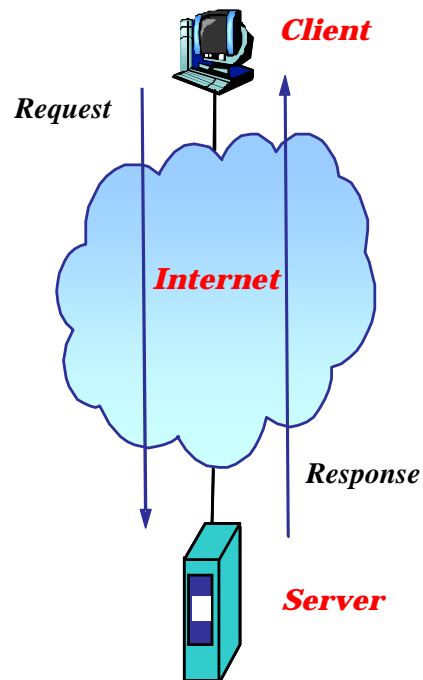


ICS 571: CLIENT-SERVER PROGRAMMING



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Overview of HTML

Dr. Nasir Al-Darwish

Computer Science Department

King Fahd University of Petroleum and Minerals

darwish@kfupm.edu.sa

Outline

- Basic document and tag structure
- Text formatting
- Links
- Lists, Images, Tables
- Styles
- Tags within the <HEAD> element
- Scripts

What is HTML?

- HTML is a language for composing web pages
 - HTML stands for *Hyper Text Markup Language*
 - HTML is a *markup language*
 - A markup language defines a set of markup **tags**
 - The tags **describe** document content
 - HTML documents contain HTML **tags** and plain **text**
 - HTML documents are also called **web pages**

HTML Tags

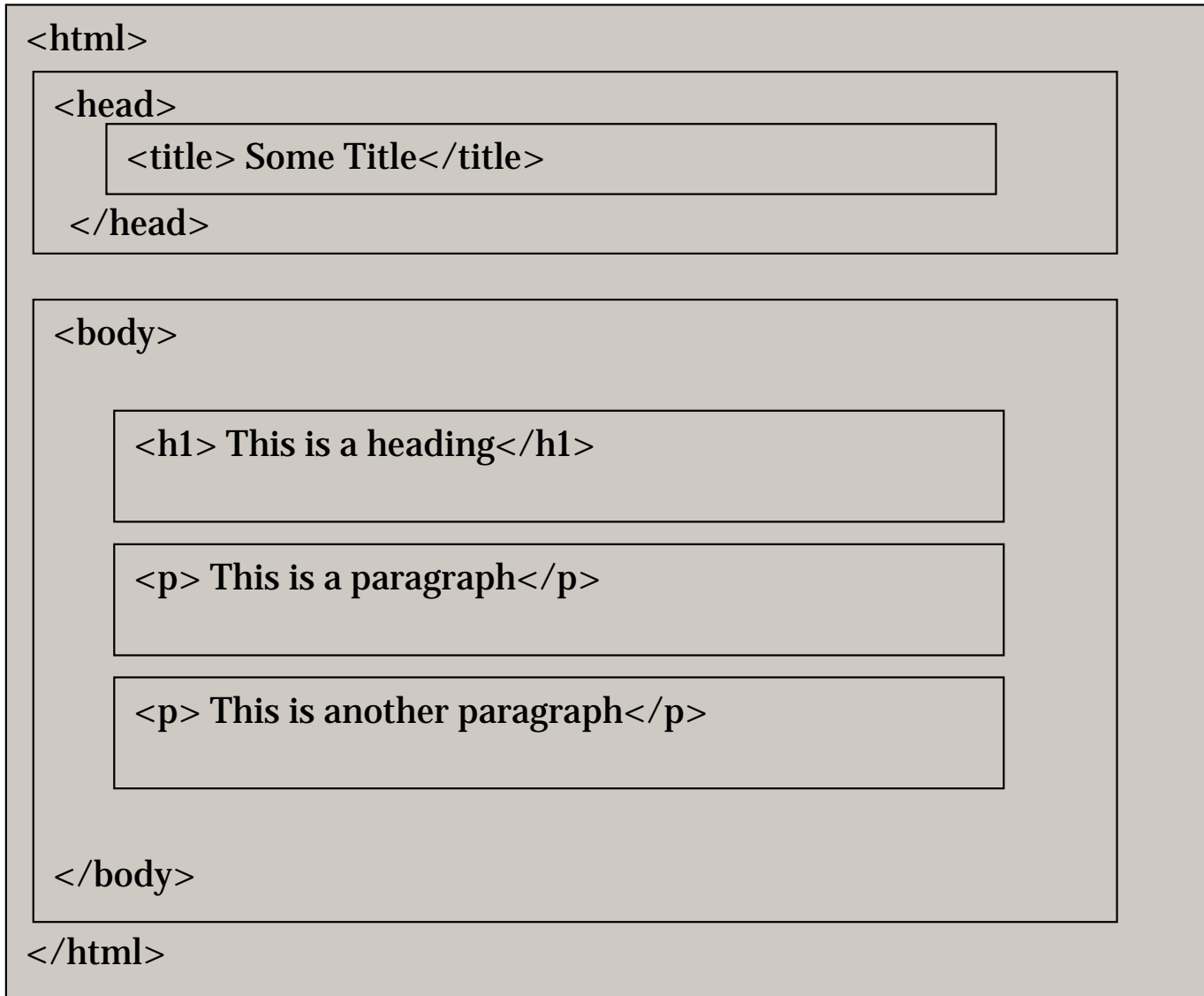
- HTML defines a set of markup tags (simply known as *HTML Tags*)
 - HTML tags are keywords (tag names) surrounded by **angle brackets** like `<html>`
 - HTML tags normally **come in pairs** like `<p>` and `</p>`
 - The general format is:

`<tagname attr1=value1 attr2=value2 >content</tagname>`
 - The first tag in a pair is the **start tag**, the second tag is the **end tag**
 - The end tag is written like the start tag, with a **forward slash** before the tag name
 - Start and end tags are also called **opening tags** and **closing tags**
 - **Note:** HTML tags are not case sensitive

HTML Elements

- Everything between the start tag and the end tag, including the tags
- Example of an HTML Element:
`<p>This is a paragraph.</p>`
- The **element content** is everything between the start and the end tag
- **Note:** The browser only displays (renders) the content part of an HTML element.
- Some HTML elements (e.g., ``, `
`) have **empty content**.
- Most HTML elements have **attributes**.

Basic HTML Page Structure



HTML Versions

Version	Year
HTML	1991
HTML+	1993
HTML 2.0	1995
HTML 3.2	1997
HTML 4.01	1999
XHTML 1.0	2000
HTML 5	2012
XHTML 5	2013

The `<!DOCTYPE>` Declaration

- The `<!DOCTYPE>` declaration helps the browser to display a web page correctly.
- The doctype declaration essentially tells the HTML version used by the html document and it must appear at the start of the document.
- Previous versions of HTML defined many doctypes, and choosing the right one could be tricky. Prior to HTML5, we normally use XHTML Strict 1.0 doctype:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"  
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```

- In HTML5, we only need to use the following doctype declaration:

```
<!DOCTYPE html>
```


HTML5 template

```
<!DOCTYPE html>  
<html lang="en" > <!-- document language -->  
<head>  
    <title>Some Title</title>  
    <meta charset="utf-8"><!-- document character set -->  
</head>  
<body>  
    ...  
</body>  
</html>
```

HTML Links

- HTML links are defined with the <a> (anchor) tag
- The link address is specified in the “href” attribute
- Example:

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

HTML Headings

- HTML headings are defined with the <h1> to <h6> tags.
- <h1> is rendered as largest/boldest, <h6> is rendered as smallest.
- Example:
 - <h1>This is a level 1 heading</h1>
 - <h2>This is a level 2 heading</h2>
 - <h3>This is a level 3 heading</h3>
 - <h4>This is a level 4 heading</h4>
 - <h5>This is a level 5 heading</h5>
 - <h6>This is a level 6 heading</h6>
- 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.
- H1 headings should be used as main headings, followed by H2 headings, then the less important H3 headings, and so on.

HTML Paragraphs

- HTML documents are normally divided into paragraphs
- HTML paragraphs are defined with the `<p>` tag

- Example:

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

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

- Browsers automatically add an empty line before and after a paragraph.
- Browsers often display paragraphs correctly even if the closing tag is missing

What happens if you omit the closing tag

- HTML elements may produce unexpected results and/or errors if you omit the closing tag.
- It is possible (but not guaranteed) that HTML displays correctly even if you omit the closing tag, as in the following example:

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

```
<p>This is another paragraph
```

Nesting of HTML Elements

- Most HTML elements can be nested (can contain other HTML elements).
- **Proper Nesting rule:** *an inner element must be closed before closing the enclosing outer element.*

- Example of invalid nesting:

```
<p><i>Look at <b>this</i></b></p>
```

- An HTML document consists of nested HTML elements.
- Example:

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

Empty HTML Elements

- HTML elements with no content are called empty elements.
- The `
` tag (specifies a line break) is an empty element without a closing tag
- **Tip:** In XHTML, all elements must be closed. Adding a slash inside the start tag, like `
`, is the proper way of closing empty elements in XHTML (and XML).

HTML Attributes

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

attributename="value"
- Attribute values should always be enclosed in quotes.
 - Double style quotes are the most common, but single style quotes are also allowed.

HTML Attributes (cont.)

- Examples of attributes common to many HTML elements (tags):
 - ❑ *Class*: Specifies one or more class names for an element (refers to a class in a style sheet)
 - ❑ *Id*: Specifies a unique id for an element
 - ❑ *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 defined with the `<h1>` to `<h6>` tags.
- `<h1>` defines the most important heading. `<h6>` defines the least important heading.
- 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.
- H1 headings should be used as main headings, followed by H2 headings, then the less important H3 headings, and so on.

HTML Line Breaks

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

```
<p>This is<br>a para<br>graph with line breaks</p>
```
- The `
` element is an empty HTML element and it does not use an end tag

HTML Lines

- The `<hr>` (horizontal rule) tag creates a horizontal line in an HTML page.
- The `<hr>` element is used to show a ***visible line*** as a way of separating content
- Examples:

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

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

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

HTML Comments

- Comments can be inserted into the HTML code to make it more readable and understandable by developer.
- Comments are ignored by the browser and are not displayed.
- An HTML comment starts with `<!--` and ends with `-->`
- Example

```
<!-- This is a comment, the next paragraph is ignored by  
browser
```

```
<p>Hell </p> -->
```

Non-breaking Space

- The browser automatically removes extra spaces and extra lines
 - If you write 10 spaces in your text, the browser will remove 9 of them
- Large or small screens, and resized windows will create different results
- To force the browser to keep spaces, you can do any of the following:
 - Use the * * character entity
 - Use the `<pre>... </pre>` (preformatted) tag; this honors spaces and line breaks

HTML Text Formatting Tags

Tag	Description
	Defines bold text
	Defines emphasized text
<i>	Defines a part of text in an alternate voice or mood
<small>	Defines smaller text
	Defines important text
<sub>	Defines subscripted text
<sup>	Defines superscripted text
<ins>	Defines inserted text
	Defines deleted text

HTML Images

- HTML images are defined using the `` (image) tag
- The image tag has no closing tag
- The filename and the size of the image are specified as attributes
- The ***src*** attribute specifies source URL of the image

- Example:

```

```

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

HTML Ordered Lists

- An ordered list starts with the `` tag and ends with ``
- Each item within the list starts with the `` tag and ends with ``
- The list items are marked with numbers
- Example:

```
<ol>
```

```
  <li>Coffee</li>
```

```
  <li>Milk</li>
```

```
</ol>
```

HTML Unordered Lists

- An unordered list starts with the `` tag and ends with ``
- Each item within the list starts with the `` tag and ends with ``
- The list items are marked with bullets
- Example:

```
<ul>
```

```
  <li>Coffee</li>
```

```
  <li>Milk</li>
```

```
</ul>
```

HTML Definition Lists

- A definition list is a list of items, with a description of each item
- The `<dl>` tag defines a definition list
- `<dt>` defines the item in the list
- `<dd>` describes the item in the list
- Example

```
<dl>
```

```
  <dt>Coffee</dt>
```

```
  <dd>- black hot drink</dd>
```

```
  <dt>Milk</dt>
```

```
  <dd>- white cold drink</dd>
```

```
</dl>
```

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.
- When you move the cursor over a link in a Web page, the arrow will turn into a little hand.
- The most important attribute of the `<a>` element is the `href` attribute, which indicates the link's destination.

```
<a href="url">Link text</a>
```

HTML Links: The ID Attribute

- The ID attribute is used to create a bookmark inside an HTML document.
- 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">Useful Tips</a>
```

Or, create a link to the "Useful Tips Section" from another page:

```
<a href="http://www.w3schools.com/html_links.htm#tips">  
Useful Tips</a>
```

HTML Links: The Target Attribute

- The target attribute specifies where to open the linked document.
- Example to open the target document in a new browser window:

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

<DIV> ELEMENT

- Acts as a container for grouping other HTML elements
 - the browser will display a line break before and after it
- When used together with CSS, the <div> element can be used to set style attributes to large blocks of content.
- Another common use of the <div> element, is for document layout.

 Element

- Acts as a container for text
- When used together with CSS, the element can be used to set style attributes to parts of the text.

<HEAD> Element

- The <head> element is a container for all the head elements.
- The following tags can be added to the head section:
 - <title>
 - <style>
 - <meta>
 - <link>
 - <script>
 - <noscript>
 - <base>

<TITLE> Element

- The <title> tag defines the title of the document.
 - ❑ defines a title in the browser toolbar
 - ❑ provides a title for the page when it is added to favorites
 - ❑ displays a title for the page in search-engine results

<BASE> Element

- The <base> tag specifies a default address or a default target for all links on a page:

```
<head>
```

```
  <base href="http://www.w3schools.com/images/">
```

```
  <base target="_blank">
```

```
</head>
```

<LINK> Element

- The <link> tag defines the relationship between a document and an external resource.
- The <link> tag is most used to link to style sheets:

```
<head>
```

```
  <link rel="stylesheet" type="text/css"  
        href="mystyle.css" >
```

```
</head>
```

<STYLE> ELEMENT

- The <style> tag is used to define style information for an HTML document.
- Inside the <style> element you specify how HTML elements should render in a browser:

```
<head>
```

```
  <style type="text/css">
```

```
    body {background-color:yellow; font-size:10pt; }
```

```
    p {color:blue; font-family:Tahoma; }
```

```
  </style>
```

```
</head>
```

<META> Element

- Metadata is data (information) about data
- The <meta> tag provides metadata about the HTML document
- Metadata will not be displayed on the page, but will be machine parsable.
- Meta elements are typically used to specify encoding character set, page description, keywords, author of the document, last modified
- The metadata can be used by browsers (how to display content or reload page), search engines (keywords), or other web services.

<META> ELEMENT (cont.)

- 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="Hege Refsnes">
```

- Refresh document every 30 seconds:

```
<meta http-equiv="refresh" content="30">
```

Styling with CSS

- CSS was introduced together with HTML 4, to provide a better way to style HTML elements.
- CSS can be added to HTML in the following ways:
 - Inline - using the style **attribute** in HTML elements
 - Internal - using the `<style>` **element** in the `<head>` section
 - External - using an external CSS **file**
- The preferred way to add CSS to HTML, is to put CSS syntax in separate CSS files.

Inline Styles

- Applied to one single occurrence of an element
- The style attribute can contain any CSS property.
- Examples:
 - ❑ `<body style="background-color:yellow;">`
 - ❑ `<h1 style="font-family:verdana;font-size:16t;">A heading</h1>`
 - ❑ `<p style="color:blue;margin-left:20px;">This is a paragraph.</p>`

Internal Style Sheet

- An internal style sheet can be used if one single document has a unique style
- Internal styles are defined in the <head> section

<head>

<style type="text/css">

body { background-color:yellow;}

p {color:blue;}

</style>

</head>

External Style Sheet

- An external style sheet is ideal when the style is applied to many pages
- Each page must link to the style sheet using the `<link>` tag
- The `<link>` tag goes inside the `<head>` section

`<head>`

`<link rel="stylesheet" type="text/css" href="mystyle.css">`

`</head>`

HTML TABLES

- defined with the <table> tag
- A table is divided into rows (with the <tr> tag), and each row is divided into data cells (with the <td> tag)
- A <td> tag can contain text, links, images, lists, forms, other tables, etc.

```
<table border="1">  
<tr>  
<td>row 1, cell 1</td>  
<td>row 1, cell 2</td>  
</tr>  
<tr>  
<td>row 2, cell 1</td>  
<td>row 2, cell 2</td>  
</tr>  
</table>
```

HTML Table Header

- defined with the <th> tag
- All major browsers display the text in the <th> element as bold and centered

```
<table border="1">
<tr>
  <th>Header 1</th>
  <th>Header 2</th>
</tr>
<tr>
  <td>row 1, cell 1</td>
  <td>row 1, cell 2</td>
</tr>
<tr>
  <td>row 2, cell 1</td>
  <td>row 2, cell 2</td>
</tr>
</table>
```

HTML <DIV> AND

- HTML elements can be grouped together with <div> and
- Most HTML elements are defined as **block level** elements or as **inline** elements
- Block level elements normally start (and end) with a new line when displayed in a browser.
 - Examples: <h1>, <p>, , <table>
- Inline elements are normally displayed without starting a new line.
 - Examples: , <td>, <a>,

HTML Forms

- HTML forms are used to pass data from the user to a web server
- An HTML form can contain input elements like text fields, checkboxes, radio-buttons, submit buttons, select lists, textarea, fieldset, legend, and label elements

`<form>`

..

various input elements and submit/reset buttons

..

`</form>`

HTML IFRAME

- An iframe is used to display a web page within a web page.
- 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%")

```
<iframe src="demo_iframe.htm" width="200"  
height="200"></iframe>
```


HTML IFRAME (cont.)

- The frameborder attribute specifies whether or not to display a border around the iframe.

- Set the attribute value to "0" to remove the border:

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

- An iframe can be used as the target frame for a link.

```
<iframe src="demo_iframe.htm" name="iframe_a"></iframe>
```

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

```
</p>
```

<SCRIPT> Element

- Used to define a client-side script, such as a JavaScript
- Example:

```
<script>
```

```
    document.write("Hello World!")
```

```
</script>
```

- The `<script>` element either contains script code or point to an external script file using the ***src*** attribute
- Common uses for JavaScript are image manipulation, form validation, and dynamic changes of content.

<NOSCRIPT> Element

- provide an alternate content for users that have disabled scripts in their browser or have a browser that doesn't support client-side scripting.
- The <noscript> element can contain all the elements that you can find inside the <body> element of a normal HTML page.
- The content inside the <noscript> element will only be displayed if scripts are not supported, or are disabled in the user's browser:

```
<script>
```

```
    document.write("Hello World!")
```

```
</script>
```

```
<noscript>
```

```
    Sorry, your browser does not support JavaScript!
```

```
</noscript>
```

HTML Colors

- HTML colors are defined using a hexadecimal or decimal notation for the combination of Red, Green, and Blue color values (RGB)
- The lowest value that can be given to one of the light sources is zero (in HEX: 00) , the highest value is 255 (in HEX: FF)
- Examples

Black color: #000000 OR rgb(0,0,0)

Red Color: #FF0000 OR rgb(255,0,0)

HTML Color Names

- **Color Names Supported by All Browsers**
- **147 color names are defined in the HTML and CSS color specification**
 - 16 basic colors: aqua, black, blue, fuchsia, gray, green, lime, maroon, navy, olive, purple, red, silver, teal, white, and yellow
 - plus 130 more

HTML Entities

- Some characters are reserved in HTML
- It is not possible to use the less than (<) or greater than (>) signs in your text, because the browser will mix them with tags.
 - To display a less than sign we must write: **<** or **<**
- To actually display reserved characters, we must use character entities in the HTML source code.

&entity_name;

OR

&#entity_number;

HTML Character Entities

Result	Description	Entity Name	Entity Number
	non-breaking space	 	
<	less than	<	<
>	greater than	>	>
&	ampersand	&	&
¢	cent	¢	¢
£	pound	£	£
¥	yen	¥	¥
€	euro	€	€
§	section	§	§
©	copyright	©	©
®	registered trademark	®	®
™	trademark	™	™

URL – Uniform Resource Locator

- A URL is a fancy phrase for a document's web address
 - A URL can be composed of words, such as "w3schools.com",
 - or an Internet Protocol (IP) address: 192.68.20.50.
 - Uses the format:

scheme://host.domain:port/path/filename

URL Encoding

- URLs can only be sent over the Internet using the ASCII character-set.
- Since URLs often contain characters outside the ASCII set, the URL has to be converted into a valid ASCII format.
- URL encoding converts characters into a format that can be transmitted over the Internet.
- URL encoding replaces non ASCII characters with a "%" followed by two hexadecimal digits.
- URLs cannot contain spaces. URL encoding normally replaces a space with a + sign.

URL Encoding (cont.)

Character	URL-encoding
Space	+
€	%80
£	%A3
©	%A9
®	%AE
À	%C0
Á	%C1
Â	%C2
Ã	%C3
Ä	%C4
Å	%C5

XHTML

- Many pages on the internet contain "bad" HTML.
 - No closing tag
- XHTML is HTML that complies with XML rules
- XML is a markup language where documents must be marked up correctly and "well-formed"
- XHTML is a stricter and cleaner version of HTML 4.01
- XHTML stands for **EX**tensible **H**yperText **M**arkup **L**anguage
- XHTML is supported by all major browsers

Differences Between XHTML and HTML

- Document Structure
 - XHTML DOCTYPE is **mandatory**
 - The XML namespace attribute in <html> is **mandatory**
 - <html>, <head>, <title>, and <body> is **mandatory**
- XHTML Elements
 - XHTML elements must be **properly nested**
 - XHTML elements must always be **closed**
 - XHTML elements must be in **lowercase**
 - XHTML documents must have **one root element**
- XHTML Attributes
 - Attribute names must be in **lower case**
 - Attribute values must be **quoted**
 - Attribute minimization is **forbidden**