COMP2406 Fall 2016
Carleton University
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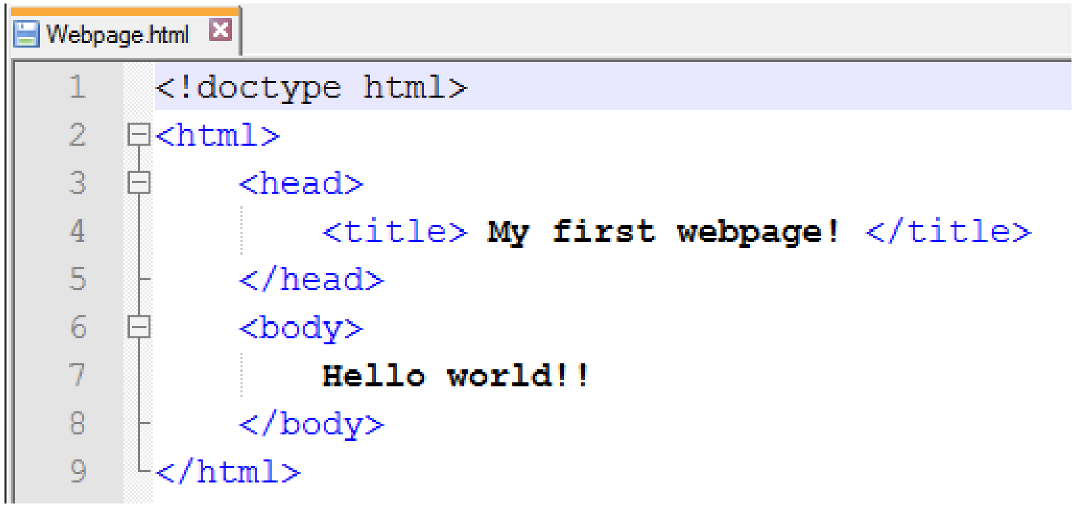
Webpages

Basic HTML Page

- HTML tags typically come in pairs
  - <tagname> … </tagname>
- Nesting tags
  - Proper nesting <tag1>… <tag2>… </tag2> </tag1>



```
<!doctype html>
<html>
    <head>
        <title> My first webpage! </title>
    </head>
    <body>
        Hello world!!
    </body>
</html>
```

Core HTML tags

- <!doctype html>
  - Tell the browser that this file is standard HTML 5
- <html></html>
  - Container for all html tags
- <head></head>
  - Header information (e.g. Title, Script files, etc, etc).
- <title></title>
  - Sets the title of the webpage
- <body></body>
  - Main content of the webpage

HTML Terminology

- Tags
  - <body>, <title>, <font>
- Elements
  - <title>This is a title</title>
- Attributes
  - <p title="I'm a tooltip!">
    - Attribute: name="value"

Text Formatting

- Simple formatting tags
  - <b> **Bold** </b>
  - <i> *Italics* </i>
  - <u> Underline </u>
  - <s> ~~Strikethrough~~ </s>
  - <sup> Super$^{\text{script}}$ </sup>
  - <sub> Sub$_{\text{script}}$ </sub>
  - <big> Big Text </big>
  - <small> Small text </small>
  - <mark> Highlighted </mark>

Text Layout

- Header Tags
  - <h1>Header</h1>
    - <h2>Sub header</h2>
      - <h3>Sub sub header</h3>
        - <h4> … </h4>
          - <h5> … </h5>
            - <h6> … </h6>
- The paragraph tag
  - <p>This is a paragraph of text</p>

Text Layout (2)

- Line break tag
  - <br/>
  - Line breaks (enter key) in the html code are ignored, must use the break tag
  - Note: “Empty element” (not a paired tag)
- Horizontal Rule
  - <hr/>

  - <hr width="50%" />

Pre-format Tag

- HTML will only display one space between words
  - All other whitespace is ignored
- <pre> tag
  - Maintains all of the whitespaces as written in the source code.

  -
    ```
    <pre> This text        contains
                   many spaces       in the
       source.
    </pre>
    ```

HTML entities

- &nbsp;
  - Non-breaking space
- &lt; and &gt;
  - < and >
- &amp;
  - Ampersand (&)
- &copy;
  - ©

Lists

- <ul> Unordered lists
  - <li> List item </li>
  - <li> Another list item</li>

  </ul>

- <ol> Ordered lists
  1. <li> List item </li>
  2. <li> Another list item </li>

  </ol>

List Attributes

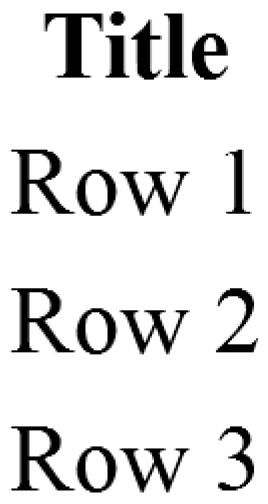
- <ol type="a" start="3">
  c. ‘type’ attribute specifies the type of marker.
  d. Options include: 1, a, A, i, I
  e. ‘start’ attribute specifies the first value of the list
  f. Values must be a number.

Tables

- <table> … </table>
  - Encloses the definition of a table
- <tr> … </tr>
  - Encloses a single row in a table
- <th> … </th>
  - Encloses a single table heading cell
- <td> … </td>
  - Encloses a single table data cell

Simple Table Example

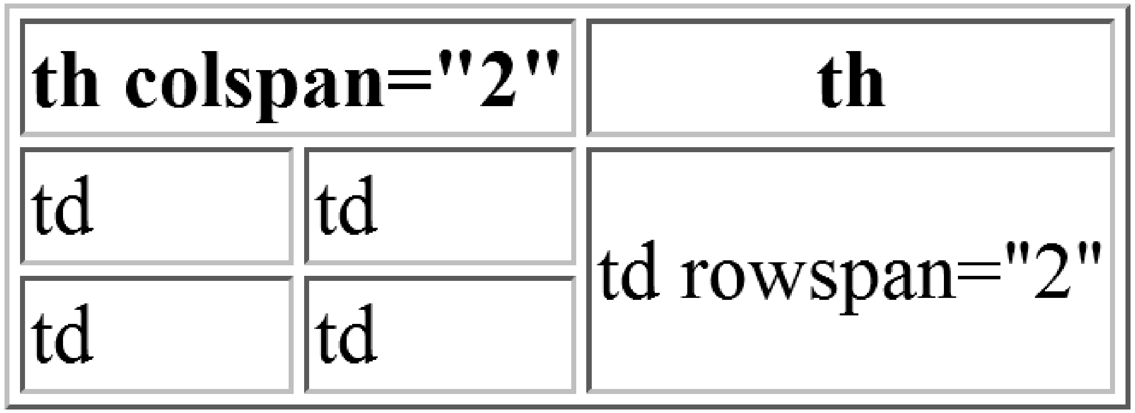
- <table>
  - <tr><th>Title</th></tr>
  - <tr><td>Row 1</td></tr>
  - <tr><td>Row 2</td></tr>
  - <tr><td>Row 3</td></tr>
- </table>



Title
Row 1
Row 2
Row 3

Table Cell Attributes

- colspan
  - Number of columns a cell should span
- rowspan
  - Number of rows a cell should span



th colspan="2"		th
td	td	td rowspan="2"
td	td	

Comment tags

- <!-- Your comment here -->

- Does not affect the webpage at all
  - Used for explaining your html code
  - Good for labelling parts of large files
  - Temporarily removing code without deleting it

Hyperlinks

- <a href="url">Sample link</a>
  - The “anchor” (<a>…</a>) tag creates hyperlinks
  - The href attribute specifies where that link points
  - The element body is what’s shown.
  - E.g.: Sample link
  - URL can be a local file, e.g., “page2.html”
    - Use ../ to go up a level, e.g., “../otherfolder/page3.html”
  - Or a web address, e.g., “http://www.google.ca”

Images!

- <img src="imageFile.ext" />
  - The img tag is an empty tag (no closing tag)
  - src attribute specifies what the image is
- Other attributes
  - title – specifies the mouseover text
  - height/width – in pixels or in %

Invisible Elements

- <div> … </div>
  - Invisible *block-level* element
  - Can be used for grouping areas of a page
- <span> … </span>
  - Invisible *inline* element
  - Can be use for grouping sections of text

Element IDs

- All tags support the **id** attribute
  - Gives a unique name to the element
  - <h1 id = "myHeadline"> … </h1>
  - <p id="introParagraph"> …. </p>
  - No spaces, must contain at least one character

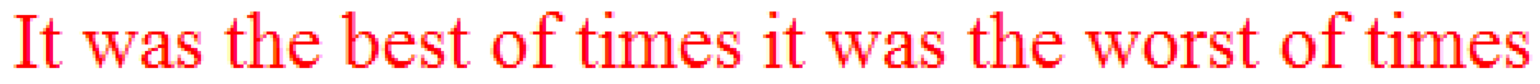
- Can be referred to in hyperlinks
  - <a href="aPage.html#myHeadline"> Wow! </a>
  - <a href="#introParagraph"> Start here </a>

Element Classes

- Global attribute **class**
  - <p class="warning">...</p>
  - Like IDs but not unique
  - Specify multiple elements to be treated the same
  - Used for css styling and javascript selection

Style Attribute

- style="property:value;"
  - Global attribute
  - Specifies the style for a specific element
- E.g.: <p style="color:red"> … </p>

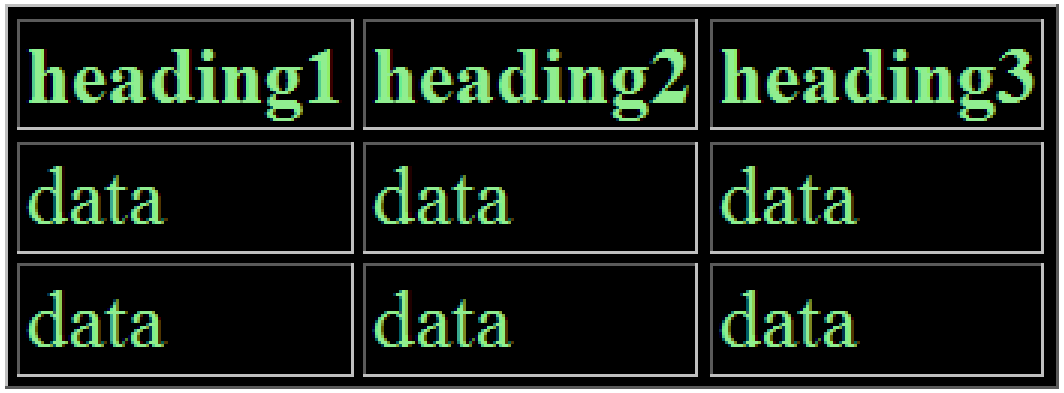

It was the best of times it was the worst of times

Colo(u)r values

- Constants
  - E.g.: Red, Blue, Cyan, Grey, Magenta, ForestGreen, Salmon, LightSalmon, LightGoldenRodYellow,…
- Hexadecimal (0,1,2,3,4,5,6,7,8,9,a,b,c,d,e,f)
  - #RRGGBB
  - E.g.: #ff0000, #00ff00, #0000ff, #008a8a, #A0522D
- rgba(255,255,128,0.6)

Color Styles

- Background-color: colorValue;
  - Changes the background colour of the element
- Color: colorValue;
  - Changes the colour of the text of the element
- <table border="1" style="color:lightgreen; background-color: #000"> ... </table>



heading1	heading2	heading3
data	data	data
data	data	data

Background Image Styles

- Background-image: url('Image.gif');
  - Add a background image to an element
  - Can use the body element to set the whole page
- Background-repeat: repeat;
  - Determine if the background image should tile
  - Other options are repeat-x, repeat-y, no-repeat
- Background-attachment: fixed;
  - Background stays static while text scrolls

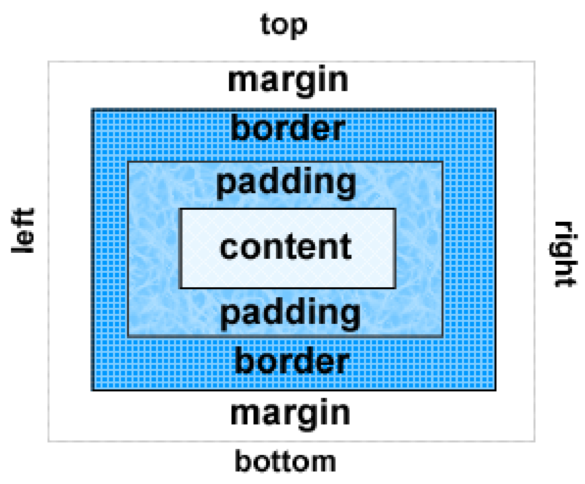
Border Styles

- Border-style: solid;
  - Specifies the type of border
  - Other options: none, dotted, dashed, double
    - Groove, ridge, inset, outset
- Border-width: 5px;
  - Specifies the width of the border in pixels
- Border-color: blue;
  - Specifies the colour of the border.

Margins and Padding

- Margin: top right bottom left;
- Padding: top right bottom left;

  - Where each value is a number (in px, pt, cm, or %)
  - Can also be specified individually
    - Margin-top: 10cm;



Sizing & Placement

- Width: 50%;
- Height: 200px;
  - Sets the size of the content of an element.
  - Before paddings and margins are considered
- Float: left;
  - "floats" a block element in its container
  - inline elements will wrap around it
- clear: both;
  - Element cannot be next to a float

Positioning

- Specify an element outside of the normal flow
  - position:static; -- Normal flow (default)
  - position:relative; -- Relative shift (from normal)
  - position:absolute; -- Shift from top left corner of container element
  - position:fixed; -- relative to browser viewport, does not scroll
- Set shifts, e.g.:

  left: 10px; top:10%;

Text Styling

- Color: #55cc99;
  - Color of the text
- Text-align: left/right/center;
  - Aligns the text within its containing element
- Font-family: 'Times New Roman';
  - Specifies the font to use
    - Can specify a comma separated list of fallbacks
    - Font-family: 'Times New Roman', Times, serif;
- Font-size: 30px;

CSS Files

- HTML is for the content of a webpage.
  - Not intended for style information.

- Create a single CSS file.
  - Instead of repeating style attributes all over
  - Link to it by adding a link tag in the <head> section
  - <link rel="stylesheet" type="text/css" href="myStyle.css" />

CSS Styles

- Styles are defined per tag type. E.g.:

```
body {
   background-color: #222;
}
h1{
    color: red;
}
p{
    background-color: black;
    color: white;
}
```

CSS Selectors

- Selectors determine where to apply the style
- Element selectors
  - Select all elements of a given tag to style.
  - E.g.

```
p{
        text-align: center;
        color: red;
}
```

ID Selectors

- Recall the ID attribute
  - <div id="aboutMe"> … </div>
- Can be selected individually
  - Styles a single element
  - E.g.

```
#aboutMe{
            background-color: blue;
            color: gold;
}
```

Class Selectors

- HTML class attribute
  - Specifies a class label for an element
  - <p class="abstract"> …</p>

- Select all elements of a class
  - E.g.,

```
.abstract{
        font-size: 20px;
        font-style: italic;
}
```

Class Selectors (2)

- Elements can be of multiple classes.
- <h1 class="warning headline"> … </h1>

- .warning{ color: red;
  font-style: bold;
  }
- .headline{ text-align: center;
  font-size: 60px;
  }

Compound selectors

- Can target more specifically by combining selectors.
  - tag.className { styles}
- E.g. Change the warning class when it appears as a link?
  - a.warning { color: #ff0055 }
  - <a class="warning" href="help.html"> Help! </a>

Specificity

- Consider the following scenario:
  - <p id="aboutMe"> … </p>
  - p{ color: white; }
  - #aboutMe{ color: gold; }
- What color will the text be?
- Specificity rules resolve conflicting styles
  - ID > class > element
  - Inline styles > external css files
  - !important > everything

Grouped Selectors

- Multiple selectors with the same styles?
  - h1 { text-align : center; }
  - h2 { text-align : center; }
  - h3 { text-align : center; }

- Group them to save typing (errors/time).
  - h1, h2, h3 { text-align : center; }
  - Separate independent selectors with commas.

Descendant Selectors

- Style only paragraphs within div elements?
  - div p { text-shadow: 2px 2px #553322; }
  - Descendant selectors separated by spaces

- Change the style of the <em> tag in abstracts?
  - .abstract em{ text-decoration: underline; }

Special Selectors: Link Pseudo-classes

- Links can be styled based on their state…
  - Normal unvisited link
    - a:link{ color: green; }
  - Previously visited link
    - a:visited{ color: red; }
  - Currently active (being clicked) link
    - a:active{ color: blue; }

Special Selectors: Hover Pseudo-class

- Style content differently when the mouse is over it!
  - Add the selector :hover
  - For links, :link -- :visited -- :hover -- :active
- Examples:
  - div:hover{ border: solid 2px lightBlue; }
  - a:hover{ text-shadow: 2px 2px green; }

Special Selectors

- Universal selector

```
    *{text-align:center}
```

- Attribute selectors

```
.myClass[myAttr]{font-weight:bold}

.myClass[myAttr="value"]{
    text-decoration:underline;
}
```

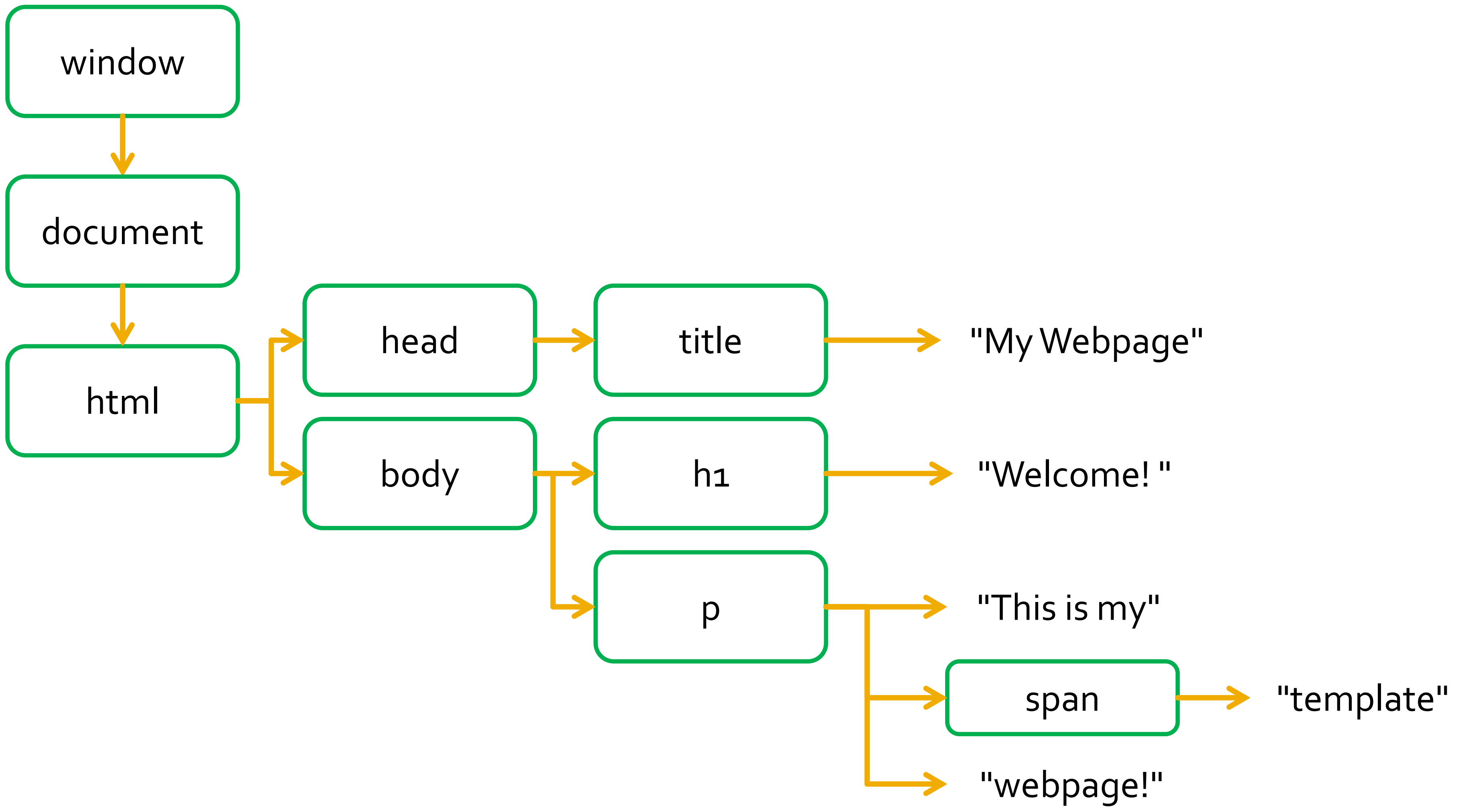
Scripts

- <script > </script>
  - Run javascript in an html browser
  - Either as file or as raw code
- Attributes:
  - type="application/javascript" (default)
  - src="./lib/javascript.js"
  - defer, async

Document Object Model

- Tree-based API structure for HTML documents
  - Elements in HTML become nodes (objects)
  - Attributes and styles become properties
  - Methods for getting and setting content
- Accessible through javascript
  - Empowers dynamic content!
  - Editing HTML and CSS on the client-side
  - React to and trigger events

DOM Structure



Accessing Elements

- document.getElementById("someID")
  - Returns the only matching element
- document.querySelector("cssStyleSelector")
  - Returns the first matching element
- document.querySelectorAll("aSelector")
  - Returns an array-like list of all matching elements

DOM Node Content

- HTML element nodes contain page content
- Useful properties:
  - ele.innerHTML
    - Get/set html string inside the element
    - ele.innerHTML="<p id='greeting'>Hello!</p>";
  - ele.style
    - Get/set style attributes of the element
    - ele.style.color="blue";
  - ele.setAttribute("key","value")
    - Create/change attributes

Creating New Nodes

- Create new elements:
  - var p = document.createElement("p");
  - var text = document.createTextNode("Hello!");
- Add elements into the DOM:
  - var target = document.getElementById("target");
  - p.appendChild(text);
  - target.insertBefore(p, target.firstChild);