Internet Programming

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Internet

- The *Internet* is a massive network of networks, a networking infrastructure.
- It connects millions of computers together globally.
- Forming a network in which any computer can communicate with any other computer.
- Information that travels over the Internet through protocols.

World Wide Web

- A system of internet servers that support specially formatted documents. The documents are formatted in a markup language called HTML that supports links to other documents, as well as graphics, audio, and video files.
- Web Browser like “Netscape Navigator” and “Microsoft's Internet Explorer” make it easy to access the World Wide Web.

Difference

- **Internet**

  Network of networks, in which millions of computers are connects together globally, forming a network in which any computer can communicate with other computer.

- **WWW**

  WWW is a way of accessing information over the medium of the Internet.

  The Web uses the HTTP protocol.

Markup Language

- A markup language gives extra information about a piece of text. For example <B> means bold in the HTML language. <B> is a markup tag.

History of Markup Language

The term *markup* is derived from the traditional publishing practice of *"marking up"* a manuscript, that is, adding symbolic printer's instructions in the margins of a paper manuscript.

GenCode

1967

The idea of *markup languages* was apparently first presented by publishing executive William W. Tunnicliffe at a conference in 1967, although he preferred to call it *"generic coding."* Tunnicliffe would later lead the development of a standard called GenCode for the publishing industry.

TeX

1970s and 80s

Another major publishing standard is “TeX”, created and continuously refined by Donald Knuth.

- TeX concentrated on ***detailed layout of text and font descriptions***.
- This required Knuth to spend considerable time investigating the art of “Typesetting”.
- TeX requires considerable skill from the user.
- A TeX macro package known as “LaTeX”.

Scribe 1980

The first language to make a clear and clean distinction between structure and presentation, developed by Brian Reid.

- It introduced the idea of styles separated from the marked up document .
- Scribe influenced the development of Generalized Markup Language (later SGML).

SGML (*Standard Generalized Markup Language*) 1986

A metalanguage in which one can define markup languages for documents.

SGML itself does not specify any particular formatting, but it specifies the rules for tagging elements.

- SGML was originally designed to enable the sharing of machine-readable documents in large projects in government, legal and industry.
- It has also been used extensively in the printing and publishing industries.
- HTML, which is one way of defining and interpreting tags according to SGML rule.
- Because it is a large and complex system, it is not yet widely used on personal computers.

HTML (*Hyper Text Markup Language*) 1991

- HTML was originally designed based on SGML tagging but without SGML's emphasis on rigorous markup.

XML ***(Extensible Markup Language)***

- XML is a simplified rework of SGML, which is designed so to make the XML parser much easier to implement, compared to an SGML parser.
- XML is used for general-purpose applications, such as the XHTML, SOAP and etc.

What is an HTML File?

- HTML stands for **H**yper **T**ext **M**arkup **L**anguage
- An HTML file is a text file containing small **markup tags**
- The markup tags tell the Web browser **how to display** the page
- An HTML file must have an **htm** or **html** file extension
- An HTML file can be created using a **simple text editor**
- An HTML tags are **case-insensitive**

Note: If you want to follow the latest web standards, you should always use lowercase tags.

Example:

```
<html>

    <head>
        <title>Title of page</title>
    </head>

   <body> This is my first homepage.
                <b>This text is bold</b>
    </body>

</html>
```


Example Explanation

- The first tag in your HTML document is <html>. This tag tells your browser that this is the start of an HTML document. The last tag in your document is </html>. This tag tells your browser that this is the end of the HTML document.
- The text between the <head> tag and the </head> tag is header information. Header information is not displayed in the browser window.
- The text between the <title> tags is the title of your document. The title is displayed in your browser's caption.
- The text between the <body> tags is the text that will be displayed in your browser.
- The text between the and tags will be displayed in a bold font.

Tags Attributes

Tags can have attributes. Attributes provide additional information to an HTML element. e.g. **<table border="0">**

- Attributes always come in name/value pairs like this: name="value".
- Attributes are always specified in the start tag of an HTML element.
- Attributes and attribute values are also case-insensitive.
- Attribute values should always be enclosed in quotes. Double style quotes are the most common, but single style quotes are also allowed.
- In some rare situations, like when the attribute value itself contains quotes, it is necessary to use single quotes:
- name='John "ShotGun" Nelson'

Headings

Headings are defined with the <h1> to <h6> tags.

<h1> defines the largest heading. <h6> defines the smallest heading.

```
<h1>This is a heading</h1>
<h2>This is a heading</h2>
<h3>This is a heading</h3>
<h4>This is a heading</h4>
<h5>This is a heading</h5>
<h6>This is a heading</h6>
```

HTML automatically adds an extra blank line before and after a heading.

Paragraphs

Paragraphs are defined with the <p> tag.

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

HTML automatically adds an extra blank line before and after a paragraph.

Line Breaks

The ***
*** tag is used when you want to end a line, but don't want to start a new paragraph.

```
<p>I <br> Love <br>Pakistan</p>
```

Note: The <br> tag is an empty tag. It has no closing tag.

Comments in HTML

The comment tag is used to insert a comment in the HTML source code. A comment will be ignored by the browser.

```
<!-- This is a comment -->
```

HTML Backgrounds

The <body> tag has two attributes where you can specify backgrounds. The background can be a color or an image.

Bgcolor

The bgcolor attribute specifies a background-color for an HTML page. The value of this attribute can be a hexadecimal number, an RGB value, or a color name:

<body bgcolor="#000000">
<body bgcolor="rgb(0,0,0)">
<body bgcolor="black">

Background

The background attribute specifies a background-image for an HTML page.

<body background="clouds.gif">

Linking to Another Web-Page

Anchor Tag and *href* attribute

The <a> tag is used to create an anchor to link from and href attribute is used to address the document to link to, and the words between the open and close of the anchor tag will be displayed as a hyperlink.

Text to be displayed

Example:

Visit G-Mail

Linking to Another Web-Page

Anchor Tag and *target* attribute

With the target attribute, you can define **where** the linked document will be opened.

The line below will open the document in a new browser window:

******
Visit Google
******

Linking Within Documents

Anchor Tag and *Name* attribute

The name attribute is used to create a named anchor. When using named anchors we can create links that can jump directly into a specific section on a page, instead of letting the user scroll around to find what he/she is looking for.

Linking B/W Your Own Page

- If you want to create a link from one page to another page on the same computer.

Text File is Here.

- You can also use an image as a link:

******
<img border="0" src="buttonnext.gif" width="65">

E-Mail Link on Your Page

You can add your E-Mail address on your web-page, so that your reader can reply/feed-back while visiting your page. This is the simply way to enable readers of your web-pages to "talk back" to you.

*** Send me an E-Mail ***

Text Alignment

- The ***align*** attribute allows you to left-justify, right-justify or center text.

```
<p align="left">
    I love Pakistan.<br />
    I love Pakistan.<br />
    I love Pakistan.<br />
</p>
```


HTML Lists

Unordered Lists

An unordered list starts with the ***<ul>*** tag. Each list item starts with the ***<li>*** tag.

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

Output:

- Coffee
- Milk

HTML Lists

Ordered Lists

An ordered list starts with the <ol> tag. Each list item starts with the <li> tag.

```
<ol>
    <li>Coffee</li>
    <li>Milk</li>
</ol>
```

Output:

1. Coffee
2. Milk

HTML Lists

Definition Lists

Definition lists are indented lists without any number or symbol in front of each item.

```
<dl>
    <dt>Coffee</dt>
    <dd>Black hot drink</dd>
    <dt>Milk</dt>
    <dd>White cold drink</dd>
</dl>
```

Output:

Coffee
    Black hot drink
Milk
    White cold drink

Text Formatting

```
<b>This text is bold</b>
<strong> This text is strong </strong>
<big> This text is big </big>
<em>This text is emphasized</em>
<i>This text is italic</i>
<small>This text is small</small>
This text contains <sub>subscript </sub>
This text contains <sup> superscript </sup>
```

This text is bold
This text is strong
This text is big
This text is emphasized
This text is italic
This text is small
This text contains subscript
This text contains superscript

Font Size and Color

The <big>, <small> and etc. gives you some rudimentary control over the size and appearance of the text on your page.

For more control and size on the appearance of your text you can use in HTML.

***This text will be big and purple ***

HTML Character Entities

Some characters have a special meaning in HTML. If we want the browser to actually display these characters we must insert character entities in the HTML source. A character entity has three parts:

1. an ampersand (&)
2. an entity name
3. # and an entity number, and finally a semicolon(;).

To display < in an HTML document we write: **<** or **<**

Name instead of a number is easier to remember.

Not all browsers support the newest entity names.

Note: that the entities are case sensitive.

Most Common Character Entities

Result	Description	Entity Name	Entity Number
	non-breaking space		
<	less than	&lt;	&#60;
>	greater than	&gt;	&#62;
&	ampersand	&amp;	&#38;
"	quotation mark	&quot;	&#34;
'	apostrophe	' (does not work in IE)	&#39;

Commonly Used Character Entities

Result	Description	Entity Name	Entity Number
¢	cent	&cent;	&#162;
£	pound	&pound;	&#163;
¥	yen	&yen;	&#165;
§	section	&sect;	&#167;
©	copyright	&copy;	&#169;
®	registered trademark	&reg;	&#174;
×	multiplication	&times;	&#215;
÷	division	&divide;	&#247;

Tables

- Tables are 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). The letters td stands for "table data," which is the content of a data cell. A data cell can contain text, images, lists, paragraphs, forms, horizontal rules, tables, etc.

Example

```
<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>
```

How it looks in a browser:

row 1, cell 1	row 1, cell 2
row 2, cell 1	row 2, cell 2

Tables and the Border Attribute

If you do not specify a border attribute the table will be displayed without any borders. Sometimes this can be useful, but most of the time, you want the borders to show.

<table border="0">

<table border="1">

Headings in a Table

Headings in a table are defined with the <th> tag.

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

Heading	Another Heading
row 1, cell 1	row 1, cell 2

Spans two columns

```
<table border="1">
    <tr>
          <th>Name</th>
          <th colspan="2">Telephone</th>
    </tr>
    <tr>
          <td>Bill Gates</td>
          <td>555 77 854</td>
          <td>555 77 855</td>
    </tr>
</table>
```

Name	Telephone	
Bill Gates	555 77 854	555 77 855

Spans two Rows

```
<table border="1">
    <tr>
        <th>First Name:</th>
        <td>Bill Gates</td>
    </tr>
    <tr>
        <th rowspan="2">Telephone:</th>
        <td>555 77 854</td>
    </tr>
    <tr>
        <td>555 77 855</td>
    </tr>
</table>
```

First Name:	Bill Gates
Telephone:	555 77 854
	555 77 855

Other attributes of Table

- <table border="1" ***bgcolor="red"***>
- <table border="1" ***background="clouds.jpg"***>
- <td ***bgcolor="red"***>First</td>
- <td ***background="clouds.jpg"***>First</td>
- <td ***align="left"***>

Forms

A form is an area that can contain form elements.

Form elements are elements that allow the user to enter information (like text fields, text area fields, drop-down menus, radio buttons, checkboxes, etc.) in a form.

<form>

</form>

Input --- Text Fields

The most used form tag is the <input> tag. The type of input is specified with the type attribute.

Text fields are used when you want the user to type letters, numbers, etc. in a form.

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

First name:

Last name:

Input --- Hidden Fields

The most used form tag is the <input> tag. The type of input is specified with the type attribute.

Text fields are used when you want the user to type letters, numbers, etc. in a form.

```
<form>
   First name: <input type="hidden" name="firstname">
</form>
```


Radio Button

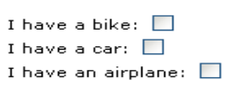
Radio Buttons are used when you want the user to select one of a limited number of choices.

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

Checkboxes

Checkboxes are used when you want the user to select one or more options of a limited number of choices.

```
<form>
   I have a bike: <input type="checkbox" name="vehicle" value="Bike" /><br >
   I have a car: <input type="checkbox" name="vehicle" value="Car" /><br >
   I have an airplane:<input type="checkbox" name="vehicle" value="Airplane"
   >
</form>
```

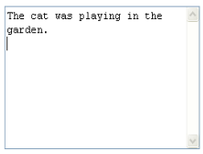


Drop Down Box

```
<select name="country">
      <option value="pakistan">Pakistan</option>
      <option value="india">India</option>
</select>
```

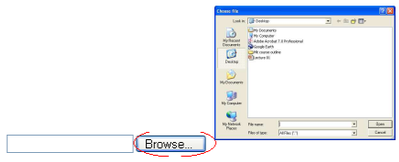
Text Area

```
<textarea rows="10" cols="30">
    The cat was playing in the garden.
</textarea>
```



File Upload

```
<input type="file"  name="uploadedfile" >
```



Button

```
<form >
    <input type="submit" value="Submit!">
</form>
```