

CS2204 Fundamentals Of IAD

3. HTML - Part II

3.1. Lists

- 3.1.1. Unordered & Ordered List
- 3.1.2. Definition List

3.2. Table

- 3.2.1. Table Details
- 3.2.2. Table Cells Merging
- 3.2.3. Table Good Practice

3.3. Form

- 3.3.1. How Form Works?
- 3.3.2. Basic Input Element Types
- 3.3.3. New (HTML5) Element Types
- 3.3.4. Query String
- 3.3.5. Processing Details
- 3.3.6. Form Good Practice

3.4. Multimedia

- 3.4.1. Video & Audio
- 3.4.2. Cross Browser Support
- 3.4.3. Canvas
- 3.4.4. Animation

3.5. What Is Doctype?

3.6. Web Page Validation

3.7. W3Schools Quick Reference

- 3.7.1. Quick Reference 1
- 3.7.2. Quick Reference 2 - Deprecated
- 3.7.3. Quick Reference 3
- 3.7.4. Style Related Tags

3.8. Conclusions

3. HTML - Part II

There were only around 20 tags when Tim wrote the standard and now there should be more than 60 tags. Need to be aware of **deprecated** ones and some that are not fully supported by all common browsers.

Commonly used and media related tags are discussed with emphasis on matching structure with the content to be presented.

The meaning of document type will also be explained.

3.1. Lists

3.1. Lists

Lists are elements that give more structure to the content. List is a common way to present items one by one. Itemized data could in fact be presented by headings, paragraphs or headings together with paragraphs; but these are not as structured as a list in comparison.

```
<ul>
  <li> ... </li>
  <li> ... </li>
  ...
</ul>
```

```
<ol>
  <li> ... </li>
  <li> ... </li>
  ...
</ol>
```

3.1.1. Unordered & Ordered List | Unstructured Example? -

<http://courses.cs.cityu.edu.hk/cs1303/example/html/05-LinkTarget.html>

3.1.1. Unordered & Ordered List

Unordered lists are generally used to list any series of items that have no particular order. Items in unordered lists have solid round bullets by **default**. Default means if no other setting is in effect, this one will be used. The bullet style is a style property and should be handled by CSS not HTML.

Note that the list items can contain other elements inside to give lots of variation and highly structured constructions.

Ordered lists contain information where order should be shown. Numbering is automatic when items are added or removed while unordered list or other HTML structure require manual ordering which is difficult to change, e.g. 05-LinkTarget.html.

3.1.2. Definition List | **List example - <http://courses.cs.cityu.edu.hk/cs1303/example/html/07-Lists.html>** | **Unstructured Example - <http://courses.cs.cityu.edu.hk/cs1303/example/html/05-LinkTarget.html>**

3.1.2. Definition List

HTML for definition list is:

```
<dl>
```

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

```
<dd>...</dd>
```

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

```
<dd>...</dd>
```

```
</dl>
```

Easier to remember as **dl** for list, **dt** for title and **dd** for data. To build in even more structure than just a list. commonly used in repeating groups of heading and description (title-data).

Referring to the example, the whole list is outlined, the sub-headings (dt) are red in color and the definition blocks (dd) are grey in background.

3.2. Table

Tables are matching structure for displaying tabular information (row by column). Many information are tabular. Web systems are usually front ends for databases and most of them are still relational. Relational database records are stored as tables.

Basic components:

- table cells/data (**td**): the most basic structural unit of tables, containing data
- table rows (**tr**): horizontal set of cells.

Basic valid HTML required

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

Table Column (**col** & **colgrp**) - vertical set of cells, not fully supported by common browsers, usually not used. Another way to identify columns can be, e.g. first column is in fact all first td's in all row. Will learn this method later in CSS to identify columns.

Cell

C

	1	2	3	4	5	6	7	8
Row 1 →	C	C	C	C	C	C	C	C
Row 2 →	C	C	C	C	C	C	C	C
Row 3 →	C	C	C	C	C	C	C	C
Row 4 →	C	C	C	C	C	C	C	C

3.2.1. Table Details

Caption (<caption>):

- provides a short description of the table's purpose
- only permitted immediately after the <table> start tag
- may only contain one <caption> element in a table

Hheader (<thead>):

- contains column heading information of the table's columns
- can have multiple rows inside, i.e. contain more than one <tr>
- **<th>** is usually used instead of <td>

Body (<tbody>): contains the rows showing the content of the table.

Footer (<tfoot>): contains table foot information of the table, useful sometimes for summary or total information.

ABC Banking Corporation Limited

Online Banking Services

Interest Rate

Deposit Period	HK \$10,000 to HK \$99,999	HK \$100,000 to HK \$499,999	HK \$500,000 to HK \$999,999	HK \$1,000,000 or above
1-day	-	-	-	2.5000%
1-week	2.5000%	2.5000%	2.5000%	2.5000%
2-week	2.5000%	2.5000%	2.5000%	2.5000%
1-month	2.5000%	2.5500%	2.6000%	2.6500%
2-month	2.5000%	2.5500%	2.6000%	2.6500%
3-month	2.5500%	2.6000%	2.6500%	2.7000%
6-month	2.6000%	2.6500%	2.7000%	2.7500%
9-month	2.6500%	2.7000%	2.7500%	2.8500%
12-month	2.7500%	2.8500%	2.9500%	3.0500%

For enquiries, please call 3442-6868

HONG KONG DOLLAR DEPOSIT RATES: FIXED DEPOSIT

Copyright. ABC Banking Corporation Limited 2006. All rights reserved.

3.2.2. Table Cells Merging

3.2.2. Table Cells Merging

It is very common to have cells merged together to form larger cell across columns or rows. The attributes **rowspan** and **colspan** can be used.

Note the attributes must be set in `<td>` not `<tr>`.

```
<td>...</td>  
<td rowspan="2" colspan="2" > ... </td>  
<td>...</td>
```

Should also take away the following td's in the same row or next row otherwise the number of cells would be incorrect because merging means one or more cells would disappear.

1		3
4	5	6
7	8	

1		2	3
4	5		
7	8	6	9

3.2.3. Table Good Practice | **Example - <http://courses.cs.cityu.edu.hk/cs1303/example/html/08-TableCellMerge.html>**

3.2.3. Table Good Practice

Just like list, it is a good practice to build in more structures in table for better control. The tags thead, tbody and tfoot are not required to make your HTML to pass validation but help to give more structure and can have better control in styling later.

By default, there is no border shown for table and it is difficult to check the alignment of table cells. You may create a table (some tools do this by default) with a border attribute

```
<table border="1">...</table>
```

should note that border is style related and not be set in HTML. The border attribute should be taken away after testing.

Similar to list items (), table cells (<td>) may contain other HTML tags too. In the past when CSS styling was not yet fully developed, people used table to control the layout of Web page (divide it into rows and columns - a **grid**). This approach makes the change of layout very difficult because you have to edit the number of rows and columns and should not be used anymore. Layout should be set with CSS.

3.3. Form

3.3. Form

You may not be aware of it but we are using HTML forms all the time, e.g. any login page to Web sites. Form is important because it is the basic (standard) structure that allows user input to be sent:

- back to Web server
- other pages (because all information stored in a page will be lost when it is reloaded or other page is loaded)

To make a form works, two basics parts are required:

- Structure
- Processing Script (in the server or other page)

ABC Banking Corporation Limited - Windows Internet Explorer

http://localhost/CS4281/MoreOnHTML/examg Live Search

ABC Banking Corporation Limited

Contact Us

Please complete and submit the following form. All fields are required.

PERSONAL INFORMATION

Title ☐ Mr ☐ Mrs ☐ Ms

Last Name

First Name

Contact Number

Email Address

To Be Conacted ☒ By Phone ☒ By Email

MESSAGE

Category

Questions/Feedback

Label

Radio Buttons

Textboxes

Checkboxes

Option List

Text Area

Buttons

3.3.1. How form works? | Example - <http://courses.cs.cityu.edu.hk/cs1303/example/html/09-FormElements.html>

3.3.1. How Form Works?

Processing scripts: can be either Web server side script or Javascript in the target page.

A form contains 2 main groups of components:

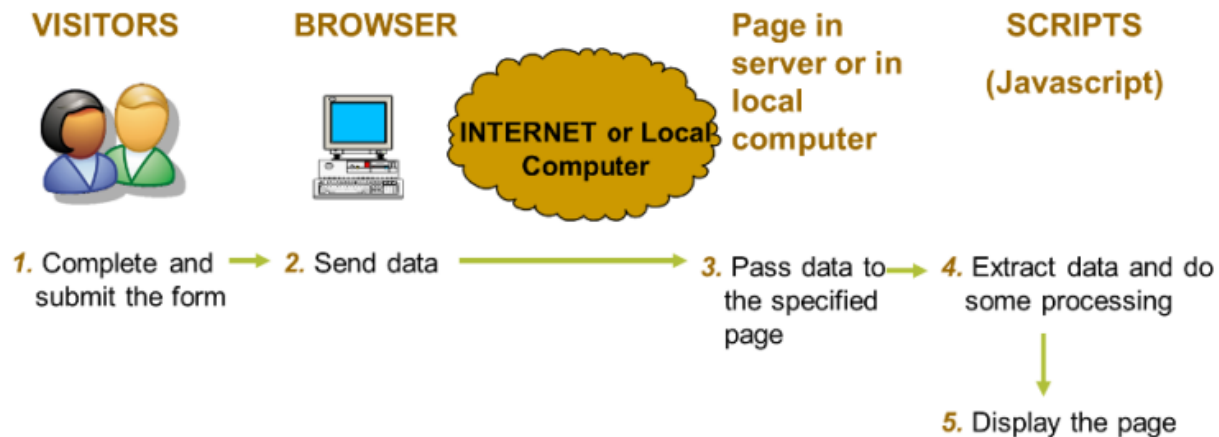
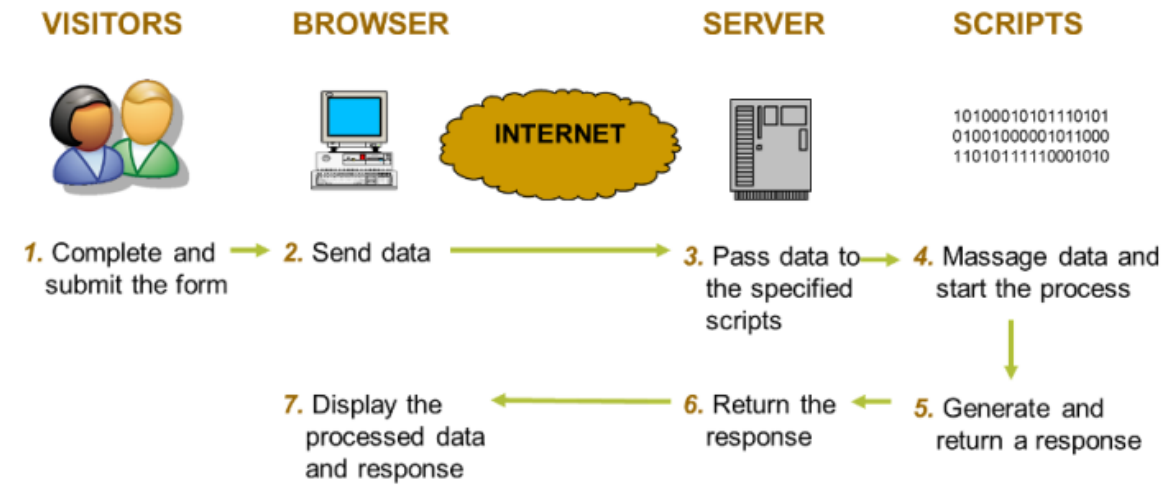
attributes in the form tag:

- method - the way to communicate with the server using HTTP, Get or Post
- action - the URL of the server script or target page that will receive and process the form

input tags inside the form tag:

- include Submit & Reset buttons, when clicked the form will be processed by browser

```
<form method="...">
...
...
<input type="...">
<input type="...">
...
<input type="submit">
<input type="reset">
</form>
```



3.3.2. Basic input element types

3.3.2. Basic Input Element Types

Existed before HTML5.

<i>Element</i>	<i>Common Use</i>
<i>Radio button</i>	<i>Single choice of selection</i>
<i>Text box</i>	<i>Any line of text</i>
<i>Password</i>	<i>Same as text box except data typed will not shown</i>
<i>Select Option</i>	<i>Selection from a drop-down menu</i>
<i>Text Area</i>	<i>Multiple lines of descriptions</i>
<i>Submit button</i>	<i>Send the form out</i>
<i>Reset button</i>	<i>Clear all entered data</i>
<i>Button</i>	<i>Activate actions programmed with Javascript</i>

3.3.3. New (HTML5) element types

3.3.3. New (HTML5) Element Types

Some types not fully supported by all browsers (esp. Firefox).

<i>Element</i>	<i>Common Use</i>
<i>Number</i>	<i>Numbers with a range</i>
<i>Range</i>	<i>Numbers shown as a sliding rule</i>
<i>Email</i>	<i>Email address, browser does the checking on submit</i>
<i>URL</i>	<i>URL address, browser does the checking</i>
<i>Date</i>	<i>Date, can be selected from a calender</i>
<i>Others still under development ...</i>	

3.3.4. Query String

3.3.4. Query String

What exactly is the mechanism for sending the data back to the server by the browser? When the Submit button is clicked, you may notice the address bar of the browser is changed. The URL is appended with a question mark followed by a string. This is called **Query String**. All these are done automatically by the browser.

The query string consists of one or more **name-value** pair.

```
<input type="text" name="title" value="">  
<input type="text" name="lastname" value="">
```

The names come from the name attributes in the input tags and values are from user input. Base on this format, the server side or target page script can extract the values for further processing.

Field 1 =
Value 1

Field 2 =
Value 2

Field 3 =
Value 3

.../cgi-bin/formConfirm.php?title=Mr&lastName=KONG&firstName=T+W&contact=2788+7704&email=cssamk@cityu.edu.hk&byemail=byemail

Click Submit

ABC Banking Corporation Limited - Windows Internet Explorer

http://localhost/CS4281/MoreOnHTML/examples/cgi-bin/formConfirm.php?title=Mr&lastName=Kong&firstName=T+W&contact=2788+7704&email=cssamk@cityu.edu.hk&byemail=byemail

ABC Banking Corporation Limited

ABC Banking Corporation Limited

Online Banking Services

- Deposits
- Payments
- Transfers
- Download
- Contact Us

Contact Us

The following information is sent. Our customer service officer will contact you later.

Item	Value
Title	Mr
Last Name	Kong
First Name	T W
Contact Number	2788 7704
Email Address	cssamk@cityu.edu.hk
To Be Contacted	byemail
Category	
Questions/Feedback	

Copyright: ABC Banking Corporation Limited 2006. All rights reserved.

Done Internet 100%

3.3.5. Processing details

3.3.5. Processing Details

What is the difference in using different method (get or post) to send the form?

Get

- content of the form is sent to Web server as part of the URL
- append the form content as an **encoded** query string in the form of name-value pairs
- the query string can be seen in the address bar of the browser

Post

- content of the form is sent as part of the message content
- the content cannot be seen in the address bar of the browser
- can send binary data (file upload), not just text

Demo - check out the transmission with FF (installed with add-on Live HTTP Headers).
Note the use of the **enctype** attribute.

3.3.6. Form good practice | **Get Example** - <http://courses.cs.cityu.edu.hk/cs1303/example/html/09-FormGet.html> | **Post Example** - <http://courses.cs.cityu.edu.hk/cs1303/example/html/09-FormPost.html> | **Multi-part Example** - <http://courses.cs.cityu.edu.hk/cs1303/example/html/09-FormPostMultipart.html>

3.3.6. Form Good Practice

Basic considerations:

- use names for input tags is essential
- use label to mark different fields
- use **fieldset** & **legend** to group elements, should not use **floating** text
- observe accessibility guidelines and some common usability features e.g. set tab sequence, allow keyboard input and error checking

Note that `<input>` can be used outside `<form>`, a convenient way to get user input for interaction within a page, but data are not sent out.

For new input types, the format checking is provided by browser without using Javascript. Not all browsers support all features (need to test).

3.4. Multimedia

The great improvement in multimedia handling is the strength of HTML5. It is also the slow development of XHTML to and its complication of processing multimedia that led to the forming of the WHATWG. Use of multimedia in HTML5 in fact involves CSS3 and new Javascript **API** (Application Programming Interface) as well.

EMBEDDING VIDEO/AUDIO:

- this is messy in the past because of different plug-ins and media format
- now simplify the element but limit the supported format
- `<video>` & `<audio>`
- even more powerful when we learn Javascript

Drawing - Canvas: a drawing area, like `<div>`, must work together with Javascript

Animation: have to use Javascript in the past, now can use style (CSS level 3)

3.4.1. Video & Audio

HTML5 trades extendability for ease of use. Only 3 video formats are supported: mp4, WebM and ogg. The concept of plug-in is given up.

```
<video src="..." type="video/xxx"></video>
```

value of src is a URL. Audio is the same

```
<audio src="..." type="audio/xxx"></audio>
```

Common useful attributes to control the video:

- controls - show the control bar
- loop - repeat playing
- autoplay - play once fully loaded

Browser support:

- Chrome - mp4, WebM & ogg
- Safari - mp4
- Firefox - mp4, WebM & ogg
- Opera - mp4, WebM & ogg
- IE - mp4

3.4.2. Cross Browser Support

Not all browsers support all the three formats, need to consider providing multiple formats in Web site in order to support common browsers (although mp4 is supported by all). Use of the **source** attribute can handle **cross browser** support.

```
<video controls="controls" autoplay>
  <source src="../../video/wonders.ogg" type="video/ogg">
  <source src="../../video/wonders.mp4" type="video/mp4">
  <h2>Your browser does not support this video format</h2>
</video>
```

Fall back - the browser will process the multiple sources one by one; if the <video> tag is not supported the remaining coding/HTML will be shown. This is called **fall back code**.

3.4.3. Canvas

Canvas means a drawing surface

```
<canvas id="surface" width="300" height="300"> </canvas>
```

The tag only defines an area for drawing, actual action of drawing have to be done with Javascript; will learn more when we learn Javascript

Complex drawing can be done, commonly used for graphing (e.g. <http://stock360.hkej.com/quotePlus/1>)



3.4.4. Animation | Example - <http://stock360.hkej.com/quotePlus/1>

3.4.4. Animation

Animation actually cannot be done by HTML, used to be done with Javascript. As said before, it is common to refer HTML5 techniques as including those of CSS3 which provide many features for animation without Javascript. Will learn more in CSS.

The demo gives an interesting example - moving list items `` with pure CSS style rules.

3.5. What is doctype? | **Animation example - <http://neography.com/experiment/circles/solarsystem/>** | **Animation example description - <http://neography.com/journal/our-solar-system-in-css3/>**

3.5. What Is Doctype?

Looking back at the history of HTML, there are 4 important milestones: HTML 4.01, XML, XHTML and HTML5. How to specify the version if we really want to? The Web page structure consists of a declaration part and `<html>`. Declaration is used to differentiate the HTML version used in the page.

No doctype line - HTML 4.01 is assumed. Only old Web pages that nobody cares to change or pages for quick and dirty work would use this.

One more line before doctype - XML

```
<?xml version="1.0" encoding="UTF-8"?>
```

It gives the ability to define flexibly the structure/grammar of the page by separating out the **Document Type Definition** instead of built in individual browsers.

XHTML is said to be rewriting HTML using the XML method and the set of HTML tags. The !doctype line is more complicated.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"  
"http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">  
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en">
```

This is in fact specifying a XML document. XHTML is defined by using XML therefore it is a XML document. There are different sub-versions too, e.g. xhtml10, xhtml11, etc. The exact grammar of a (sub)version is defined in a DTD.

HTML5 simplifies the doctype line.

```
<!DOCTYPE html>  
<html lang="en">
```

Sometimes known as html syntax but it could be written as xhtml syntax too (perhaps W3C recognized HTML5 under its xhtml framework)

```
<!DOCTYPE html>  
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en">
```

Not commonly used, may cause some subtle difference in browser rendering.

3.6. Web Page Validation

How do we know our Web page is written correctly? The browser will know but modern browser tends to be tolerant and recover any error found. Since all mark up languages have a well defined grammar, they can be checked.

Verifying the mark up in a page according to the version is called **validation**. Most editing tools perform syntax checking but some subtle errors can only be found by checking against the standard or the DTD.

W3C provides a validation page in their Web site. 3 options are available:

- by URL
- file upload
- direct input

Convenient to use file upload in your testing and URL will be blocked by CS Lab firewall.



3.7. W3Schools Quick Reference

We only cover so far the common tags which are used most of the time. Together with other tags, these can be grouped for easier quick reference:

- meta, style, structure and list
- basic, image, links and form
- table and frame
- style related

The information are from w3schools (XHTML) and the Web site would have the most update (HTML5) information.

3.7.1. Quick Reference 1 | **Tags by category - https://www.w3schools.com/tags/ref_byfunc.asp**

3.7.1. Quick Reference 1

Meta, style, structure and list

Meta Info		
<head>	Defines information about the document	STF
<title>	Defines the document title	STF
<meta>	Defines metadata about an HTML document	STF
<base />	Defines a default address or a default target for all links on a page	STF
<basefont />	Deprecated. Defines a default font, color, or size for the text in a page	TF

Styles and Structure		
<style>	Defines style information for a document	STF
<div>	Defines a section in a document	STF
	Defines a section in a document	STF

Lists		
	Defines an unordered list	STF
	Defines an ordered list	STF
	Defines a list item	STF
<dir>	Deprecated. Defines a directory list	TF
<dl>	Defines a definition list	STF
<dt>	Defines a term (an item) in a definition list	STF
<dd>	Defines a description of a term in a definition list	STF

3.7.2. Quick Reference 2 - deprecated

3.7.2. Quick Reference 2 - Deprecated

Basic, image, links and form

- note the term **deprecated** which means outdated and will not be supported in the future
- these tags should be used in writing new pages
- old ones should be changed if feasible

Ordered by Function

DTD: indicates in which [HTML 4.01/XHTML 1.0 DTD](#) the tag is allowed. S=Strict, T=Transitional, and F=Frameset

Tag	Description	DTD
Basic		
<!DOCTYPE>	Defines the document type	STF
<html>	Defines an HTML document	STF
<body>	Defines the document's body	STF
<h1> to <h6>	Defines HTML headings	STF
<p>	Defines a paragraph	STF

	Inserts a single line break	STF
<hr />	Defines a horizontal line	STF
<!--...-->	Defines a comment	STF

Images		
	Defines an image	STF
<map>	Defines an image-map	STF
<area />	Defines an area inside an image-map	STF
Links		
<a>	Defines an anchor	STF
<link />	Defines the relationship between a document and an external resource	STF

Forms		
<form>	Defines an HTML form for user input	STF
<input />	Defines an input control	STF
<textarea>	Defines a multi-line text input control	STF
<button>	Defines a push button	STF
<select>	Defines a select list (drop-down list)	STF
<optgroup>	Defines a group of related options in a select list	STF
<option>	Defines an option in a select list	STF
<label>	Defines a label for an input element	STF
<fieldset>	Defines a border around elements in a form	STF
<legend>	Defines a caption for a fieldset element	STF
<isindex>	Deprecated. Defines a searchable index related to a document	TF

3.7.3. Quick reference 3

3.7.3. Quick Reference 3

T

able and frame

- **frame** and **frameset** are no longer used in HTML5

Tables		
<table>	Defines a table	STF
<caption>	Defines a table caption	STF
<th>	Defines a header cell in a table	STF
<tr>	Defines a row in a table	STF
<td>	Defines a cell in a table	STF
<thead>	Groups the header content in a table	STF
<tbody>	Groups the body content in a table	STF
<tfoot>	Groups the footer content in a table	STF
<col />	Defines attribute values for one or more columns in a table	STF
<colgroup>	Defines a group of columns in a table for formatting	STF

Frames		
<frame />	Defines a window (a frame) in a frameset	F
<frameset>	Defines a set of frames	F
<noframes>	Defines an alternate content for users that do not support frames	TF
<iframe>	Defines an inline frame	TF

Links		
<a>	Defines an anchor	STF
<link />	Defines the relationship between a document and an external resource	STF

3.7.4. Style related tags

3.7.4. Style Related Tags

Some of the tags in this group are in fact style related, i.e. used to present some appearance setting. They should not be used as we shall learn mixing styling and HTML is not a good practice. CSS styling should be used. Some attributes also have this characteristic, e.g. width, height, border, etc.

Other tags may not be clear cut and should be used with care. Keeping things simple is a good guideline.

Formatting		
<u><acronym></u>	Defines an acronym	STF
<u><abbr></u>	Defines an abbreviation	STF
<u><address></u>	Defines contact information for the author/owner of a document	STF
<u></u>	Defines bold text	STF
<u><bdo></u>	Defines the text direction	STF
<u><big></u>	Defines big text	STF
<u><blockquote></u>	Defines a long quotation	STF
<u><center></u>	Deprecated. Defines centered text	TF
<u><cite></u>	Defines a citation	STF
<u><code></u>	Defines computer code text	STF
<u></u>	Defines deleted text	STF
<u><dfn></u>	Defines a definition term	STF
<u></u>	Defines emphasized text	STF
<u></u>	Deprecated. Defines font, color, and size for text	TF
<u><i></u>	Defines italic text	STF
<u><ins></u>	Defines inserted text	STF
<u><kbd></u>	Defines keyboard text	STF
<u><pre></u>	Defines preformatted text	STF
<u><q></u>	Defines a short quotation	STF
<u><s></u>	Deprecated. Defines strikethrough text	TF
<u><samp></u>	Defines sample computer code	STF
<u><small></u>	Defines small text	STF
<u><strike></u>	Deprecated. Defines strikethrough text	TF
<u></u>	Defines strong text	STF
<u><sub></u>	Defines subscripted text	STF
<u><sup></u>	Defines superscripted text	STF
<u><tt></u>	Defines teletype text	STF
<u><u></u>	Deprecated. Defines underlined text	TF
<u><var></u>	Defines a variable part of a text	STF
<u><xmp></u>	Deprecated. Defines preformatted text	

3.8. Conclusions

Critical Thinking :

- Should I memorize all HTML tags ?
- How to deal with all these standards?
- Which one should I choose?

Extension Reading: A History of HTML

Many other elements are not covered, there are many reference Web sites & books :

- www.w3schools.com
- www.whatwg.org
- W3C's HTML5 recommendation

2. HTML - part I | A history of HTML - <http://www.w3.org/People/Raggett/book4/ch02.html> | w3schools - <http://w3schools.com> | WHATWG - <http://www.whatwg.com> | W3C HTML5 recommendation - <http://dev.w3.org/html5/html-author/#the-html-element>