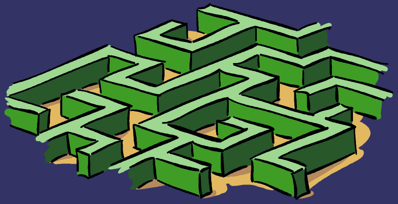
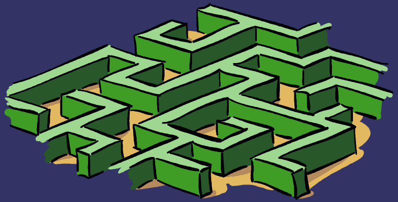
Lesson #2

Hyper Text Markup Language



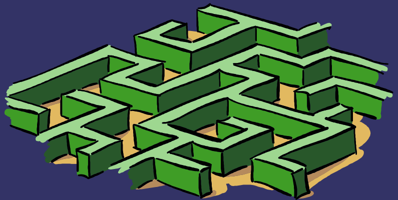
What is HTML?

- It is the base code for web pages.
- It creates a visual presentation that is displayed by a web browser.
- The commands in HTML coding (known as TAGS) are enclosed in angle brackets < >. The tags normally come as a set. One to open a command, and one to close it. Everything between the two tags will be affected by them. The closing tag uses a forward slash / in it.



HTML

- Tags are made up of elements, properties, and values. The command letters or words are called elements.
- Some elements have declared settings called properties. These properties help describe or shape the way the element will work or function. The property settings are known as values.
- Some tags can have many properties, others have none.

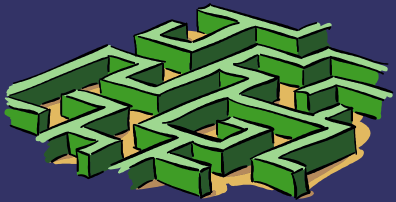


HTML 5

- HTML 5 is the latest version of HTML.

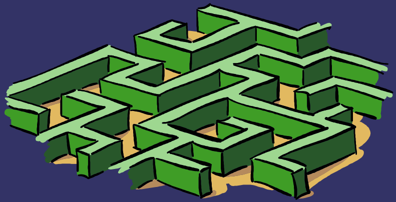
- To declare an HTML 5 page we need a Document Type Definition (DTD). It is very simple.

- `<!DOCTYPE html>`



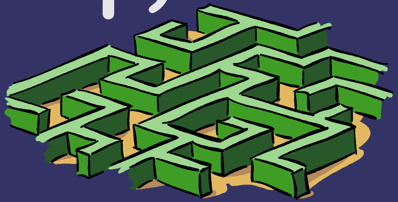
HTML 5 Skeleton

```
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="Content-type" content="text/
  html; charset=utf-8" />
<title>My first web page</title>
</head>

<body>
<div>This is my first web page.</div>
</body>
</html>
```



Skeleton Tags

- <html> HTML code.
- <head> An introduction to the web page. In this area, some of the settings for the web page are introduced such as the title, and information for search engines.
- <title> The title for the web page. It will appear in the title bar at the top of the browser window.
- <body> Main program section for web page. This is where it all happens. All body content must be inside content tags (like **div** or **p**).



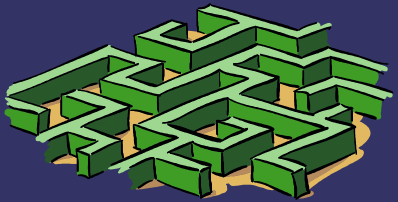
Character Sets

- A character encoding system (character set) consists of a code that pairs each character from a given repertoire with a bit pattern. The most common character sets are:

- **ISO-8859-1**: Latin alphabet. By far the most popular 8-bit character set in the world.

- **Windows-1252**: Latin alphabet, legacy of Microsoft products. Similar to ISO-8859-1 except for characters 128-159.

- **UTF-8**: Unicode. Contains not only latin alphabet but other world alphabets as well.



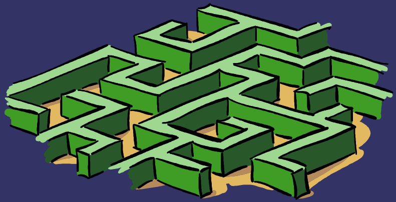
Comments

- The comment tag is used to insert a comment in the source code. A comment will be ignored by the browser. You can use comments to explain your code, which can help you when you edit the source code at a later date. Browsers ignore comments, unrecognisable tags, line breaks, multiple spaces, and tabs.

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

- Be careful to respect proper syntax (only two dashes at beginning and end).

```
<!----- Invalid comment ----->
<!-- --- Valid comment --- -->
```

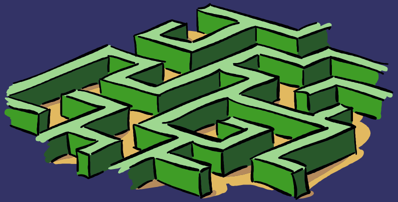


Colours

- Colours can be used as backgrounds, text colours, and more.

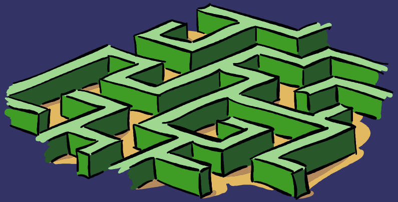
- Each colour is represented by a 6 character letter-number, an hexadecimal (hex) number. Using a hex number to display a colour requires the # symbol ahead of it. This lets the browser know that the following set of characters is a colour code.

- Colour names can also be used.



Colours

- Colours are expressed by 2 hex numbers per primary colour: RRGGBB
- The higher the value, the higher the intensity of that primary colour.
- Ranges go from 00 (no signal from that colour) to ff (full intensity).



Formatting tags

- Texts can be formatted using special tags. All text between those tags will be affected.

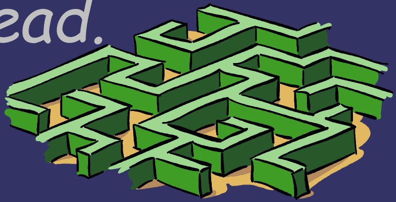
```
<strong> This text is bold. </strong>*
<em> This text is italicized. </em>*
<code> This text is teletyped. </code>*
```

This text is bold.

This text is italicized.

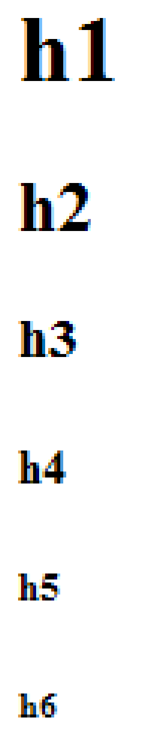
`This text is teletyped.`

- **Note:* These tags can become deprecated at any future version. It is highly recommended to use CSS instead.*



Formatting Tags

- Multiple tags can be nested.
- Tags should never overlap.
- Good: <div><p>Hello</p></div>
- Bad: <div><p>Hello</p></span>
- Header tags can be used for page and sections headings. <h1> is the largest text, <h6>, the smallest (by default).



h1

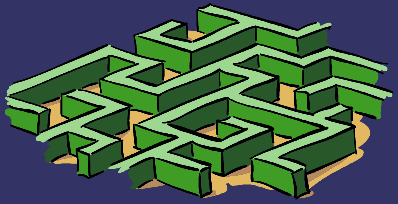
h2

h3

h4

h5

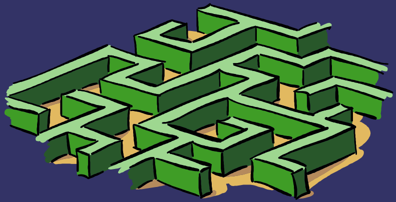
h6



Formatting Tags

- The text content of a <pre> element is displayed as it is entered preserving line changes and white space. However, the elements inside are still interpreted.

- The <blockquote> element is used to set a block of text off from the normal flow and appearance of text. Browsers often indent, and sometimes italicize. <em>, <strong>, and <code> are not affected if they appear in the content of a <blockquote>.

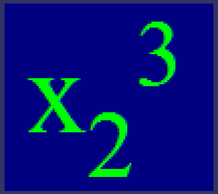


Formatting Tags

Superscripts and subscripts:

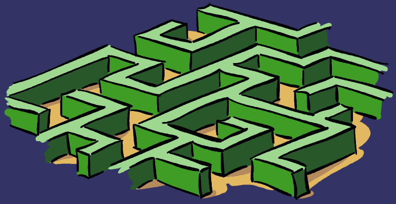
- Subscripts with <sub>
- Superscripts with <sup>

- Example: `x<sub>2</sub><sup>3</sup>`



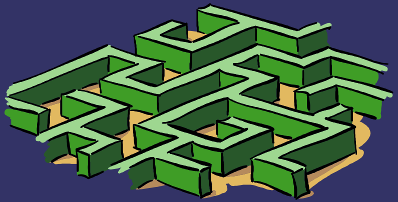
$x_2{}^3$

Note: Formatting tags are now less in use and replaced by more powerful CSS specifications.



Page sections

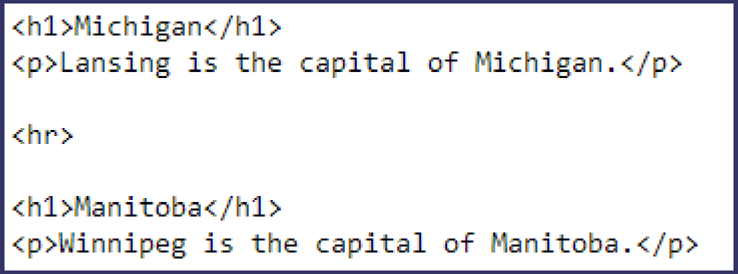
- <br>: Just a simple line break in the page.
- <div>....</div>: A division will share common characteristics and stand on its own.
- <p>...</p>: A paragraph will share common characteristics and will have empty line on top and bottom of it.
- <span>...</span>: A text will share common characteristics with no line breaks at all.



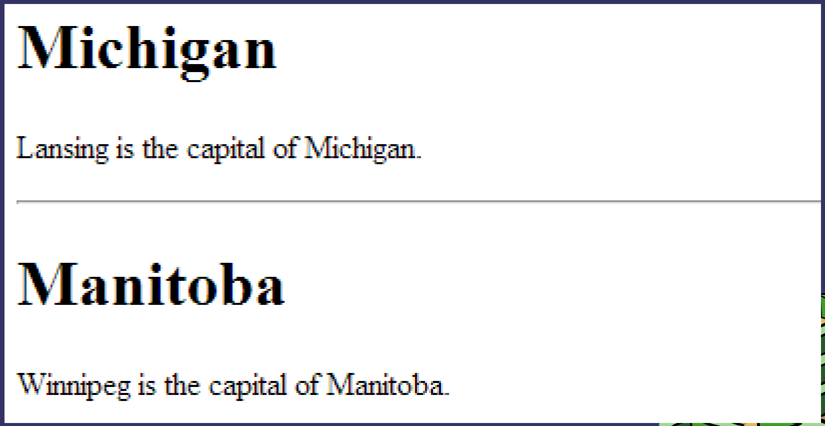
Horizontal Rule

- The <hr> is an easy way to create horizontal sections on your page. It creates a separator line that appears across the width of the screen. In HTML 5, the <hr> tag defines a thematic break

- *Note: <hr> has no attributes in HTML 5. The old attributes: width, size and noshade are deprecated.*



```
<h1>Michigan</h1>
<p>Lansing is the capital of Michigan.</p>

<hr>

<h1>Manitoba</h1>
<p>Winnipeg is the capital of Manitoba.</p>
```

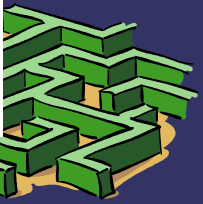


Michigan

Lansing is the capital of Michigan.

Manitoba

Winnipeg is the capital of Manitoba.



Fonts

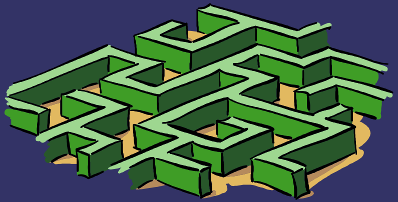
- Fonts and colours can be defined using CSS specifications and the style attribute.

Ex:

`<span style="color:#ffff00">Hello</span>` will give a yellow word.

`<span style="color:#ff0000;font-family:Arial">Hello</span>` will give a red word in Arial font.

- We'll explore CSS more in detail later.



Text alignment

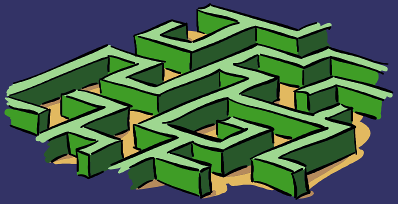
- Text alignment in HTML is done using CSS as well.

Ex:

```
<p style="text-align:center;">Hello</p>
```

will give

Hello



Lists

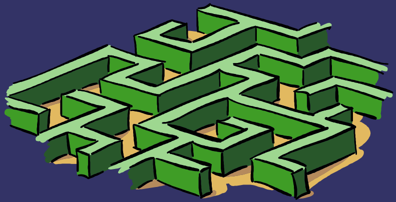
- ➲ Lists are a great way of keeping your web page organized. There are unordered (bullet) lists, ordered (numbered) lists, and definition lists. It will indent the information a bit making the list look organized and as a unit.

```
<ul >
<li> apples </li>
<li> oranges </li>
</ul>
```

- apples
- oranges

Blue URL means required reading!

See this page for more details on lists:
www.w3schools.com/html/html_lists.asp

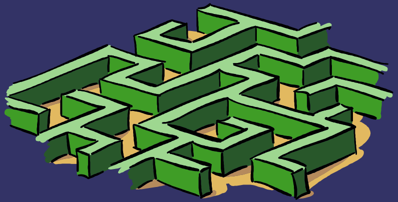


Ordered Lists

- ➲ This list type produces numerical characters on each line instead of a bullet characters.

```
<ol>
<li>Coffee</li>
<li>Tea</li>
</ol>
```

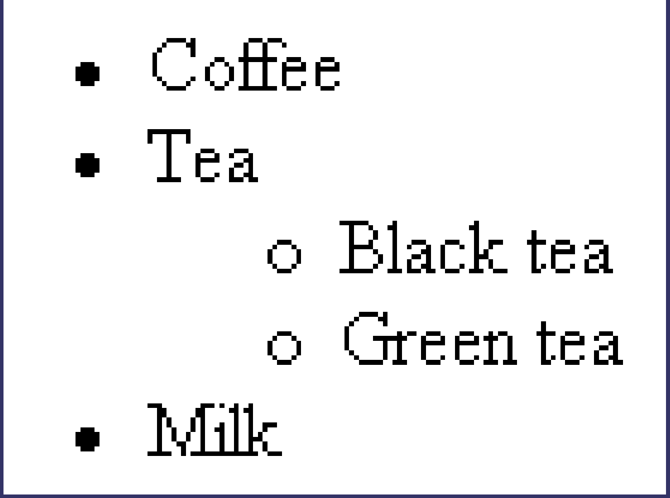
1. Coffee
2. Tea



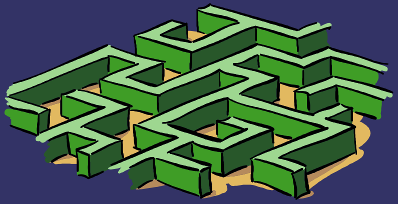
Nested Lists

➲ To be creative, you can create nested lists. These will create a list, inside another list. Each new list will be indented from the one before.

```
<ul>
  <li>Coffee</li>
  <li>Tea
    <ul>
    <li>Black tea</li>
    <li>Green tea</li>
    </ul>
  </li>
  <li>Milk</li>
</ul>
```



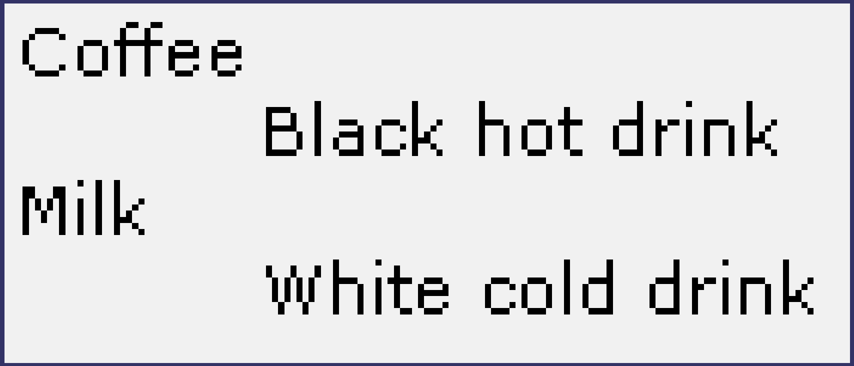
- Coffee
- Tea
  - Black tea
  - Green tea
- Milk



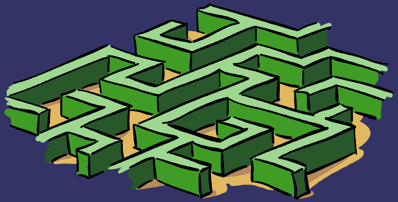
Defintion Lists

- This list type is a little different. It creates a title line (dt) and a data area (dd).

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



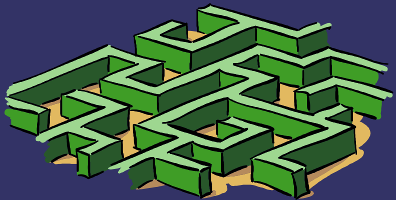
```
Coffee
        Black hot drink
Milk
        White cold drink
```



Images Formats

There are three main supported types of images. GIF, PNG and JPG. There are many other image types such as BMP, TIFF and PNG, but may have limited or no support with some browsers.

- GIF / PNG (Graphic Interchange Format / Portable Network Graphics):
  - GIF supports animation and transparency, limited to 256 colours.
  - PNG support transparency.
  - Best used for created images such as icons, buttons, etc.
- JPG (Joint Photographic Expert Group):
  - Able to contain millions of colours.
  - Best used for photographs.



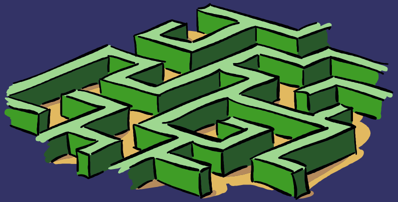
Images

- The <img> element defines an image.

- Two attributes are **required**: alt and src

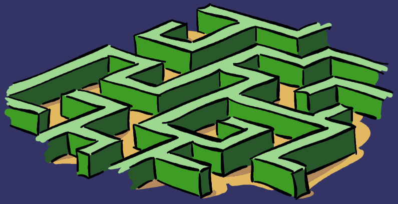
```
<img src="angry.gif" alt="Angry" />
```

img attributes:
src: the URL of the image.
alt: a short description of the image.
height: in pixels or %. Height of image.
width: in pixels or %. Width of image.



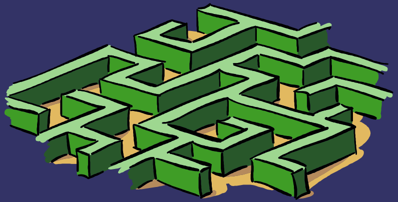
Links

- Links are used to "link" a visitor from one area to another. Both text and images are able to be used as a link source.
- A relative link uses a page name (including sub-directories if needed) as the target. It is local to the current server.
- An absolute link uses a URL as the target. The URL must be complete with protocol and all (https://).
- The internal or anchor link is useful for long pages. It is a link to another spot on the same page.



Links

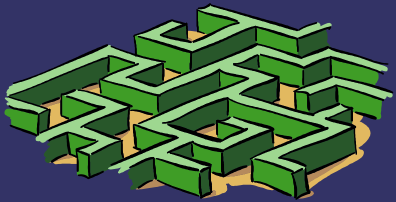
- Relative:
  - `<a href="page.html">Click here</a>`
  - `<a href="../pages/page.html">Click here</a>`
- Absolute:
  - `<a href="https://www.ryerson.ca/">Click here</a>`
- Internal:
  - `<a href="#top">Go to top</a>`
  - Need to add `<a name="top" />` at top of page.



The <meta> tag

- The <meta> element provides meta-information about your page, such as descriptions and keywords for search engines and refresh rates.
- The <meta> tag always goes inside the head element.
- Metadata is always passed as name/value pairs.
- Keywords (note that keywords are now ignored by search engines).

```
<meta name="keywords" content="HTML,
  DHTML, CSS, XML, XHTML, JavaScript" />
```



The <meta> tag

- A description of your web page (100-200 characters):

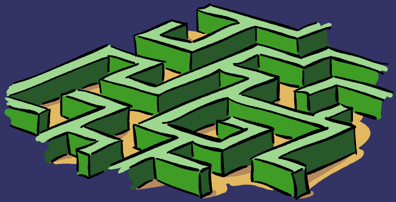
```
<meta name="description" content="Free Web
tutorials on HTML, CSS, XML, and XHTML" />
```

- Refresh page every 5 seconds:

```
<meta http-equiv="refresh" content="5" />
```

- Revision and author of page:

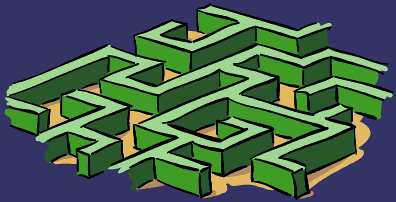
```
<meta name="revised" content="Ryerson
Universiy,3/6/18" />
```



The <meta> tag

- Redirecting a user to a new place after 5 seconds:

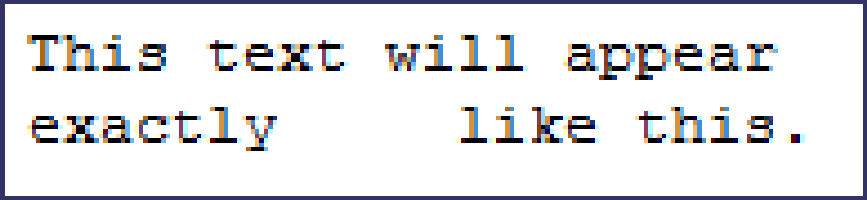
```
<meta http-equiv="Refresh"
 content="5;url=https://www.r
 yerson.ca" />
```



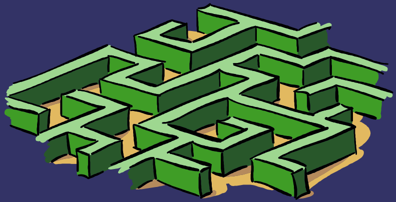
The <pre> tag

- The pre element defines pre formatted text. The text enclosed in the pre element usually preserves spaces and line breaks. The text renders in a fixed-pitch font.
- There is no attributes.

```
<pre>
This text will appear
exactly     like this.
</pre>
```

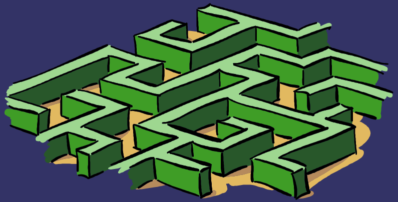


```
This text will appear
exactly     like this.
```



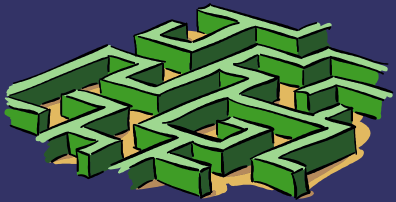
Special UTF-8 characters

- To make special characters and accented letters show up on your pages, use a special set of codes called character entities, which you insert into your HTML code and which your browser will display as the corresponding symbols or characters you want.
- See this page: www.w3schools.com/charsets/ref_html_utf8.asp



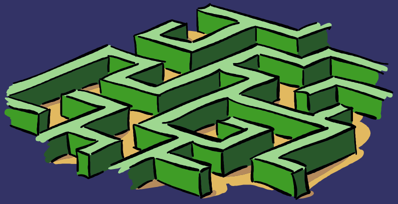
Tables: the <table> tag

- The <table> tag defines a table. Inside a <table> tag you can put table headers, table rows, table cells, and other tables. Its attributes are:
- **border**: the border width in pixels. For no border, border = "0"
- **cellpadding**: the space between the cell walls and contents in pixels or %.
- **cellspacing**: the space between the cells in pixels or %.



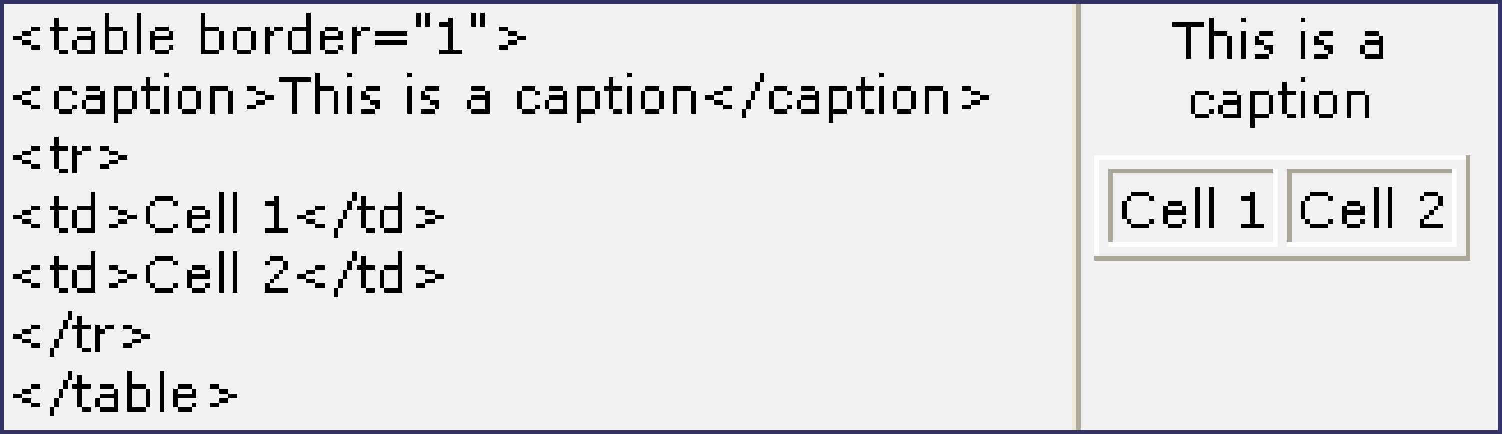
Tables: the <table> tag

- Other attributes are:
- **width**: The width of the table in % or pixels.
- **frame**: Specifies how the outer borders should be displayed.
- **rules**: Specifies the horizontal/vertical divider lines.
- *Rules and frame must be used in conjunction with the "border" attribute.*



Tables: The <caption> tag

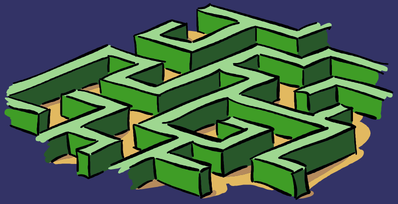
- This element defines a table caption. The <caption> tag must be inserted immediately after the <table> tag. You can specify only one caption per table. Usually the caption will be centered above the table.
- There is no attribute for this tag.



```
<table border="1">
<caption>This is a caption</caption>
<tr>
<td>Cell 1</td>
<td>Cell 2</td>
</tr>
</table>
```

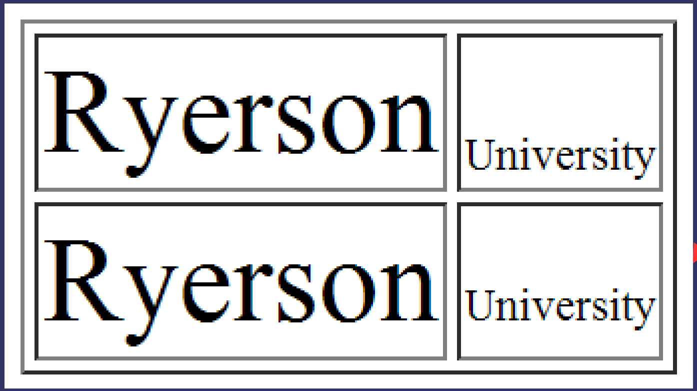
This is a caption

Cell 1	Cell 2

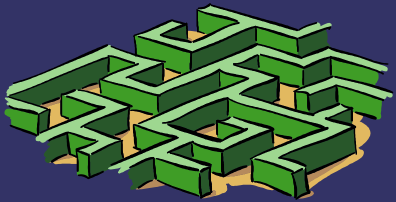


Tables: The <tr> tag

- Defines a row in a table. It contains <td> or <th> elements inside. Here are the attributes:
  - **align**: horizontal alignment inside cells. Possible values are right, left, center, justify and char.
  - **valign**: vertical alignment inside cells. Possible values are top, bottom, middle and baseline.

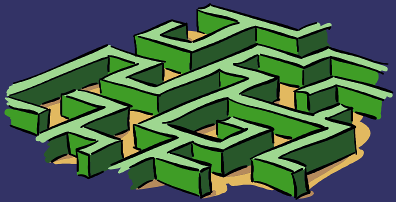


Ryerson	University
Ryerson	University

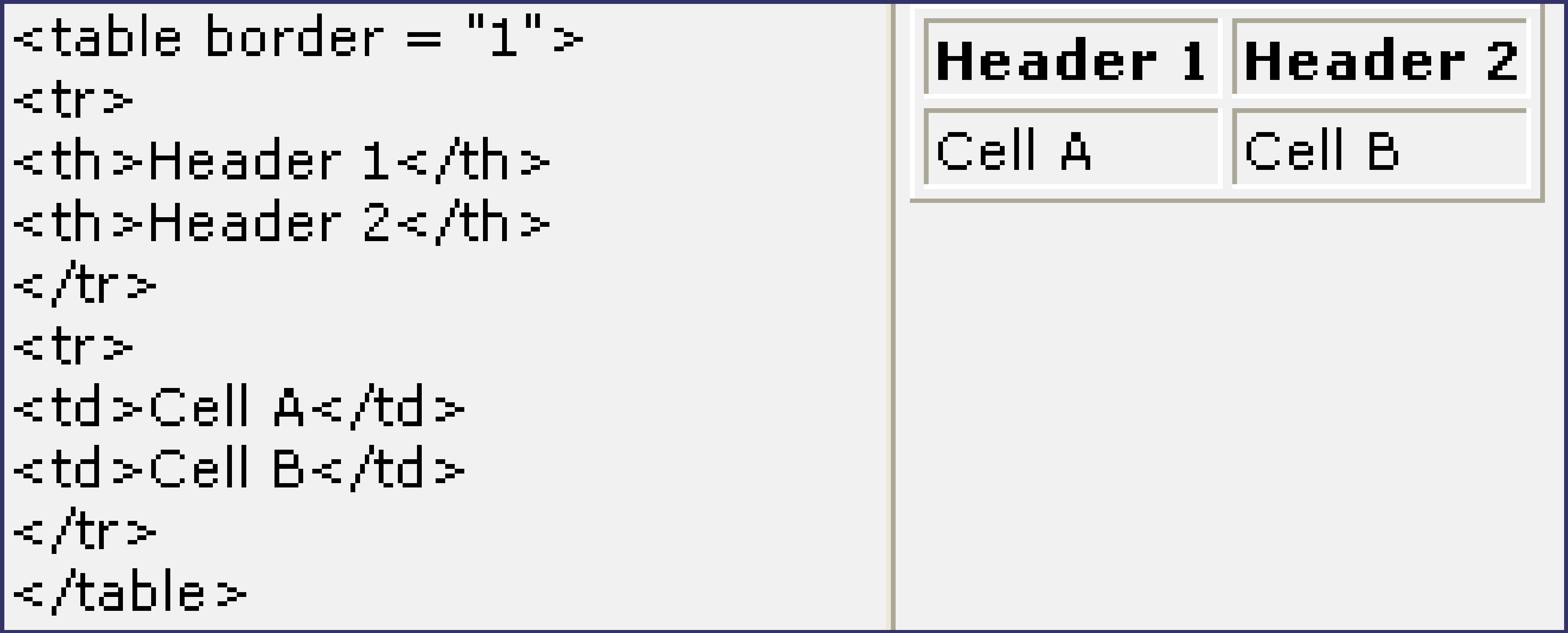


Tables: The <th> tag

- Defines a table header cell in a table. The text within the th element usually renders in bold.
- The align and valign attributes are the same as <tr>, but these will overrule the latter in case of conflict. Other important attributes are:
  - **colspan**: the number of columns this cell should span.
  - **rowspan**: the number of rows this cell should span.

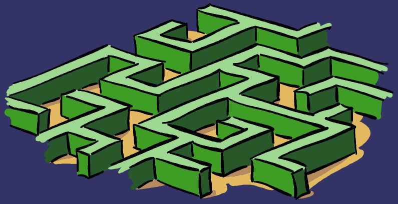


Tables: The <th> tag



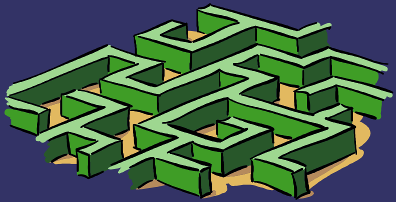
```
<table border = "1">
<tr>
<th>Header 1</th>
<th>Header 2</th>
</tr>
<tr>
<td>Cell A</td>
<td>Cell B</td>
</tr>
</table>
```

Header 1	**Header 2**
Cell A	Cell B



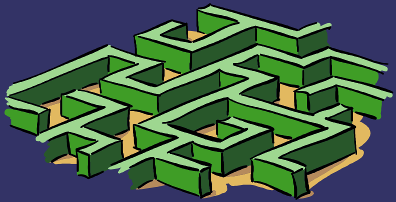
Tables: The <td> tag

- Defines a cell in a table.
- The align and valign attributes are the same as <tr> or <th>.
- Other important attributes are:
  - **colspan**: the number of columns this cell should span.
  - **rowspan**: the number of rows this cell should span.



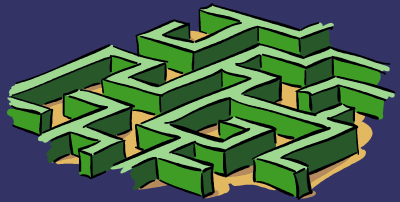
Frames

- Frames are deprecated as of HTML5.
- iframes only are supported.



The <iframe> tag

- The iframe tag creates an inline frame that contains another document. The main attributes are:
- **width**, **height**: width or height of the iframe in pixels.
- **name**: specifies the name of an iframe.
- **src**: the URL of the content of the iframe.
- See more here: www.w3schools.com/tags/tag_iframe.asp

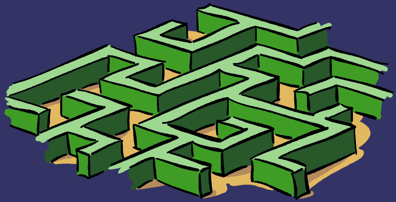


HTML5 - Video

- Example:

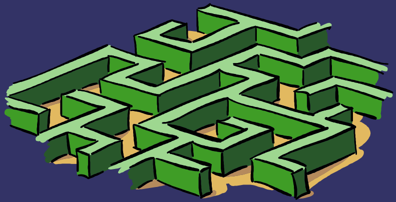
```
<video width="320" height="240" controls="controls">
  <source src="movie.mp4" type="video/mp4" />
  <source src="movie.ogg" type="video/ogg" />
  Your browser does not support the video tag.
  </video>
```

- The control attribute adds video controls, like play, pause, and volume.
- The <video> element allows multiple <source> elements. <source> elements can link to different video files. The browser will use the first recognized format.



HTML5 - Video Tag Attributes

- autoplay="autoplay": Video will start playing as soon as it is ready.
- controls="controls": Video controls will be displayed.
- height, width: Height and width of the video in pixels. Unlike Flash, must be the same as the video content.
- loop="loop": Video will start over again, every time it is finished.
- You should also insert text content between the <video> and </video> tags for browsers that do not support the <video> element.

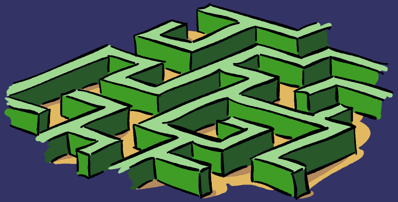


HTML5 - Video

Current browser support and more information:

www.w3schools.com/html/html5_video.asp

You should also insert text content between the <video> and </video> tags for browsers that do not support the <video> element.

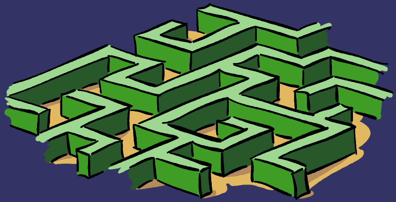


HTML5 - Audio Tag

- HTML5 defines a new element which specifies a standard way to embed an audio file on a web page: the <audio> element. The attributes autoplay, controls, loop, and preload are the same as the video tag.
- Example:

```
<audio controls="controls" autoplay="autoplay">
    <source src="kinderszenen.mp3"
  type="audio/mpeg" />

   Your browser does not support the audio element.
  </audio>
```

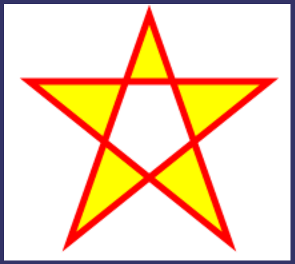
See this page to learn more:
www.w3schools.com/tags/tag_audio.asp

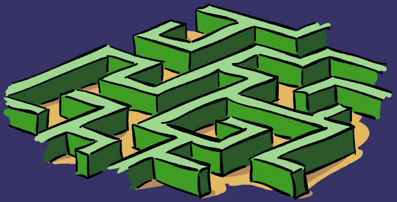


HTML5 - SVG Tag

- In HTML5, you can embed SVG elements directly into your HTML page:
- Example:

```
<svg xmlns="http://www.w3.org/2000/svg"
  version="1.1" height="190">

   <polygon points="100,10 40,180 190,60 10,60
  160,180"

   style="fill:yellow;stroke:red;stroke-
  width:5;fill-rule:evenodd;" />

SVG not supported on your browser.

</svg>
```

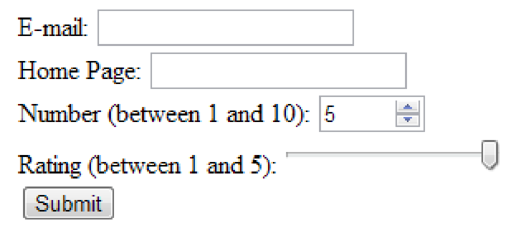




HTML5 - New input types

- HTML5 has several new input types for forms. These new features allow better input control and validation.

```
E-mail: <input type="email" name="usremail"><br>

Home Page: <input type="url" name="homepage"><br>

Number (between 1 and 10): <input type="number"
   name="number" min="1" max="10" step="2"
   value="5"><br>

Rating (between 1 and 5): <input type="range"
   name="rating" min="1" max="5" step="2"
   value="5"><br>
```

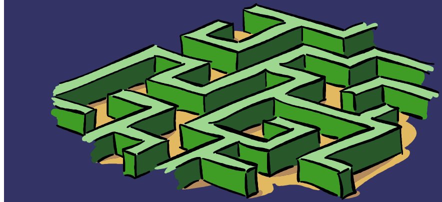


E-mail:

Home Page:

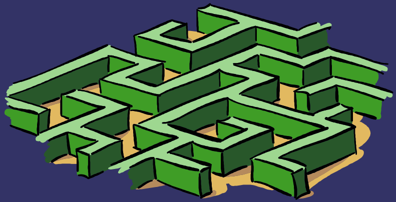
Number (between 1 and 10): 5

Rating (between 1 and 5):



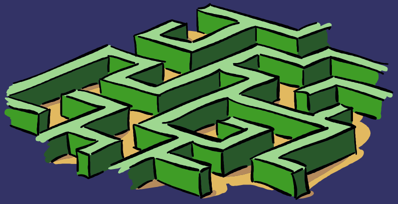
HTML5 - Canvas

- The <canvas> element is used to draw graphics, on the fly, on a web page.
- The HTML5 <canvas> element is used to draw graphics, on the fly, via scripting (usually JavaScript).
- The <canvas> element is only a container for graphics. You must use a script to actually draw the graphics.
- Canvas has several methods for drawing paths, boxes, circles, text, and adding images.
- JavaScript knowledge is required to use the canvas element.



Unix protection codes

- On Unix systems, it is necessary to have the appropriate protection codes on the server.
- Here are some typical settings:
- 777 - Everyone can do everything (Do not use!)
- 711 - CGI script (some servers require 755)
- 666 - Data file
- 644 - Configuration file or other static document (including HTML and PHP)
- 400/600 – Disabled / Invisible



End of lesson