COSC 122
Computer Fluency

HTML

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Key Points

1) Hypertext Markup Language (HTML) is the standard language for building web pages.

2) HTML is our first example of a language for communicating instructions to the computer.

Hypertext Markup Language (HTML)

Hypertext Markup Language (*HTML*) is a language for describing how a web page appears in a web browser.

◆ HTML describes the layout of a document including fonts, text style, image placement, and hypertext links.

An HTML document looks like a regular text document except that it contains *tags* which are words or abbreviations enclosed in angle brackets: **<** and **>** .

◆ Each tag controls some appearance of the web page.

◆ In HTML 5, tags are not case-sensitive.

⇨ We will use lower case as convention.

◆ Tags **usually** come in pairs such as:

```
<p>Hello world!</p>
```

HTML "Hello World!" Example

```
<!DOCTYPE html>


<html>  ⟵—— Start of document
<head>
<title>Hello World using HTML</title>
</head>


<body>


<p>Hello world!</p>


</body>
</html>  ⟵—— End of document
```

Start of document

Beginning material such as title in head

Content of document goes in body

Text formatted using paragraph <P> tags.

HTML "Hello World!" Example (2)

Hello World using HTML

https://people.ok.ubc.ca/rlawrenc/teaching/122/Notes/Code/HTML/helloWorld.html

Hello world!

HTML Source Code

view-source:https://people.ok.ubc.ca/rlawrenc/teaching/122/Notes/Code/HTML/helloWc

```
1  <!DOCTYPE html>
2  <html>
3  <head>
4  <title>Hello World using HTML</title>
5  </head>
6
7  <body>
8
9  <p>Hello world!</p>
10
11 </body>
12 </html>
13
```
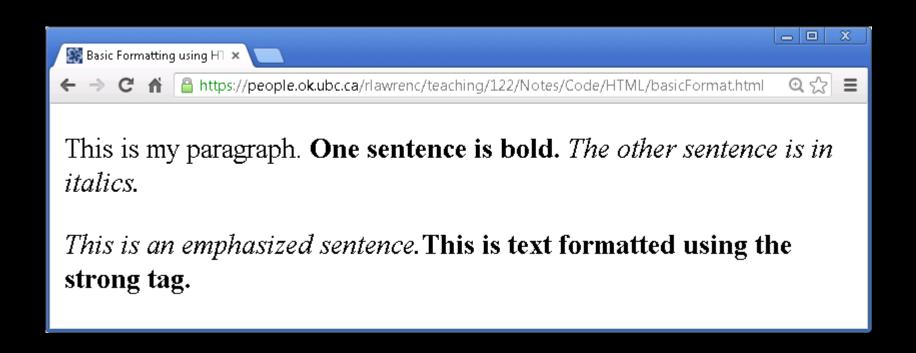
Basic Formatting Tags

To put text in a *paragraph* use the `<p> </p>` tags:

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

To make text *bold* use the `<b> </b>` tags:

`<b>This text is bold.</b>`

To make text *italic* use the `<i> </i>` tags:

`<i>This text is in italics.</i>`

To identify important text use the `<strong> </strong>` tags:

`<strong>This text is in strong format.</strong>`

To emphasize text use the `<em> </em>` tags:

`<em>This text is emphasized.</em>`

HTML Formatting Example

```
<!DOCTYPE html>

<html>
<head>
<title>Basic Formatting using HTML</title>
</head>

<body>

<p>This is my paragraph.  <b>One sentence is bold.</b>
<i>The other sentence is in italics.</i></p>

<p><em>This is an emphasized sentence.</em><strong>This is text
formatted using the strong tag.</strong></p>

</body>
</html>
```

HTML Formatting Example (2)

More Formatting Tags

You can apply more than one formatting at a time:

```
<p><b><i>This text is in bold and italics.</i></b></p>
```

There are 6 levels of heading defined **<h1>**, **<h2>**, .. **<h6>**. Each heading creates a new line and displays in a large font.

```
<h1>Largest heading</h1>
<h2>Next largest heading</h2>
<h6>Lowest level heading</h6>
```

Use **<hr>** to put a horizontal line in the document.

Use **
** to put a line break.

◆ Note that these last two do not have a closing tag.

Display vs. HTML Format

When displaying an HTML document, a web browser **ignores** white space. **White space is considered spaces, tabs, and newlines**. Multiple spaces and newlines are replaced with a single space when displayed (unless the **`<pre></pre>`** tags are used).

Since white space is ignored, it is advisable to make your HTML document easier to read and edit by inserting spaces and blank lines.

Remember the web browser uses the tags to determine how to display the document, not what it looks like in your editor!

Special Symbols

Since the **<** and **>** are special (reserved) symbols in the HTML language, we need a way to use them in our documents.

The **&** (ampersand) is the escape symbol that tells HTML a special character is required. Terminate with a **;** (semi-colon).

Common characters:

```
&lt;            <
&gt;            >
&amp;           &
&copy;          ©

&eacute;        é
&ntilde;        ñ

           non-breaking space
```

Text Alignment

You can left, right, or center a paragraph text by:

```
<p style="text-align:center">This text is centered.</p>
```
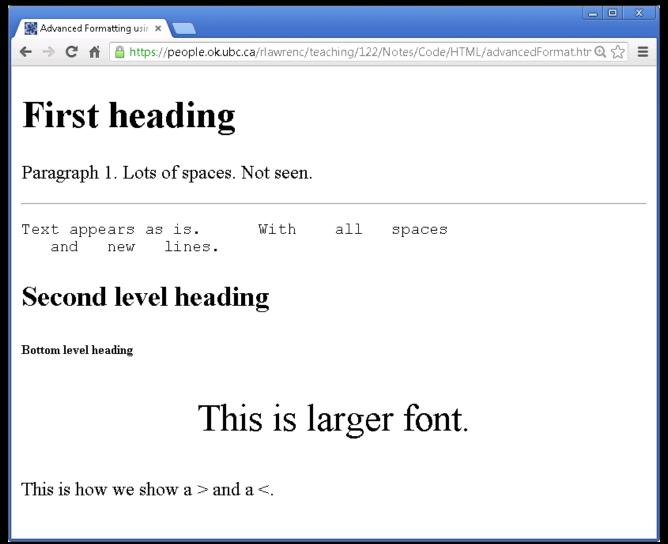
In general, *attributes* of tags are specified by providing their name and their value.

```
<p>Regular font.<br></p>
<p style="font-size:200%">Font twice as large!</p>
```

HTML Advanced Formatting Example

```
<!DOCTYPE html>
<html>
<head><title>Advanced Formatting using HTML</title></head>
<body>
<h1>First heading</h1>
<p>Paragraph 1.     Lots of spaces.      Not seen.</p>
<hr>
<pre>
Text appears as is.      With    all    spaces
   and    new    lines.
</pre>
<h2>Second level heading</h2>

<h6>Bottom level heading</h6>
<p style="text-align:center;font-size:200%">This is larger
font.</p>
<p>This is how we show a &gt; and a &lt;.</p>
</body>
</html>
```

HTML Advanced Formatting Example (2)

General Syntax Rules: Comments

Comments are used by the programmer to document and explain the code. Comments are ignored by the computer.

HTML comments use the syntax "`<!--`" for the start of the comment and "`-->`" for the end of the comment.

Example:

```
<!-- This is a HTML comment -->
<!-- This is a HTML comment
     that crosses
       multiple lines -->
```

HTML Tags

Question: Select *one* of the tags that do not have a matching closing tag.

A) `br`

B) `h1`

C) `hr`

D) `p`

HTML Tags – No Formatting

Question: Which one of these tags will display text "as-is" in your document with line breaks, spaces, etc.?

A) `p`

B) `hr`

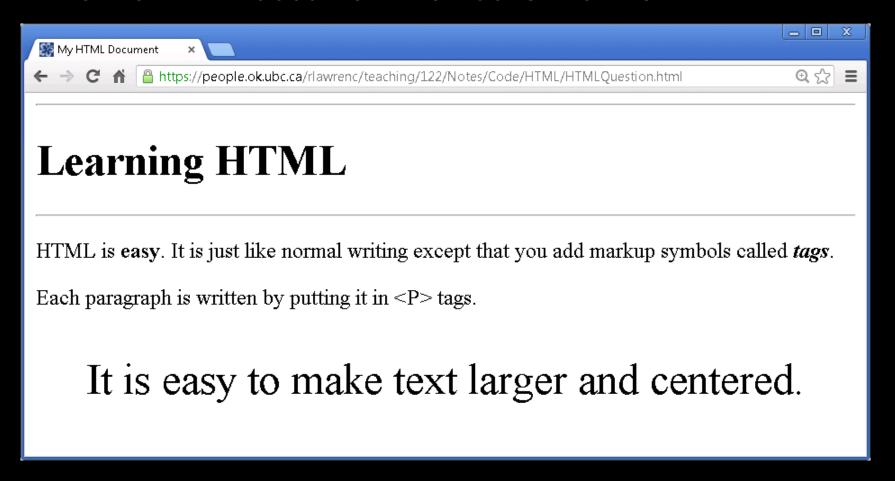**C)** `pre`

D) `b`

HTML Tags – Reserved Symbols

Question: Which one of these symbols is ***not*** reserved?

A) <

B) ,

C) >

D) &

HTML Practice Question 1: Basics

Write the HTML document that looks like this:

Marking Links With Anchor Tags

Anchor tags are used to create hyperlinks in the document.

An anchor tag has two components:

- ◆ **Anchor text** – the text in the document that is highlighted
- ◆ **Hyperlink reference** – address of web page to link to

Example:

```
<a href="http://www.yahoo.com">Go to Yahoo!</a>
```

Hyperlink
(where to go to)

Text the user sees
to click on

Hyperlinks - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Hyperlinks

Go to Yahoo!

http://www.yahoo.com/

Specifying A Hyperlink Location Absolute and Relative Paths

The location where the user goes to when clicking on the link may be given as a complete *absolute* URL:

```
<a href="http://www.yahoo.com">Go to Yahoo!</a>
```

or *relative* to the current location:

```
<a href="mydir/helloWorld.html">Go to Hello World in mydir</a>
```

Use an absolute URL when the page is on a different server.

Use a relative path when the page is on the same machine. The path depends on the current page location.
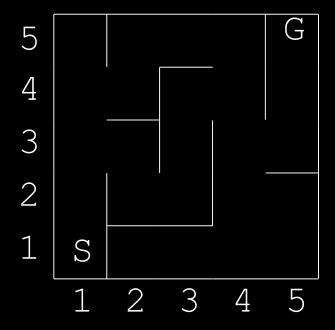
◆ Use ".." to navigate to the directory above your current location.

Analogy: If you give someone directions to the Science building, those directions will depend on where you start from!

Absolute and Relative Paths Question

Given this maze, specify the location of the goal (G) both in absolute terms and relative based on start location (S).
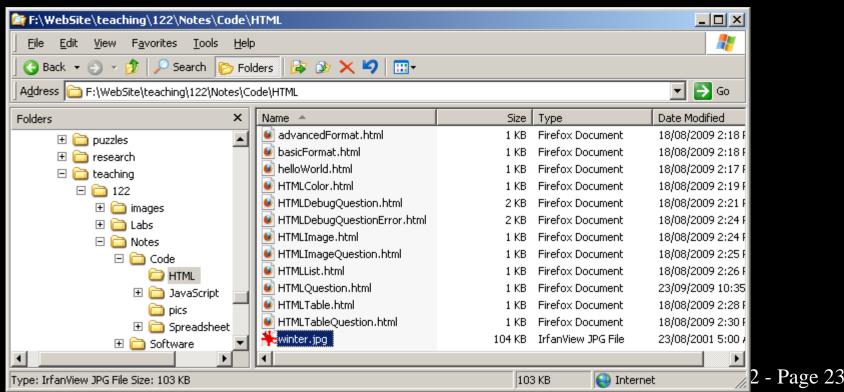
◆ Describe the path how you want.

Absolute and Relative Paths Question 2

Given these files, specify the location of the file `winter.jpg`:

- absolutely

- relative to directory `122`   (directory 122 is the start point)

- relative to directory `pics`

Including Pictures With Image Tags

Images can be shown in a document with the image `<img>` tag:

```
<img src="imgs/winter.jpg"/>
<img src="http://www.google.ca/intl/en_ca/images/logo.gif"/>
```

Notes:

- ◆ `src` stands for source and is either an absolute or relative path to a picture file.

- ◆ A picture may be in many different formats. Common formats:
    - ⇨ GIF: Graphic Interchange Format
    - ⇨ JPEG: Joint Photographic Experts Group
    - ⇨ PNG: Portable Network Graphics

- ◆ The file extension (.gif, .jpg, .png) tells the browser which format the image is stored in.

Positioning the Image in the Document

By default, images are inserted in the page at the point where the tag is specified in the HTML, and the text lines up with the bottom of the image.

The align attribute can line up image with the top of the line of text or the bottom.

Align left or right attribute puts the image on the side of the browser window and the text flows around it.

To put image on separate line, enclose within paragraph tags.

Advanced: Images and Links Together

You can create a hyperlink on an image so when the user clicks on the image, they go to the desired location.

Example:

```
<a href="http://www.google.ca">
<img src="http://www.google.ca/intl/en_ca/images/logo.gif"/>
</a>
```
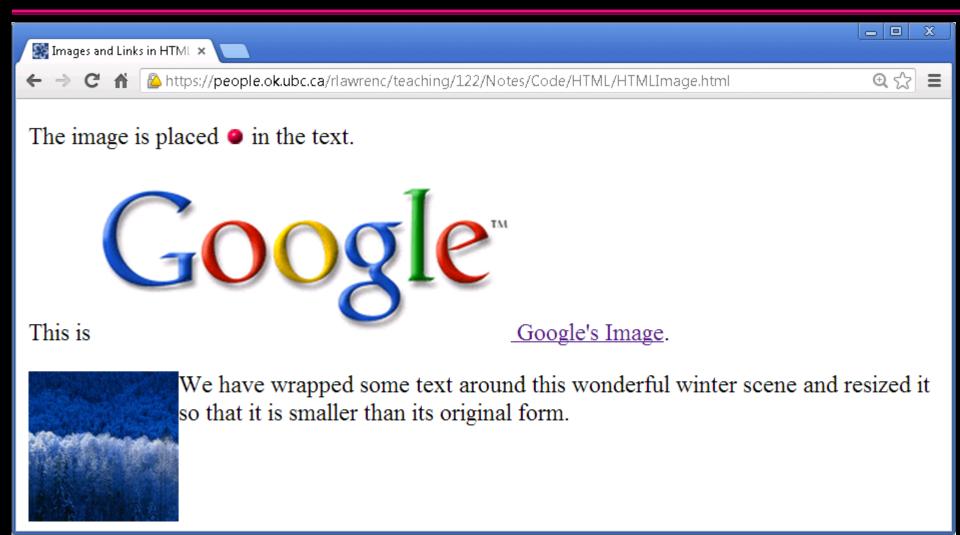
◆ This example shows an image retrieved from Google's web site and will go to the web site when the image is clicked.

◆ Note that we could have sent the user to any site, not just the Google site where the image came from.

HTML Image and Link Example

```
<html>

<head><title>Images and Links in HTML</title></head>
<body>

<p>The image is placed <img src="../../../images/redball.gif"/>
in the text.</p>

<p>This is <a href="http://www.google.ca">
<img src="http://www.google.ca/intl/en_ca/images/logo.gif"/>
Google's Image</a>.</p>

<p><img align="left" width="100" height="100" src="winter.jpg"/>
We have wrapped some text around this wonderful winter scene and
resized it so that it is smaller than its original form.</p>

</body>
</html>
```

HTML Image and Link Example (2)

Handling Color

Color is used for both background and text. A color is specified either by name (red, yellow, orange) or by *hexadecimal* RGB color numbers.

- ◆ `background-color` defines the background color.

- ◆ `color` is text color.

Examples:

```
<body style="background-color:silver;color:yellow">
<p style="color:red">Red font</p>
<p style="color:#FF8E2A">Orange font</p>
```

To set link color (put this before the body tag):

```
<style>
a:link { color: orange }
a:visited { color: green }
a:active  { color: orange }
</style>
```

Advanced: Specifying Color by Number

When a color is specified by a hexadecimal number it consists of three numbers from 0 to 255 representing the intensity of red, green, and blue respectively.

◆ However, instead of using decimal numbers (base 10), hexadecimal numbers are used (base 16) which have the digits 0 to 9 plus A (10), B (11), C (12), D (13), E (14), and F (15).

Examples:

Color	RGB Intensity	Hexadecimal
Black	(0, 0, 0)	#000000
White	(255, 255, 255)	#FFFFFF
Red	(255, 0 , 0)	#FF0000
Green	(0, 255, 0)	#00FF00
Blue	(0, 0, 255)	#0000FF
Orange	(255, 142, 42)	#FF8E2A
Purple	(147, 112, 219)	#9370DB
Yellow	(255, 255, 0)	#FFFF00

HTML Anchor Tag

Question: Which one of these anchor tags is correct?
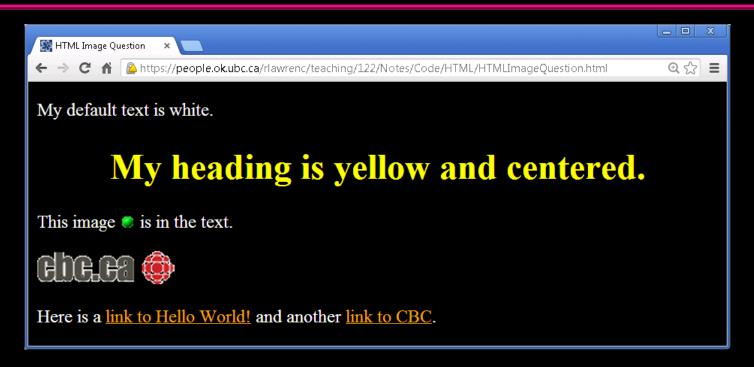
a) `<a ref="Click Here">http://www.yahoo.com</a>`

b) `<a href="index.html">My Home Page</a>`

c) `<a src="http://www.yahoo.ca">Yahoo</a>`

d) `<a ref="http://www.google.ca" src="My Page">`

HTML Image Tag

Question: Which one of these image tags is correct?

a) `<img "picture.gif"/>`

b) `<img>picture.gif</img>`

c) `<img ref="picture.gif"/>`

d) `<img src="picture.gif"/>`

HTML Practice Question 2: Images

◆The background is black. Image and link locations:
  ⇨greenball.gif – relative path 4 directories up then in `images` directory
  ⇨CBC logo – `http://www.cbc.ca/logo.gif`
  ⇨helloWorld link – `helloWorld.html` is in current directory
  ⇨CBC link – `http://www.cbc.ca`

Lists in HTML

It is possible to create both bulleted and numbered lists.

For a bulleted list, use the tags **`<ul></ul>`** and **`<li></li>`**:

```
<ul>
    <li>Item 1</li>
    <li>Item 2</li>
    <li>Item 3</li>
</ul>
```

For a numbered list, use the tags **`<ol></ol>`** and **`<li></li>`**:

```
<ol>
    <li>Item 1</li>
    <li>Item 2</li>
    <li>Item 3</li>
</ol>
```

Advanced Lists

You can nest lists inside each other to produce sublists:

```
<ul>
  <li>Item 1
    <ol>
        <li>Subitem 1.1</li>
        <li>Subitem 1.2</li>
    </ol>
  </li>
</ul>
```
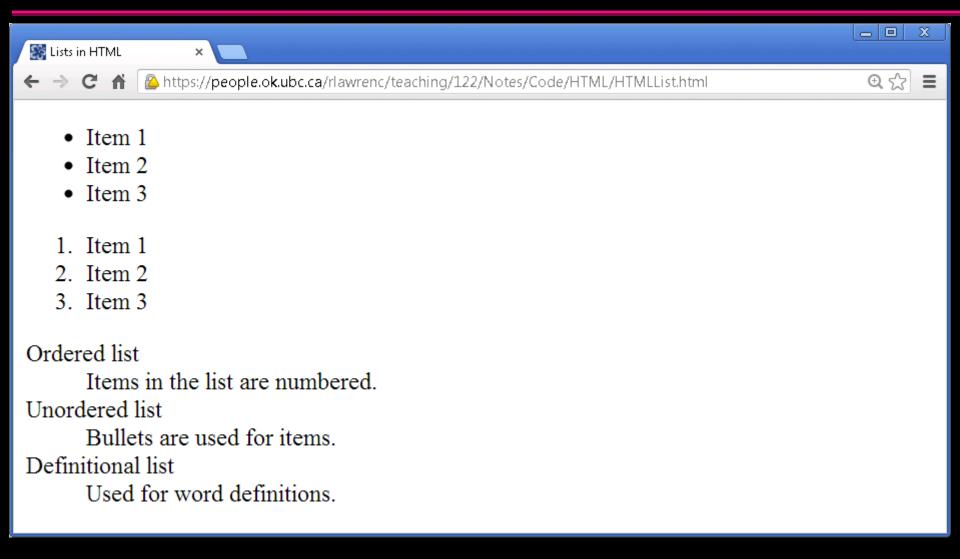
Another type of list is the *definitional list*:

◆ **<dl>** and **</dl>** tags begin and end the list

◆ **<dt>** and **</dt>** surround the terms to be defined

◆ **<dd>** and **</dd>** surround the definitions

HTML List Example

```
<html><head><title>Lists in HTML</title></head>
<body>
<ul>
   <li>Item 1</li>
   <li>Item 2</li>
   <li>Item 3</li>
</ul>
<ol>
   <li>Item 1</li>
   <li>Item 2</li>
   <li>Item 3</li>
</ol>
<dl>
   <dt>Ordered list</dt><dd>Items in the list are numbered.</dd>
   <dt>Unordered list</dt><dd>Bullets are used for items.</dd>
   <dt>Definitional list</dt><dd>Used for word definitions.</dd>
</dl>
</body>
</html>
```

HTML List Example (2)

Tables in HTML

Data can be displayed in tables using the `<table></table>` tags. Rows are enclosed in table row `<tr></tr>` tags, and each cell is denoted using table data `<td></td>` tags.

A table may have a caption centered at the top of the table by using the `<caption></caption>` tags.

A header row may be created using the `<th></th>` tags.
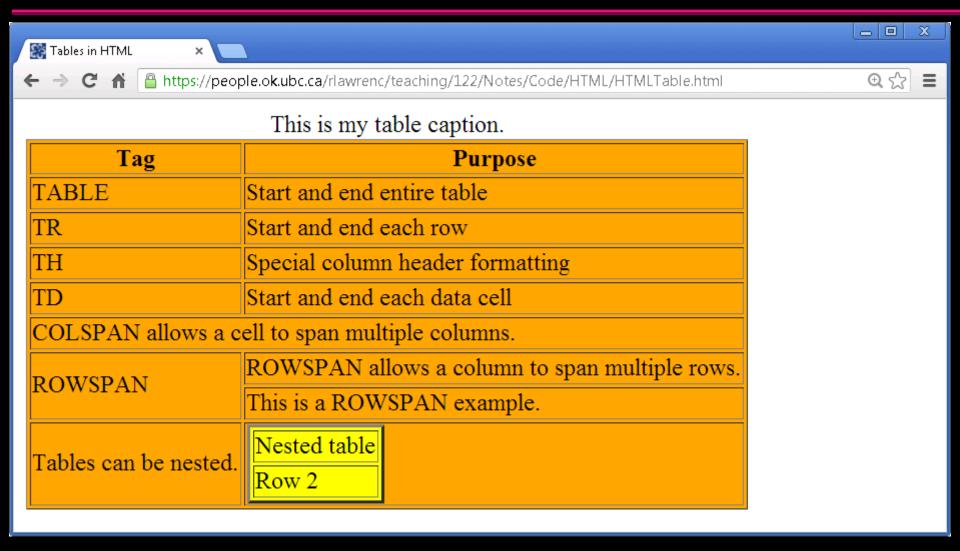
HTML Table Example

```
<html><head><title>Tables in HTML</title></head><body>
<table border="1" style="background-color:orange">    ← Table with border
  <caption>This is my table caption.</caption>
<tr><th>Tag</th><th>Purpose</th></tr>    ← Header row
  <tr><td>TABLE</td><td>Start and end entire table</td></tr>
  <tr><td>TR</td><td>Start and end each row</td></tr>
  <tr><td>TH</td><td>Special column header formatting</td></tr>
  <tr><td>td</td><td>Start and end each data cell</td></tr>
  <tr><td colspan="2">COLSPAN allows a cell to span multiple
columns.</td></tr>
   <tr><td rowspan="2">ROWSPAN</td><td>ROWSPAN allows a column
to span multiple rows.</td></tr>
   <tr><td>This is a ROWSPAN example.</td></tr>
   <tr><td>Tables can be nested.</td><td>
      <table border="2" style="background-color:yellow">
         <tr><td>Nested table</td></tr>
         <tr><td>Row 2</td></tr></table>    ⎫ Nested
   </td></tr>                                 ⎬ table
</table></body></html>                        ⎭
```

HTML Table Example (2)

https://people.ok.ubc.ca/rlawrenc/teaching/122/Notes/Code/HTML/HTMLTable.html

This is my table caption.

Tag	Purpose
TABLE	Start and end entire table
TR	Start and end each row
TH	Special column header formatting
TD	Start and end each data cell
COLSPAN allows a cell to span multiple columns.	
ROWSPAN	ROWSPAN allows a column to span multiple rows.
	This is a ROWSPAN example.
Tables can be nested.	Nested table / Row 2

Where can I use HTML?

HTML is everywhere on the Internet: UBC Connect, Facebook, Yahoo, Google, etc.

All your most popular websites have HTML as a base (and maybe other languages on top of them.)

You can see the HTML source for any page in a browser by selecting `View->Page Source` in Firefox/Chrome or `View->Source` in Internet Explorer.

The idea of ***markup*** in HTML is common to many environments and languages.

Advanced: Style Attribute

The `style` attribute can be added to a tag to control its appearance. Different settings are separated by semi-colons.

Example:

```
<body style = "background-color:black; color: white;">
```

Some common style settings:

- background-color e.g. background-color:yellow
- font-family   e.g. font-family:"Times New Roman",Serif;
- font-style   e.g. font-style:italic
- font-size   e.g. font-size:100%
- color   e.g. color:red;
- text-align   e.g. text-align:center

Advanced: Cascading Style Sheets

Cascading style sheets (CSS) is a language for controlling the appearance of web pages, especially color, layout, and fonts.

How it works:

- ◆ In a CSS source, you define the markup tag and its formatting.
- ◆ When that tag is used in your HTML page, the formatting is automatically applied. This makes changes easier!

Example:

```
<html><head><title>Using CSS</title></head>
<style type="text/css">
  body { font-family: "Times New Roman"; color: purple;}
  h1 { font-family: Helvetica; color: green;}
</style>
<body>
<h1>Formatted heading</h1>
<p>Regular text</p>
</body></html>
```

Advanced: Three Types of Selectors

By element - Apply to all instances of a particular element:

```
h1 { font-family: Helvetica; color: red;}

Use:

<h1>This will be red</h1>
```

By id - Apply to all content with a specific id:

```
#section {text-align: left; background-color: blue;}

Use:

<div id="section"><h1>Heading</h1><p>Text..</p></div>
```

By class - Apply to specified instances of any tag:

```
h1 { color: green;}

h1.red { color: red;}

Use:

<h1>This will be in green</h1>   <h1 class="red">R
```

HTML List Tag

Question: Which one of these HTML code fragments will produce a list like below?

```
1.   Item 1
2.   Item 2
```

a)
```
<ol>
  <li>Item 1</li>
  <li>Item 2</li>
</OL>
```

b)
```
<ul>
  <li>Item 1</li>
  <li>Item 2</li>
</ul>
```

c)
```
<ol>
  <il>Item 1</il>
  <il>Item 2</il>
</ol>
```

d)
```
<ul>
  <ol>Item 1</ol>
  <ol>Item 2</ol>
</ul>
```

HTML Table Tag

Question: Which one of these HTML code fragments will produce a table like this?

Heading 1	Heading 2
Val1	Val2

a) `<table border="1">`
`<tr><th>Heading 1</th><th>Heading 2</th></tr>`
`<tr><td>Val1</td><td>Val2</td></tr>`
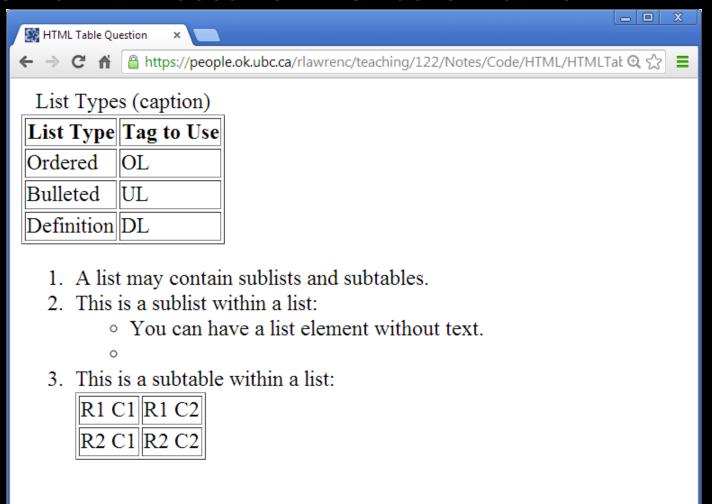`</table>`

b) `<table border="2">`
`<tr><td>Heading 1</td><td>Heading 2</td></tr>`
`<tr><dt>Val1</dt><dt>Val2</dt></tr>`
`</table>`

HTML Practice Question 3: Lists & Tables

Write the HTML document that looks like this:

Conclusion

Hypertext Markup Language (*HTML*) is a language for describing how a web page should appear in a web browser.

We have seen how we can use markup tags of HTML to:
- change fonts and formatting
- add images and hyperlinks
- create lists and tables

HTML is our first example of a language to instruct the computer on what to do.

Objectives

◆Define: HTML, tag

Remember the HTML syntax for:

◆Formatting tags: `<p>`, `<i>`, `<b>`, `<h1>` to `<h6>`, `<pre>`

◆Image and link tags: `<a>` and `<img>`

◆Special symbols using the escape character `&` (ampersand)

◆Changing colors and text alignment

◆Lists and tables

Be able to create HTML pages that have a given appearance.

Be able to draw what a HTML document will look like when displayed in a web browser.

Special Symbols

Since the **<** and **>** are special (reserved) symbols in the HTML language, we need a way to use them in our documents.

The **&** (ampersand) is the escape symbol that tells HTML a special character is required. Terminate with a **;** (semi-colon).

Common characters:

```
&lt;            <
&gt;            >
&amp;           &
&copy;          ©

&eacute;        é
&ntilde;        ñ

           non-breaking space
```