***.

Start Tag	Content	End Tag
	This is paragraph content.	
	This is a link	

HTML Elements (Cont.)

2. Nested HTML Elements

- Most HTML elements can be **nested** (can contain other HTML elements).
- HTML documents consist of nested HTML elements.
- Example:

```
<!DOCTYPE html>
<html>
    <body>
        <p>This is my first paragraph.</p>
    </body>
</html>
```

HTML Elements (Cont.)

3. Don’t Forget the End Tag

- Some HTML elements might display correctly even if you forget the end tag.
- Example: **`<p> This is my first paragraph.`**
  - The example above works in most browsers, because the closing tag is considered **optional**.

4. Empty Elements

- HTML elements with no content are called **empty elements**.
- Example: *
* is an empty element without a closing tag (the *
* tag defines a line break).

HTML Attributes

Attributes provide **additional information** about HTML elements.

1. What are HTML Attributes?

- Attributes come in **name/value** pairs like: **name = " value "**
- Example
  - **HTML links** are defined with the ***<a>*** tag.
  - The **link address** is specified in the **href** attribute:

```
<a href="http://www.w3schools.com">This is a link</a>
```

HTML Attributes (Cont.)

2. Some HTML Attributes

Attribute	Description
alt	Specifies an alternative text for an image
disabled	Specifies that an input element should be disabled
href	Specifies the URL (web address) for a link
id	Specifies a unique id for an element
src	Specifies the URL (web address) for an image
style	Specifies an inline CSS style for an element
title	Specifies extra information about an element (displayed as a tool tip)

HTML Headings

Headings are important in HTML documents.

1. HTML Headings

- Headings are defined with the *<h1>* to *<h6>* tags.
  - *<h1>* defines the *most important* heading.
  - *<h6>* defines the *least important* heading.
- Example

```
<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>
```

HTML Headings (Cont.)

Note: Browsers automatically add some empty space (a margin)

2. Headings Are Important

- Use HTML headings for headings only. Don't use headings to make text **big** or **bold**.
- Search engines use your headings to index the structure and content of your web pages.
- Since users may skim your pages by its headings, it is important to use headings to show the document structure.
- **h1** headings should be used as main headings, followed by **h2** headings, then the less important **h3** headings, and so on.

HTML Paragraph

Paragraphs are defined with the ***<p>*** tag.

1. HTML Paragraph

- Example

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

- **Note:**
  - A paragraph always starts on a new line
  - Browsers automatically add some white space (a margin) before and after a paragraph.

HTML Paragraph (Cont.)

2. HTML Display

- With HTML, you cannot change the display by adding extra spaces or extra lines in your HTML code.
- The browser will automatically remove any extra spaces and lines when the page is displayed:
- Example

HTML Code	Result
`<p>This is a  paragraph.  </p>`	This is a paragraph.

HTML Paragraph (Cont.)

3. HTML Line Breaks

- Use the *
* tag if you want a line break (a new line) without starting a new paragraph:
- Example

HTML Code	Result
`<p> This is   a para   graph with line breaks </p>`	*This is* *a para* *graph with line breaks*

HTML Formatting Tags

- HTML uses tags like *<b>* and *<i>* for formatting output, like bold or italic text.

  These HTML tags are called **formatting tags**.

Tag	Description
<b>	Defines bold text
	Defines emphasized text
<i>	Defines italic text
<small>	Defines smaller text
	Defines important text

Tag	Description
<sub>	Defines subscripted text
<sup>	Defines superscripted text
<ins>	Defines inserted text
<del>	Defines deleted text
<mark>	Defines marked/highlighted text

HTML Link

1. HTML Hyperlinks (Links)

- The HTML ***<a>*** tag defines a **hyperlink**.
- A **hyperlink** (or **link**) is a word, group of words, or image that you can click on to jump to another document.
- The most important attribute of the ***<a>*** element is the **href** attribute, which indicates the link's destination.
- Example

```
<a href="http://www.w3schools.com">Visit W3Schools</a>
```

  - which will display like this: Visit W3Schools

HTML Link (Cont.)

1. HTML Hyperlinks (Links) (Cont.)

- By default, links will appear as follows in all browsers:
  - An **unvisited link** is underlined and **blue**

    Visit W3Schools
  - A **visited link** is underlined and **purple**

    Visit W3Schools
  - An **active link** is underlined and **red**

    Visit W3Schools

HTML Link (Cont.)

2. HTML Links - The target Attribute

- The target attribute specifies where to open the linked document.
- The example below will open the linked document in a new browser window or a new tab:
- Example

```
<a href="http://www.w3schools.com" target="_blank">
    Visit W3Schools
</a>
```

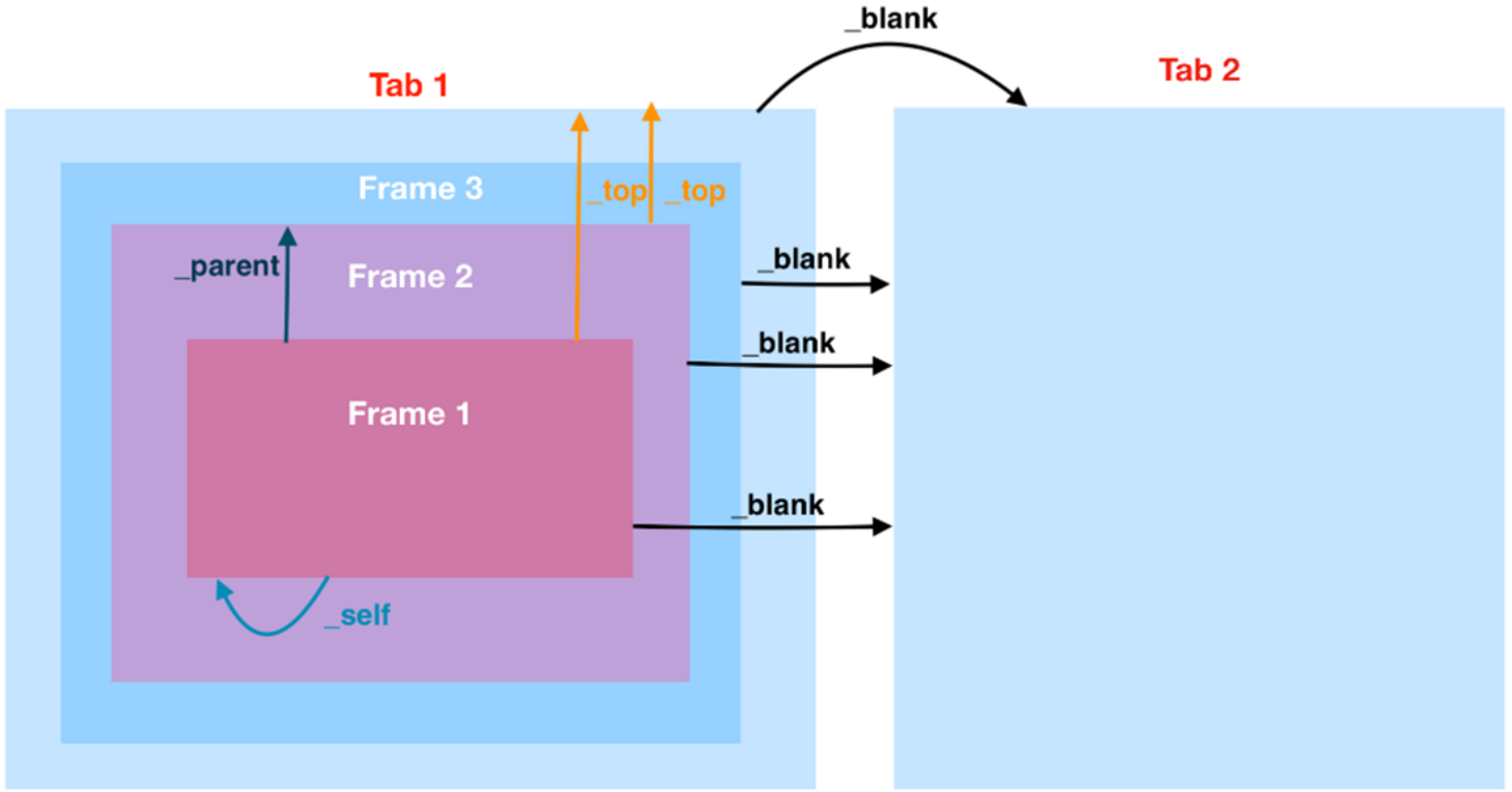
HTML Link (Cont.)

2. HTML Links - The target Attribute (Cont.)

Value	Description
_blank	Load in a new tab
_self (default)	Load in the same window as it was clicked
_parent (iframe)	Load in the parent frameset
_top (iframe)	Load in the full body of the window
_new	Load in a new window first time
framename (iframe)	Load in a named frame

HTML Link (Cont.)

2. HTML Links - The target Attribute (Cont.)



HTML Link (Cont.)

3. HTML Links - The id Attribute

- The id attribute can be used to create a bookmark inside an HTML document.
- **Tip**: Bookmarks are not displayed in any special way. They are invisible to the reader.
- Example
  - An anchor with an id inside an HTML document:

```
<a id="tips">Useful Tips Section</a>
```

  - Create a link to the "Useful Tips Section" inside the same document:

```
<a href="#tips">Visit the Useful Tips Section</a>
```

HTML Head

The HTML <head> Element

- Elements inside *<head>* can include scripts, instruct the browser where to find style sheets, provide meta information, and more.
- The following tags can be added to the head section:
  - *<title></title>*
  - *<style></style>*
  - *<meta></meta>*
  - *<link></link>*
  - *<script></script>*

HTML Head (Cont.)

1. The HTML <title> Element

- The *<title>* tag defines the title of the document.
- The *<title>* element:
  - defines a title in the browser title bar
  - displays a title for the page in search-engine results.
- Example:

```
<head>
    <title>Title of the document</title>
</head>
```

HTML Head (Cont.)

2. The HTML <meta> Element

- **Meta** elements are typically used to specify
  - character set
  - page description,
  - keywords,
  - author of the document,
  - last modified,
  - and other metadata.
- *<meta>* tags always go inside the *<head>* element.

HTML Head (Cont.)

2. The HTML <meta> Element (Cont.)

- *<meta>* Tags - Examples of Use
  - Define **keywords for search engines**:

```
<meta name="keywords" content="HTML, CSS, XML, XHTML, JavaScript">
```

  - Define **a description of your web page**:

```
<meta name="description" content="Free Web tutorials on HTML and
CSS">
```

  - Define **the author of a page**:

```
<meta name="author" content=”HRD Center">
```

HTML Head (Cont.)

3. The HTML <script> Element

- The *<script>* tag is used to define a client-side script, such as a JavaScript.
- Example:

```
<head>
      <script>……….</script>
</head>
<body>
      <script>……….</script>
</body>
```

HTML Image

The <img> Tag

- The *<img>* tag is empty, which means that it contains attributes only, and has no closing tag.

The src Attribute

- To display an image on a page, you need to use the **src** attribute. src stands for "source".

The alt Attribute

- The required **alt** attribute specifies an alternate text for an image, if the image cannot be displayed.

```
<img src="url" alt="some_text">
```

HTML List

The most common HTML lists are **ordered** and **unordered** lists.

1. HTML Unordered Lists

- An unordered list starts with the *<ul>* tag. Each list item starts with the *<li>* tag.
- The list items are marked with bullets (typically small black circles).
- Example:

HTML Code	Result

`<ul>`
`  <li>Coffee</li>`
`  <li>Milk</li>`
`</ul>`
	• Coffee
	• Milk

HTML List (Cont.)

2. HTML Ordered Lists

- An ordered list starts with the *<ol>* tag. Each list item starts with the *<li>* tag.
- The list items are marked with numbers.
- Example:

HTML Code	Result

`<ol>`
`  <li>Coffee</li>`
`  <li>Milk</li>`
`</ol>`
	1. Coffee
	2. Milk

HTML List (Cont.)

3. HTML Description Lists

- A description list is a list of terms/names, with a description of each term/name.
- The ***<dl>*** tag
  - defines a description list.
  - is used in conjunction with ***<dt>*** and ***<dd>***.
- The ***<dt>*** tag defines terms/names.
- The ***<dd>*** tag describes each term/name.

HTML List (Cont.)

3. HTML Description Lists (Cont.)

- Example:

HTML Code	Result
<dl> <dt>Coffee</dt> <dd>- black hot drink</dd> <dt>Milk</dt> <dd>- white cold drink</dd> </dl>	Coffee - black hot drink Milk - white cold drink

HTML Table

1. HTML Tables

- Tables are defined with the *<table></table>* tags.
- A **table** is divided into **rows** with the *<tr>* tag. (tr stands for table row)
- A **row** is divided into
  - **headings** with the *<th>* tag. (th stands for table heading)
  - **data cells** with the *<td>* tag. (td stands for table data)
    - are the data containers in the table.
    - can contain all sorts of HTML elements like text, images, lists, other tables, etc.
- The **width** of a table can be defined using CSS.

HTML Table (Cont.)

2. An HTML Table with a Border Attribute

- The table will be displayed without borders if you don't specify a border.
- Example:

HTML Code	Result
<table> <tr> <td>Smith</td> <td>50</td> </tr> <tr> <td>Jackson</td> <td>94</td> </tr> </table>	Smith 50 Jackson 94

HTML Table (Cont.)

2. An HTML Table with a Border Attribute (Cont.)

- A **border** can be added using the border attribute.
- Example:

HTML Code	Result
<table border="1"> <tr> <td>Smith</td> <td>50</td> </tr> <tr> <td>Jackson</td> <td>94</td> </tr> </table>	<table border="1"><tr><td>Smith</td><td>50</td></tr><tr><td>Jackson</td><td>94</td></tr></table>

HTML Table (Cont.)

3. An HTML Table with Cell Span Many Columns

- To make a cell span more than one column, use the **colspan** attribute.
- Example:

```
<th colspan="2">Telephone</th>
```

3. An HTML Table with Cell Span Many Rows

- To make a cell span more than one row, use the **rowspan** attribute.
- Example:

```
<th rowspan="2">Telephone:</th>
```

HTML Block and Inline

Most HTML elements are defined as **block level** elements or as **inline** elements.

1. **HTML Block Elements**
   - **Block level elements** normally start (and end) with a new line when displayed in a browser.
   - Example: `<h1>, <p>, <ul>, <table>`

1. **HTML Inline Elements**
   - **Inline elements** are normally displayed without starting a new line.
   - Example: `<b>, <td>, <a>, <img>`

HTML Block and Inline (Cont.)

HTML elements can be grouped together with * * and **

3. The HTML Element

- The HTML * * element is a **block level** element that can be used as a **container** for grouping other HTML elements.
- The * * element has no special meaning. Except that, because it is a block level element, the browser will display a line break before and after it.
- Example:

```
<div>
    <h2>London</h2>
    <p>London is the capital city of England. </
    p>
</div>
```

HTML Block and Inline (Cont.)

4. The HTML Element

- The HTML ****** element is an inline element that can be used as a container for text.
- An **inline element** does not start on a new line and it only takes up as much width as necessary
- Example:

```
<h1>My <span style="color : red">Important</span> Heading</h1>
```

HTML Semantic and non-semantic Elements

1. Semantic Elements in HTML

- Semantic HTML elements are those that clearly describe their meaning in a human and machine-readable way.
- The benefits of semantic elements
  - Greater accessibility ꞉ Assistive technologies (e.g, screen readers) can understand the structure and purpose of the content.
  - SEO Benefits ꞉ Search engines use semantic tags to better understand and index web content
  - Standardized Structure ꞉ Promotes best practices for web development.

HTML Semantic and non-semantic Elements (Cont.)

1. Semantic Elements in HTML (Cont.)

Tag	Description
<article>	Defines independent, self-contained content
<aside>	Defines content aside from the page content
<details>	Defines additional details that the user can view or hide
<figcaption>	Defines a caption for a <figure> element
<time>	Defines a date/time
<summary>	Defines a visible heading for a <details> element

HTML Semantic and non-semantic Elements (Cont.)

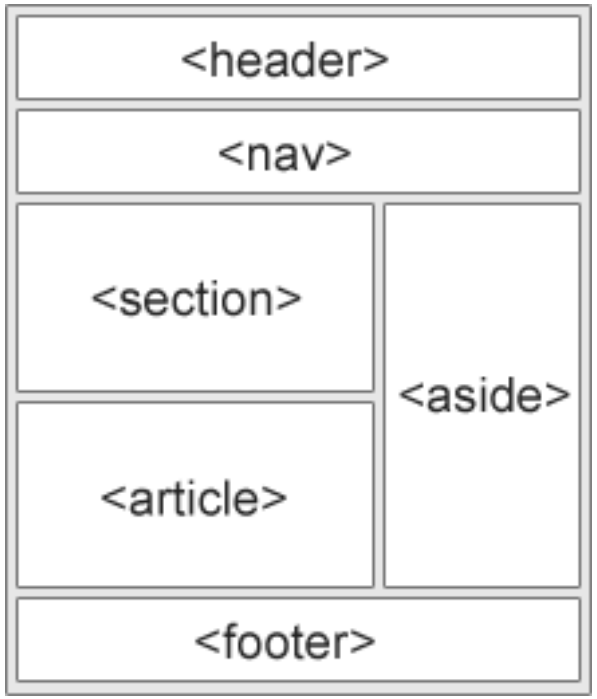
2. Non-Semantic Elements in HTML

- The Non-Semantic Element tells nothing about its content.
- The benefits of non-semantic elements
  - Using when there no semantic elements that can do the job.
  - Useful as hooks for applying CSS and JavaScript.
- Non semantic elements : * * and **.

HTML Layout

1. HTML Layout Elements

HTML has several semantic elements that define the different parts of a web page:

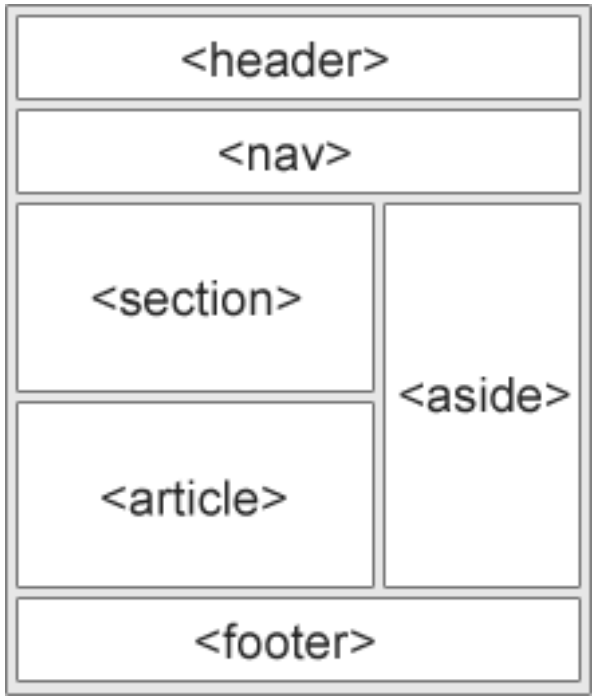


Tag	Description
<header>	Defines a header for a document or a section
<nav>	Defines a set of navigation links
<section>	Defines a section in a document
<article>	Defines an independent, self-contained content

HTML Layout (Cont.)

1. HTML Layout Elements (Cont.)

HTML has several semantic elements that define the different parts of a web page:



Tag	Description
<aside>	Defines content aside from the content (like a sidebar)
<footer>	Defines a footer for a document or a section
<details>	Defines additional details that the user can open and close on demand
<summary>	Defines a heading for the <details> element

HTML Layout (Cont.)

2. HTML Layout Techniques

- There are four different techniques to create multicolumn layouts. Each technique has its pros and cons:
  - CSS framework
  - CSS float property
  - CSS flexbox
  - CSS grid

HTML Layout (Cont.)

HTML Forms

1. HTML Forms

- **HTML Forms** are used to collect different kinds of **user input** and **pass data** to a server.
- An HTML form can contain input elements like text fields, password field, checkboxes, radio-buttons, submit buttons and more. A **form** can also contain select lists, textarea, fieldset, legend, and label elements.
- The ***<form>*** tag is used to create an HTML form:

```
<form>
        .
        input elements
        .
</form>
```

HTML Forms (Cont.)

2. HTML Forms - The Input Element

- The *<input>* element is used to select user information.
- An *<input>* element can vary in many ways, depending on the *type* attribute.
- An *<input>* element can be *type*
  - text field,
  - password,
  - checkbox,
  - radio button,
  - submit button, and more.

HTML Forms (Cont.)

2. HTML Forms - The Input Element (Cont.)

a. Text Fields

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

```
<form>
    First name: <input type="text" name="firstname"><br>
    Last name: <input type="text" name="lastname">
</form>
```

- **Note:**
  - The form itself is not visible.
  - The default width of a text field is 20 characters.

HTML Forms (Cont.)

2. HTML Forms - The Input Element (Cont.)

b. Password Field

- ***<input type="password">*** defines a password field.

```
<form>
    Password: <input type="password" name="pwd">
</form>
```

- **Note:**
  - The characters in a password field are masked (shown as asterisks or circles).

HTML Forms (Cont.)

2. HTML Forms - The Input Element (Cont.)

c. Radio Buttons

- *<input type="radio">* defines a radio button.

```
<form>
    <input type="radio" name="sex" value="male">Male<br>
    <input type="radio" name="sex" value="female">Female
</form>
```

- **Note:**
  - **Radio buttons** let a user select **ONLY ONE** of a limited number of choices.

HTML Forms (Cont.)

2. HTML Forms - The Input Element (Cont.)

d. Checkboxes

- ***<input type="checkbox">*** defines a checkbox.

```
<form>
    <input type="checkbox" name="vehicle"
    value="Bike">Bike<br>
    <input type="checkbox" name="vehicle" value="Car">Car
</form>
```

- **Note:**
  - **Checkboxes** let a user select **ZERO** or **MORE options** of a limited number of choices.

HTML Forms (Cont.)

2. HTML Forms - The Input Element (Cont.)

e. Submit Button

- ***<input type="submit">*** defines a submit button.

```
<form name="input" action="html_form_action.asp" method="get">
    Username: <input type="text" name="user">
    <input type="submit" value="Submit">
</form>
```

- **Note:**
  - A **submit button** is used to **send form data to a server**.
  - The **data** is sent to the page specified in the form's ***action*** attribute.
  - The file defined in the ***action*** attribute usually does something with the received input.

HTML Iframe

An iframe is used to display a web page within a web page.

1. HTML Iframe - Syntax

Syntax: `<iframe src="URL"></iframe>`

- The HTML *<iframe>* tag specifies an inline frame.
- The *src* attribute defines the URL of the page to embed
- The *URL* points to the location of the separate page.

HTML Iframe (Cont.)

2. Iframe - Set Height and Width

- The ***height*** and ***width*** attributes are used to specify the height and width of the iframe.
- The attribute values
  - are specified in pixels by default
  - but they can also be in percent (like "80%").
- Example:

```
<iframe src=”http://www.w3school.com" width="200" height="200"></
iframe>
```

HTML Iframe (Cont.)

3. Iframe - Remove the Border

- By default, an iframe has a border around it.
- The ***frameborder*** attribute
  - specifies whether or not to display a border around the iframe.
  - set the attribute value to "0" to remove the border
- Example:

```
<iframe src="demo_iframe.htm" frameborder="0"></iframe>
```

HTML Iframe (Cont.)

4. Use iframe as a Target for a Link

- An iframe can be used as the target frame for a link.
- The ***target*** attribute of a link must refer to the ***name*** attribute of the iframe:
  - specifies whether or not to display a border around the iframe.
  - set the attribute value to "0" to remove the border
- Example:

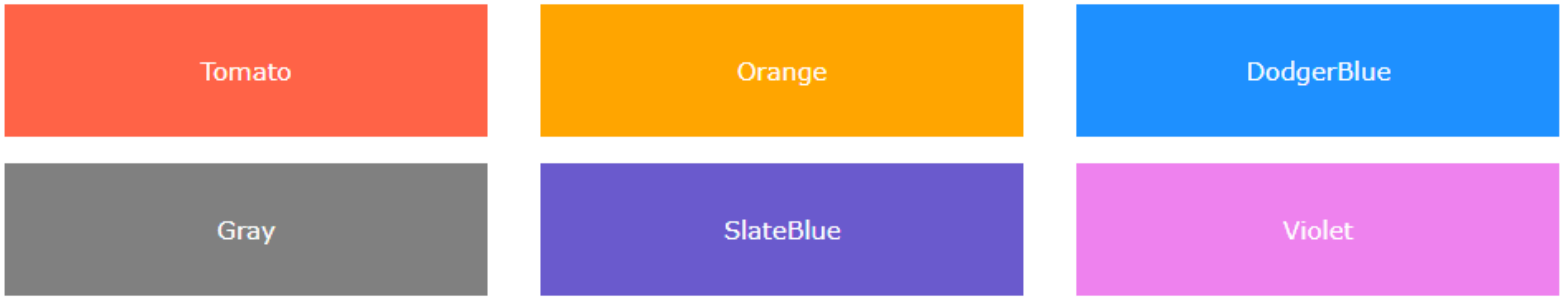
```
<iframe src="demo_iframe.htm" name="iframe_a"></iframe>
<a href="http://www.w3schools.com"
target="iframe_a">W3Schools.com</a>
```

HTML Color

HTML colors are specified with predefined **color names**, or with **color values** (RGB, HEX, or RGBA).

1. Color Names

- In HTML, a color can be specified by using a color name.



- HTML supports 140 standard color names

HTML Color (Cont.)

2. Color Values

- In HTML, colors can also be specified using
  - **RGB** values

```
rgb(255, 99, 71)
```

  - **RGBA** values

```
rgba(255, 99, 71, 0.5)
```

  - **HEX** values

```
#ff6347
```

HTML Color (Cont.)

2. Color Values (Cont.)

a. RGB color values

- An **RGB color** value represents RED, GREEN, and BLUE light sources.
- **Formula**: *rgb(red, green, blue)*

```
rgb(255, 99, 71)
```

- Each parameter (red, green, and blue) defines the intensity of the color with a value between **0** and **255**.

HTML Color (Cont.)

2. Color Values (Cont.)

b. RGBA color values

- An **RGBA color** value is an extension of RGB with an Alpha channel (opacity).
- **Formula**: *rgba(red, green, blue, alpha)*

```
rgba(255, 99, 71, 0.5)
```

- The **alpha parameter** is a number between **0.0** (fully transparent) and **1.0** (not transparent at all).
- Example HTML RGB and RGBA Colors

HTML Color (Cont.)

2. Color Values (Cont.)

c. HEX Color Values

- A **hexadecimal color** is specified with: **#RRGGBB**, where the RR (red), GG (green) and BB (blue) hexadecimal integers.
- **Formula**: ***#rrggbb***

#ff6347

- **Hexadecimal values** between **00** and **ff** (same as decimal 0-255)
- Example hexadecimal color

HTML Entities

1. HTML Character Entities

- Some characters are reserved in HTML.
- If you use the **less than (<)** or **greater than (>)** signs in your text, the browser might mix them with **tags**.
- Reserved characters in HTML must be replaced with entities:
  - **<** (less than) = ***<***
  - **>** (greather than) = ***>***

HTML Entities (Cont.)

1. HTML Character Entities (Cont.)

- **Entity names** or **entity numbers** can be used to display reserved HTML characters.
  - **Entity names** look like this: *&entity_name;*
  - **Entity numbers** look like this: *&#entity_number;*
- Example:
  - To display a less than sign (**<**) we must write: *<* or *<*

HTML Entities (Cont.)

1. HTML Character Entities (Cont.)

- **Note:**
  - The advantage of using an entity name, instead of a number, is that the name is easier to remember.
  - The disadvantage is that browsers may not support all entity names, but the support for numbers is good.
- Details of **HTML Entities**

HTML Entities (Cont.)

2. Some Useful HTML Character Entities

Result	Description	Name	Number
	non-breaking space		
<	less than	&lt;	&#60;
>	greater than	&gt;	&#62;
&	ampersand	&amp;	&#38;
"	double quotation mark	&quot;	&#34;
'	single quotation mark	&apos;	&#39;

HTML Entities (Cont.)

2. Some Useful HTML Character Entities (Cont.)

Result	Description	Name	Number
¢	cent	¢	¢
£	pound	£	£
¥	yen	¥	¥
€	euro	€	€
©	copyright	©	©
®	trademark	®	®

HTML Charset

- To display an HTML page correctly, a web browser must know the **character set** (character encoding) to use.
- The character set is specified in the **<meta>** tag
- Example: `<meta charset="UTF-8">`
- The HTML5 specification encourages web developers to use the **UTF-8** character set.
- **UTF-8** covers almost all of the characters and symbols in the world!
- Reference:
  - HTML Encoding (Character Sets)
  - Full UTF-8 Reference

THANK YOU