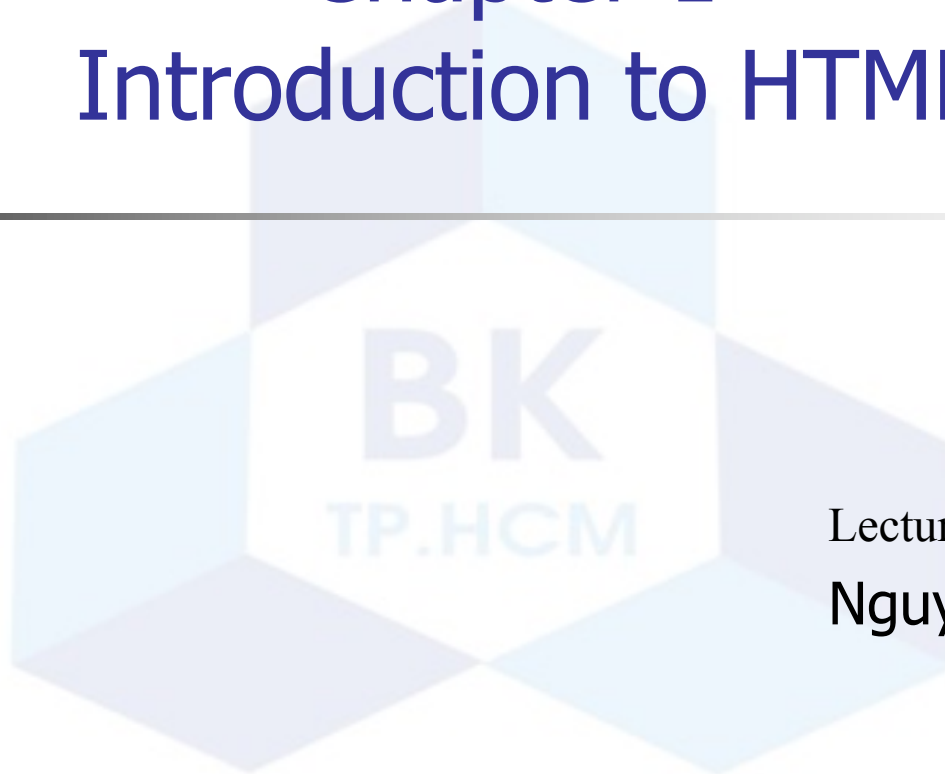# Chapter 1
Introduction to HTML

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What is an HTML File?

- HTML stands for HyperText Markup Language
- 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
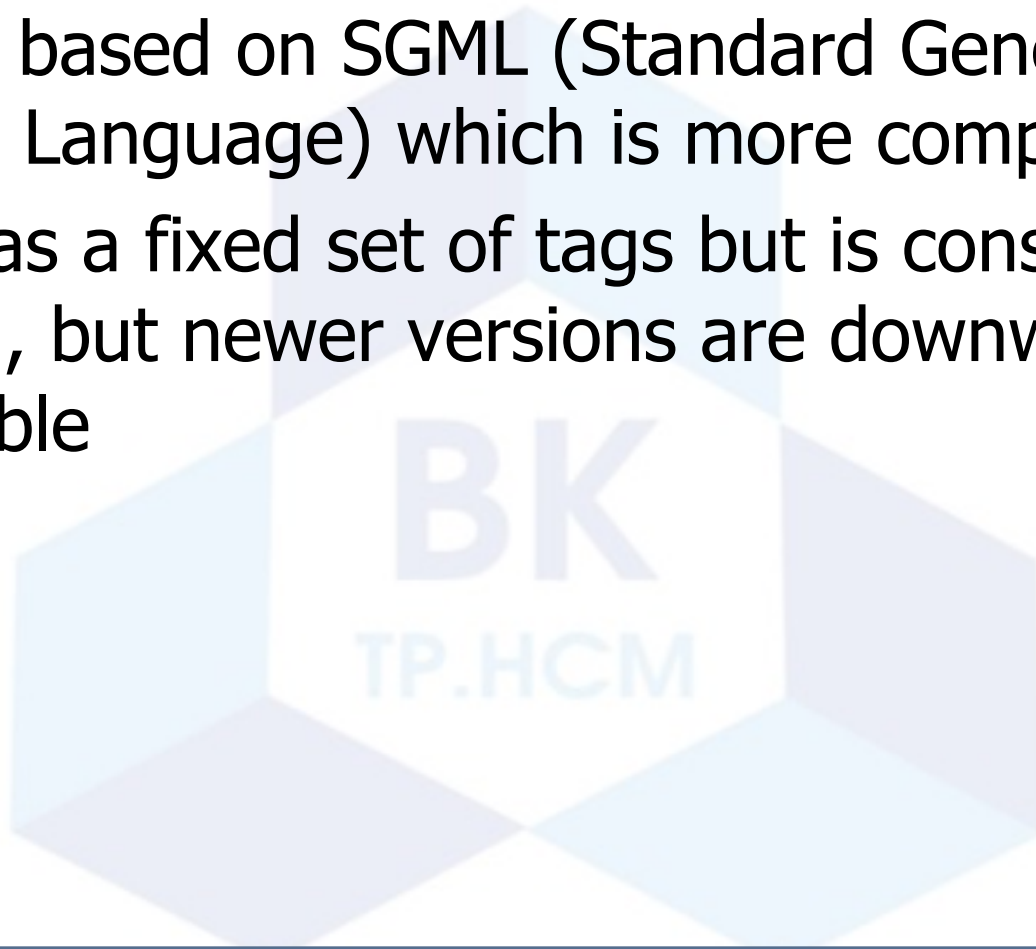- An HTML file can be created using a simple text editor

Markup languages

- Suppose we have a document containing only plain text

- We tag certain parts of the document to indicate what they are and how they should be formatted

- This procedure is called marking-up the document

  - Tags are usually paired:

  - e.g. <title>My Memory</title>
    A pair of tags plus their content constitute an element

  - Un-paired tags are called empty tags

Markup languages

- HTML is the HyperText Markup Language

- HTML is based on SGML (Standard Generalised Markup Language) which is more complex

- HTML has a fixed set of tags but is constantly evolving, but newer versions are downward compatible

A basic document

- <!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">

- There are three required elements, defined by the tags <html>, <head> and <body>

- Every document should start with the following lines:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.0
Transitional//EN">
<html>
   <head>
      <title>My Home Page</title>
   </head>
   <body>
      <h1>Welcome</h1>
   </body>
</html>
```

Welcome

Common DOCTYPE Declarations

HTML 5

```
<!DOCTYPE html>
```

HTML 4.01 Strict

This DTD contains all HTML elements and attributes, but does NOT INCLUDE presentational or deprecated elements (like font). Framesets are not allowed.

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
```

HTML 4.01 Transitional

This DTD contains all HTML elements and attributes, INCLUDING presentational and deprecated elements (like font). Framesets are not allowed.

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
```

HTML 4.01 Frameset

This DTD is equal to HTML 4.01 Transitional, but allows the use of frameset content.

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Frameset//EN" "http://www.w3.org/TR/html4/frameset.dtd">
```

XHTML 1.0 Strict

This DTD contains all HTML elements and attributes, but does NOT INCLUDE presentational or deprecated elements (like font). Framesets are not allowed. The markup must also be written as well-formed XML.

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

Xem thêm: https://www.w3schools.com/tags/tag_doctype.asp

Elements

- HTML elements are written with a **start** tag, with an **end** tag, with the **content** in between:

    <tagname>content</tagname>

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

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

- Some HTML elements do not have an end tag.

Start tag	Element content	End tag
<h1>	My First Heading	</h1>
<p>	My first paragraph.	</p>

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: **name**="**value**"
- Example: <tagname **name**="**value**">content</tagname>
- A complete list, of all legal attributes for each HTML element, is listed at:

  https://www.w3schools.com/tags/default.asp

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)
value	Specifies the value (text content) for an input element.

Block elements

- Block elements define sections of text, usually preceded by a blank line
- **\<p>\</p>** - paragraph
- **\<h1>\</h1>…\<h6>\</h6>** - headings
- **\<pre>\</pre>** - preserve (original format)
  - Not supported in HTML5
- **\<blockquote>\</blockquote>** - indented text
- **\<div>\</div>** - division
  - used to identify a section of the document that may be subject to special formatting (for example, using stylesheets).

Paragraphs

- Paragraphs: **\<p\>…\</p\>**
  - Force a break between the enclosed text and the text surrounding
  - The tagged region of text may be subject to special formatting

- **\<p align="center"\>**Here is another paragraph**\</p\>**
  - align is an attribute of the paragraph tag – center is the value of the align attribute

\<p\>here is a piece of text that has been placed inside a paragraph\</p\>
\<p align="center"\>Here is another paragraph\</p\>

here is a piece of text that has been placed inside a paragraph

Here is another paragraph

Headings

- Six levels of importance **<h1>**...**<h6>**
- Use headings to divide document into sections

```html
<html>
  <head>
    <title>Headings</title>
  </head>
  <body>
    <h2>Chapter 1</h2>
    <h3>1. Introduction</h3>
    This is the introduction
    <h3>2. Next section</h3>
    This is the next section
    <h4>2.1 A subsection</h4>
    This is a subsection
  </body>
</html>
```

Chapter 1

1. Introduction

This is the introduction

2. Next section

This is the next section

2.1 A subsection

This is a subsection

Element relationships

- The elements marked by tags form a hierarchy
- The root element is html (marked by <html>…</html>)
- It usually has two children: head and body
  - each of these are further subdivided
- There are rules for which elements can contain other elements
  - e.g. headers cannot contain headers
  - See http://www.w3.org/ for a full list of rules
  - Elements must not overlap each other
  - We cannot have: <h1>…<a..> … </h1>…
  - We can have: <h1>…<a..> … …</h1>

Inline descriptive elements

- Descriptive elements affect the appearance of text depending on how the text is described
  - `<em></em>` emphasis, usually with italics
  - `<strong></strong>` strong, usually with bold
  - `<cite></cite>` citation, usually in italics
  - `<code></code>` usually results in monotype spacing

```
<body>
    A <em>fascinating</em> subject
that I <strong>must</strong>
Understand
</body>
```

A *fascinating* subject that I
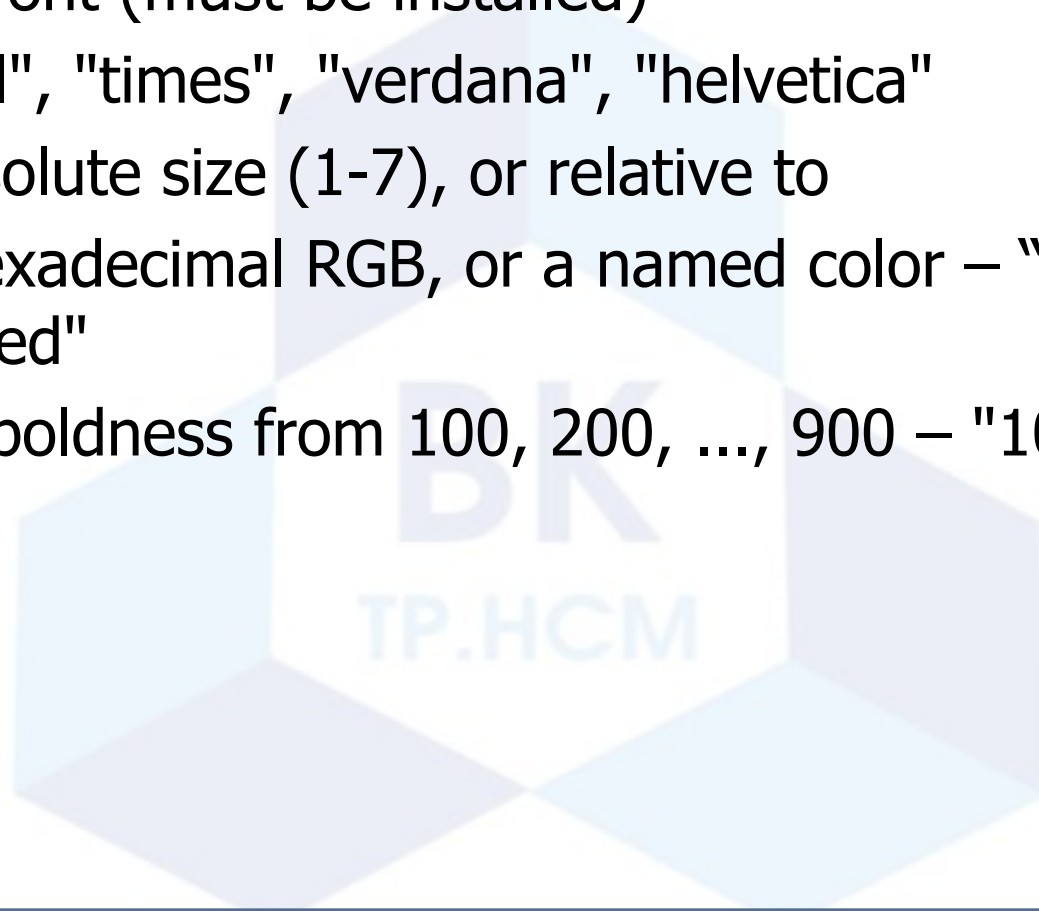**must** understand

Inline explicit style elements

-
- <big></big> bigger font than surrounding text
- <small></small> smaller font than surrounding text
- <i></i> italics
- <s></s> strikethrough
- subscripts
- superscripts
- delimits text for stylesheet control

Inline explicit style elements

- <font> attributes face
- name of font (must be installed)
- e.g. "arial", "times", "verdana", "helvetica"
- size - absolute size (1-7), or relative to
- color - hexadecimal RGB, or a named color – "#3399dd", "blue", "red"
- weight - boldness from 100, 200, ..., 900 – "100", "300", "900"

Unordered lists

- Unordered lists <ul>...
- ... for the list elements ○ each item has a bullet

```
<body>
    some normal text
    <ul>
        <li>apples</li>
        <li>oranges</li>
        <li>pears</li>
        <li>bananas</li>
    </ul>
</body>
```

some normal text

- apples
- oranges
- pears
- bananas

Ordered lists

- Ordered lists \<ol\>...\</ol\>
- \<li\>...\</li\> for the list elements ○ each item has a number

```
<body>
    some normal text
    <ol>
        <li>apples</li>
        <li>oranges</li>
        <li>pears</li>
        <li>bananas</li>
    </ol>
</body>
```

some normal text

1. apples
2. oranges
3. pears
4. bananas

Definition lists

- `<dl></dl>` The enclosing tags
- `<dt></dt>` The definition term
- `<dd></dd>` The definition

```
<dl>
    <dt>MIME</dt>
    <dd>Multipurpose...</dd>
    <dt>FTP</dt>
    <dd>File transfer...</dd>
    <dt>TCP</dt>
    <dd>Transmission...</dd>
</dl>
```

MIME
    Multipurpose...
FTP
    File transfer...
TCP
    Transmission...

Nested lists

- A list may contain another list
- The inner list is nested inside the outer list

```
<body>
  <ol>
    <li>apples</li>
    <ul>
        <li>red</li>
        <li>green</li>
    </ul>
    <li>oranges</li>
    <li>pears</li>
    <li>bananas</li>
  </ol>
</body>
```

```
1.  apples
        o  red
        o  green
2.  oranges
3.  pears
4.  bananas
```

Table

```
<table style="width:100%">
  <tr>
    <th>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>
```

Firstname	Lastname	Age
Jill	Smith	50
Eve	Jackson	94

- An HTML table is defined with the **<table>** tag.
- Each table row is defined with the **<tr>** tag.
- A table header is defined with the **<th>** tag. By default, table headings are bold and centered.
- A table data/cell is defined with the **<td>** tag.

Comments

- Comments are delimited by **<!-- and -->**

- <!– this is a comment -->

- Comments may span multiple lines

```
<body>
    <!-- this is a comment-->
</body>
```

Horizontal lines

- To insert a horizontal line to divide up parts of a document we use the empty tag <hr> , <hr />

- Attributes: align, size (in pixels), width (in pixels or percentage), noshade

```
<body>
    <h1>Chapter 1</h1>
    <hr align="center" size="3″ width="50%" noshade>
    <h2>Introduction</h2>
</body>
```

Chapter 1

_____

Introduction

Special characters

- Some characters such as <, >, " and & have special meanings.

- To prevent them being interpreted as HTML code, they must be written as follows:

- < = <   > = >   "" = "   & = &

- Blank space is normally ignored in HTML. To include a space in your document use:

```
<body>
   A <em> &lt; fascinating &gt; </em>
subject that I
<strong>m u s t</strong>
understand
</body>
```

A < *fascinating* >
subject that I **m u s t**
understand

Links

- The link (anchor) element **<a>...** provides hypertext links between

    1. different documents (using a URL)

    2. different parts of an individual document

- User selection of the link (hot spot) results in

    1. retrieval and display of the designated document

    2. movement to relevant part of same document

Link with URL

- The href attribute gives the URL of the target page
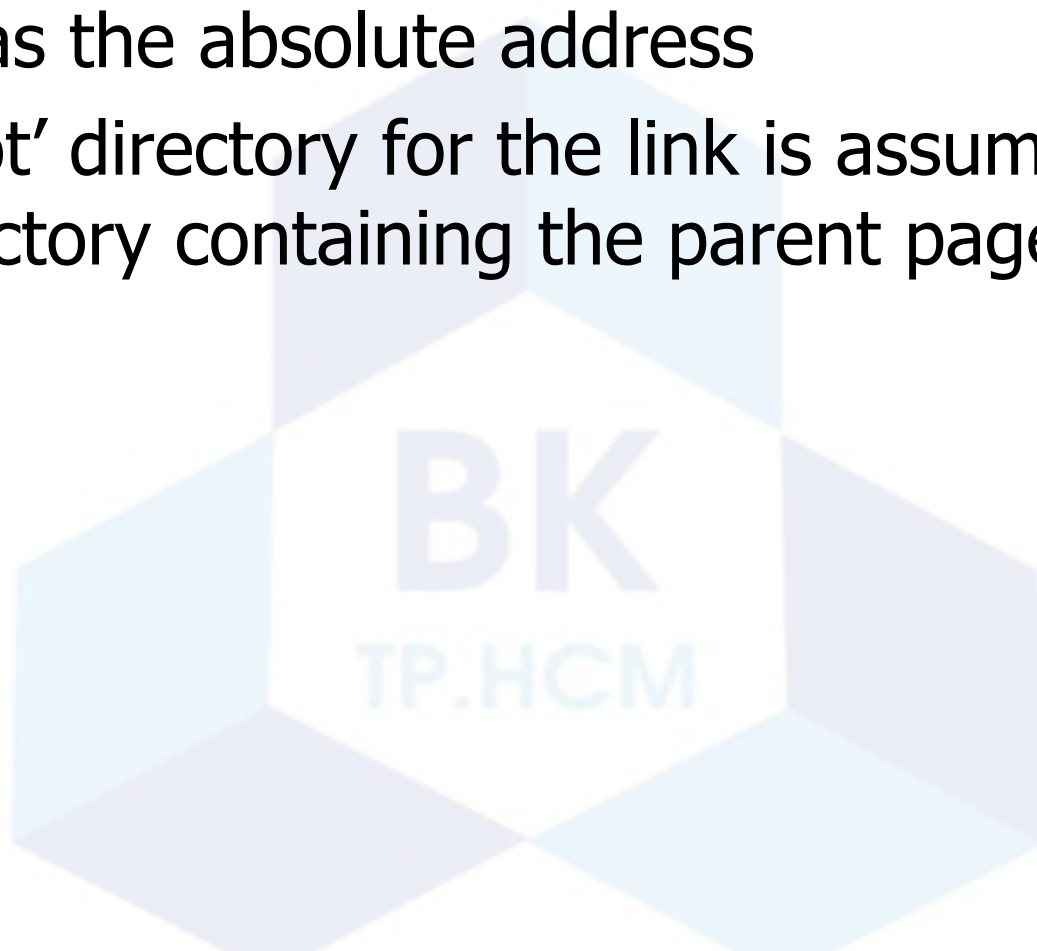- The text between the tags is highlighted – selecting it activates the link

```
<body>
   The Department of
   <a href="https://cse.hcmut.edu.vn">
      Computer Science
   </a>
    is a very ....
</body>
```

The Department of Computer Science is a very ....

Relative addressing

- The previous example gave the full path name, known as the absolute address

- The 'root' directory for the link is assumed to be the directory containing the parent page of the link

Addressing

Giả sử trang web hiện tại đang được phục vụ ở địa chỉ:
http://domain.com/news/index.html
```
<a href="research.html">Research</a>
```
→ http://domain.com/news/research.html
```
<a href="./pub.html">Publications</a>
```
→ http://domain.com/news/pub.html
```
<a href="../index.html">Computer</a>
```
→ http://domain.com/index.html
```
<a href="/index.html">Computer</a>
```
→ http://domain.com/index.html
```
<a href="http://domain.com">Computer</a>
```
→ http://domain.com
```
<a href="//domain.com">Computer</a>
```
→ http://domain.com (cùng giao thức với trang hiện tại)
```
<a href="research.html#note">Research</a>
```
→ http://domain.com/news/research.html (và di chuyển đến phần tử có giá trị thuộc tính id là "note")

Images

- ## Images are included using the empty tag <img>

  - Example: <img src="mypicture.gif" alt="my picture">

- ## The src attribute specifies the file containing the Image absolute or relative path names can be used (see http://www.w3schools.com/tags/tag_img.asp)

- ## The alt attribute specifies the text to be displayed if the image is not viewed

  - some users choose not to display images (for faster download)

  - also used for compatibility with older browsers

Image attributes

Attribute	Value	Description
align	top bottom middle left right	Not supported in HTML5. Specifies the alignment of an image according to surrounding elements
alt	text	Specifies an alternate text for an image
border	pixels	Not supported in HTML5. Specifies the width of the border around an image
crossorigin ⬛	anonymous use-credentials	Allow images from third-party sites that allow cross-origin access to be used with canvas
height	pixels	Specifies the height of an image
hspace	pixels	Not supported in HTML5. Specifies the whitespace on left and right side of an image
ismap	ismap	Specifies an image as a server-side image-map
longdesc	URL	Specifies a URL to a detailed description of an image
sizes		Specifies image sizes for different page layouts
src	URL	Specifies the URL of an image
srcset	URL	Specifies the URL of the image to use in different situations
usemap	#mapname	Specifies an image as a client-side image-map
vspace	pixels	Not supported in HTML5. Specifies the whitespace on top and bottom of an image
width	pixels	Specifies the width of an image

Links with images

- A link element can include an image instead of text
- both images and text can be included if required

```
<body>
    Enter my world of cats
    <a href="cats.html">
        <img src="cat.gif" height="60" width="60" align="middle" alt="cat" />
    </a>
</body>
```
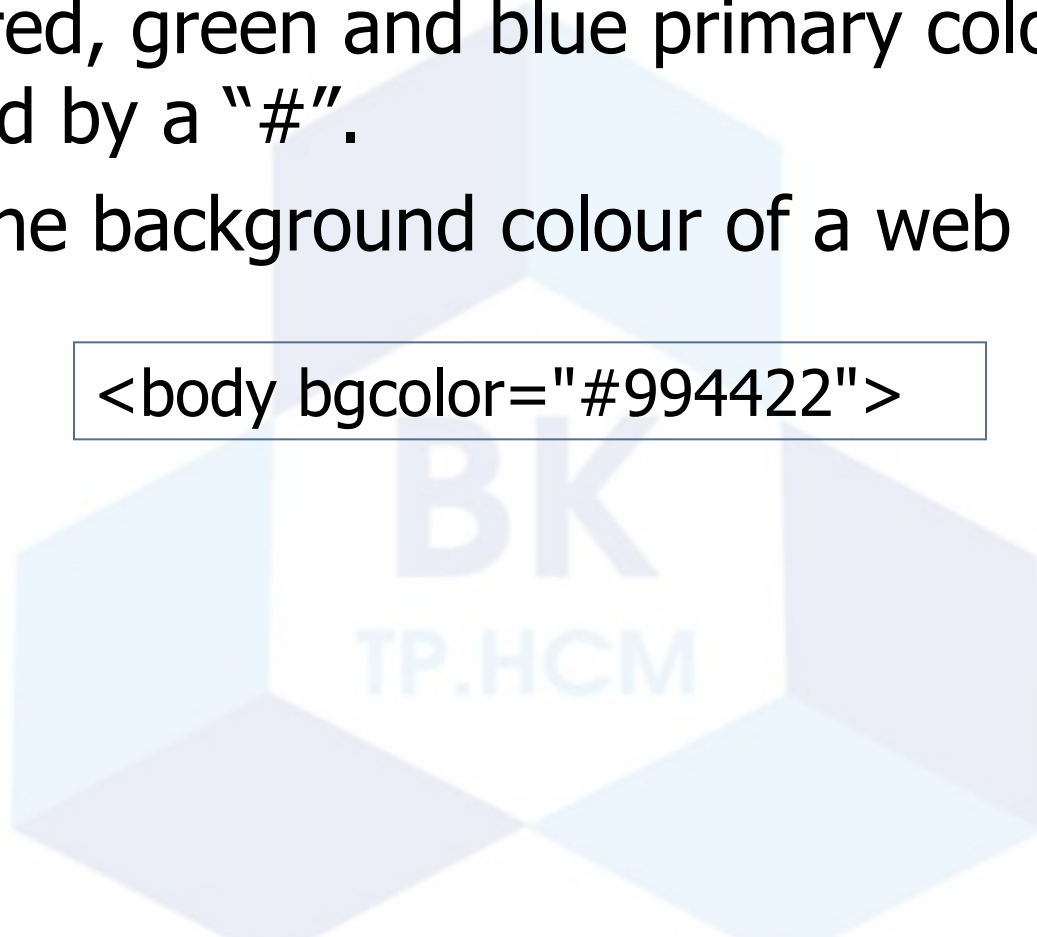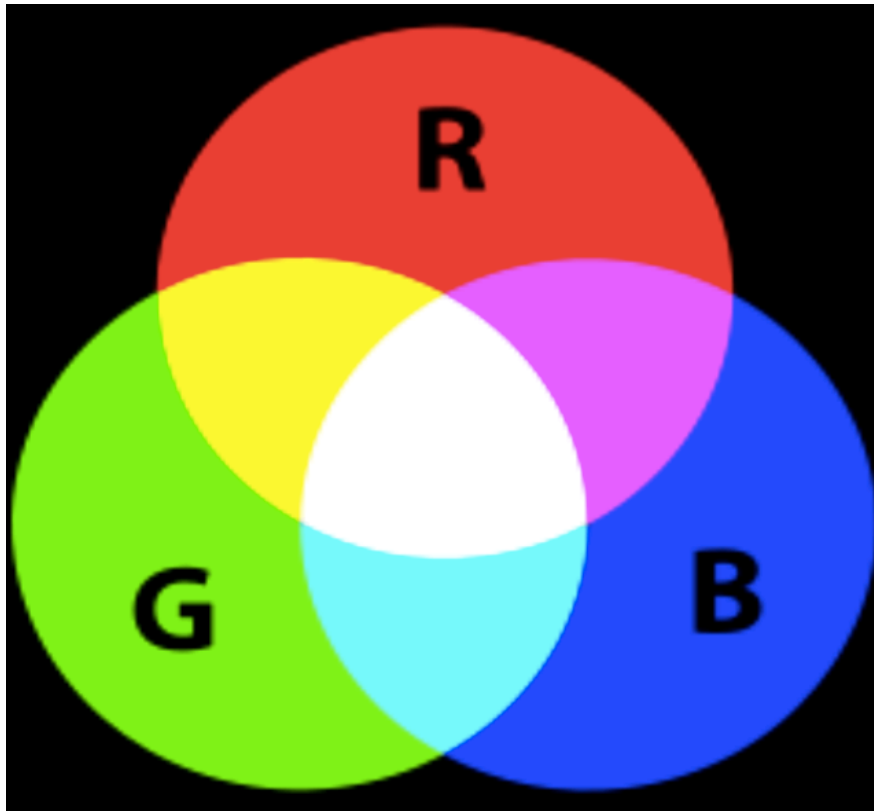

Enter my world of cats

Colour

- Colours are specified with hexadecimal numbers for the red, green and blue primary colours, preceded by a "#".

- To set the background colour of a web page

<body bgcolor="#994422">

Colour – RGB Model
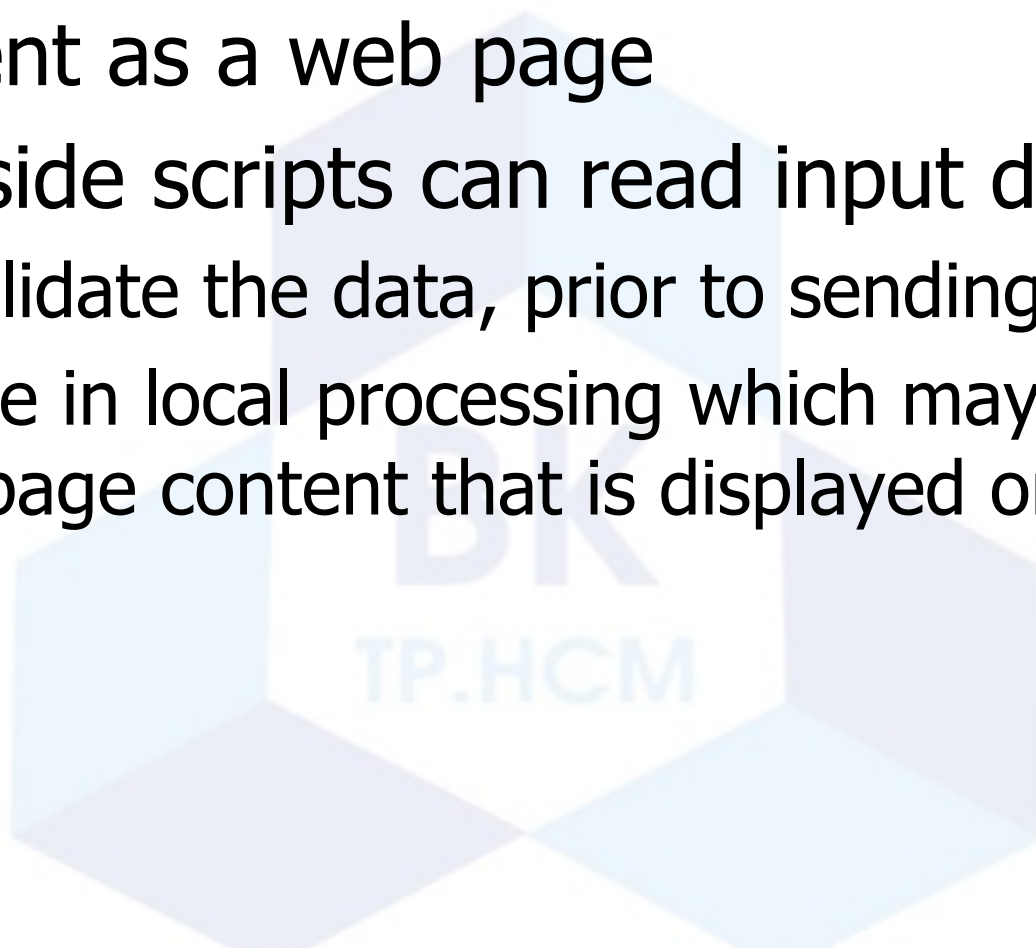

- #ff0000 (red),
- #00ff00 (green) – #0000ff (blue)
- #ffff00 (yellow)
- ...
- #3395ab (a pastel blue)

Forms

- Server-based programs may return data to the client as a web page

- Client-side scripts can read input data
  - To validate the data, prior to sending to server
  - To use in local processing which may output web page content that is displayed on the client

Example applications

- Questionnaires to provide feedback on a web site e-commerce, to enter name, address, details of purchase and

- credit-card number
  - request brochures from a compan
  - make a booking for holiday, cinema etc. ❖ buy a book, cd, etc
  - obtain a map giving directions to a shop

- Run a database query and receive results (an important part of e- commerce)

Form Elements

- text
- checkbox
- radio (buttons)
- select (options)
- textarea
- password
- button
- submit
- reset
- hidden
- file
- image

The method and action attributes

- The method attribute specifies the way that form data is sent to the server program

  - GET appends the data to the URL

  - POST sends the data separately

- The action attribute specifies a server program that processes the form data (often as a URL)

```
<body>
  <form method="POST" action="comments.php">
    <h2>Tell us what you think</h2>
    <!-- etc -->
  </form>
</body>
```

The input element: type="text"

- The type attribute specifies the type of user input
- The name attribute gives an identifier to the input data

```
<form method="POST" action="comments.php">
  <h2>Tell us what you think</h2>
  Name <input name="name" type="text" size="20" />
  <br>
  Address <input name="address" type="text" size="30" />
</form>
```

Tell us what you think

Name [   ]

Address [   ]

The input element: type="checkbox"

- The name attribute is used to define a set of checkboxes
- The value attribute identifies the individual checkbox
- If the checked attribute is set the box is initially checked

```
How did you hear about this web site?
<br>
A friend
<input type="checkbox" name="name" value="friend" />
<br>
Search engine
<input type="checkbox" name="name" value="engine" />
```

How did you hear about this web site?
A friend ☐
Search engine ☐
Followed a link ☐

The input element: type="radio"

- Radio buttons are similar to checkboxes, but only one can be selected

- To select a button by default, use the checked attribute (for one button only)

How did you hear about this web site?

A friend
<input type="radio" name="name" value="friend" />

Search engine
<input type="radio" name="name" value="engine" />

How did you hear about this web site?
A friend   O
Search engine   O
Followed a link   O

The input element: type="button"

- The name attribute uniquely identifies a button
- The value attribute gives a label to the button
- Actions can be associated with buttons using JavaScript

```
Do you want to receive any further information:
<br>
<input type="button" name="yes" value=" Yes" />
<input type="button" name="no" value=" No" />
```

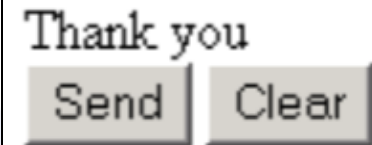Do you want to receive any further information:
Yes   No

The input element: type="submit/reset"

- **type="submit"**
  - clicking this button sends the form data to the program (URL) specified in the action attribute of the form

- **type="reset"**
  - clicking this button clears all data entered so far

```
Thank you<br>
<input type="submit" name="send" value="Send" />
<input type="reset" name="clear" value="Clear" />
```

The input element:type="password/file/hidden"

- type="password"
  - similar to type="text" except that the input is
  - echoed"*****" with asterisks (so not visible)
- type="file"
  - provides a file dialogue box to specify a file that is sent to the server
- type="hidden"
  - similar to text input, but the value attribute is used to specify data that is to be sent to the server. Nothing appears on the screen.
  - The data might be set by a server program to keep track of the details of a particular transaction.

The textarea element

- Used for multi-line text input
- The size of the input area is specified with the cols and rows attributes
- Any text placed inside the element appears in the input area (this can be deleted).

```
Please write your comments:<br>
<textarea name="comments" rows="5" cols="20">
 put text here
</textarea>
```
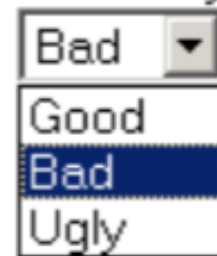
Please write your comments:

put text here

The select element

- The select element provides a menu of options
- An option can be selected by default using the selected attribute (otherwise the first in the list is initially selected)

```
How do you rate this site?<br>
<select name="rating">
 <option>Good</option>
 <option selected>Bad</option>
 <option>Ugly</option>
</select>
```

How do you rate this site?

Bad ▼

Good
Bad
Ugly

Tài Liệu Tham Khảo

- [1] Stepp,Miller,Kirst. Web Programming Step by Step.(1st Edition, 2009) Companion Website: http://www.webstepbook.com/

- [2] W3Schools, http://www.w3schools.com/html/default.asp