Introduction to HTML and CSS

G6921 and G6931
Web Technologies
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Housekeeping

- Course Structure
  - 1) Intro to the Web
  - 2) HTML
  - 3) HTML and CSS – Essay Information Session
  - 4) Intro to Databases
  - 5) Intro to Databases
  - 6) PHP and MySQL
  - 7) Reading Week
  - 8) PHP and MySQL
  - 9) PHP and XML
  - 10) CMS
  - 11) Analytics
  - 12) Visualisation
Housekeeping

• You all have a Laptop?
• Can you all get connected to the Internet?
• Assessment
  – Continuous Assessment
    • Upload the files you create!

Exercise 1

• Write a Bio Paragraph on yourself
• Use HTML text formatting tags
  – e.g. `<p> <h1> <b> <i>`
• Must have:
  – A title
  – A heading
  – A main paragraph
  – Some formatted text
Exercise 2

• Take the page from the previous example
• Alter the page to use semantic tags
  – e.g. <section> <header> <strong> <article>

Exercise 3

• Take the page from the previous example
• Add a new section called “Bibliography”
• In this section place links to related websites
  – Your place of work
  – Your facebook or twitter page
  – The course website
  – Links to hobbies etc.
Exercise 4

• Take the page from the previous example
• Add a new section
• In this section add three lists
  – An unordered list
  – An ordered list
  – A definition list

Exercise 5

• HTML allows the use of graphics
• The <svg> tag allows you to draw shapes as vectors on screen
• Use <svg> to draw a circle
  – Radius 50
  – Colour Blue
  – Position
    • X – 100
    • Y – 100
Exercise 6

• HTML allows you to embed images into a page
• Select an image from the web and save it to the same folder on your laptop as your HTML pages. Also save the URL of the image.
• Use two `<img>` tags
  – One to embed the local image
  – One to embed the remote image

Exercise 7

• HTML allows you to embed videos into a page
• Go to YouTube and pick a video that you like. Make sure that it is “safe for work”!
• See if you can figure out how to embed the video into your page.
Personal Webspace / Sandbox

• Personal Webspace has been set up for each of you on the TCD webserver
• To access this you need a SSH Client
• Windows
• Mac
  – CyberDuck - http://www.cyberduck.ch/
  – FileZilla - http://www.filezilla-project.org/
• Others
  – Filezilla - http://www.filezilla-project.org/

Personal Webspace / Sandbox

• To sign in, you will need to specify:
  – Host Name or Server: dh-sandbox.tchpc.tcd.ie
  – Port: 22
  – Username: Your college username
  – Password: Your network password
  – Protocol: SFTP
Personal Webspace / Sandbox

• Create a folder on your webspace called:
  – www
• Everything you place in this folder will be visible on the web
• Copy your exercise files to the www folder
• Go to this url in your browser:

• ....we need to revisit a couple of slides we skipped in last weeks notes
Character References

- A given character encoding may not be able to express all characters of the document character set.
  - i.e. UTF-8 cannot express all of the UCS
- In such cases, HTML authors can use character references
- Character references in HTML may appear in two forms:
  - Numeric character references
  - Character entity references.

Numeric Character References

- *Numeric character references* specify the code position of a character in the document character set
  - &amp;#D; - where D is a decimal number
  - &amp;#xH; - where H is a hexadecimal number
- Example...
  - &amp;#229; (in decimal) represents the letter "ã"
  - &amp;#xE5; (in hexadecimal) represents the same letter.
Character Entity References

- Character entity references use symbolic names so that authors need not remember code positions.
  - `&aring;` refers to our previous example – “å”
  - Character entity references are case-sensitive.
- HTML does not define a character entity reference for every character in the document character set.
- Are frequently used to represent characters that are markup sensitive in certain context
  - `&amp;` → `&` (ampersand)
  - `&lt;` → `<` (less-than sign)
  - `&gt;` → `>` (greater-than sign)
  - `&quot;` → `"` (quotation mark)
  - `&apos;` → `’` (apostrophe)

So, to summarise...

- HyperText Markup Language or HTML
  - Application of SGML
- A document formatting language with the capability for hypertext links
- Became the primary publishing format for the WWW which supports:
  - Publishing in a platform independent format
  - Creating links to related works from your document
  - The including of graphics and multimedia data with your document
Why is it important?

• Ensures that every user will see all of your content the way you intended
• If you say something on the web, you simply cannot be sure how and when your content will be accessed
  – Browser
  – Language
  – Accessibility Issues

Cascading Style Sheets

• CSS
• Styles define how to display HTML elements
• Styles were added to HTML 4.0
• Style Sheets can save a lot of work
• Style Sheets can enable you to change the appearance and layout of all the pages in a website, by editing one single file
CSS solved a growing problem...

• HTML was never intended to contain tags for formatting a document.
• HTML was intended to define the content of a document, like:
  – `<h1>This is a heading</h1>`
  – `<p>This is a paragraph.</p>`
• Tags like `<font>`, and colour attributes were added in HTML 3.2
• To solve this problem, the W3C created CSS
• In HTML 4.0, all formatting could be removed from the HTML document, and stored in a separate CSS file.
• All browsers support CSS today.

CSS through the years...

<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>CSS</td>
</tr>
<tr>
<td>1998</td>
<td>CSS 2</td>
</tr>
<tr>
<td>Working Draft</td>
<td>CSS 3</td>
</tr>
</tbody>
</table>
CSS Syntax

• How do you write CSS rules...
• A CSS rule has two main parts: a selector, and one or more declarations

• The selector is normally the HTML element you want to style.
• Each declaration consists of a property and a value.

CSS Syntax

• A CSS declaration always ends with a semicolon
• Groups of declarations are always surrounded by curled brackets
• To make the CSS more readable, you can put one declaration on each line, like this:

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

- Like in HTML, comments are used to explain your code, and may help you or others edit the code at a later date.
  - Comments are ignored by browsers.
- A CSS comment begins with "/*", and ends with "*/":
  */This is a comment*/
p {
  text-align:center;
  /*This is another comment*/
  color:black;
  font-family:arial;
}

id and class

- Remember tag attributes in HTML?
  – <p align="right">Example paragraph</p>
- Two attributes are important for CSS
  – id
    • <p id="intro">This paragraph introduces….</p>
  – class
    • <p class="contact">My address is….</p>
id and class

• The id selector is used to specify a style for a single, unique element in a HTML file.
• The id selector uses the id attribute in the HTML file, and is defined in CSS using "#".
• The style rule below will be applied to the element with the attribute id="intro"

```css
#intro {
    text-align: center;
    color: red;
}
```

id and class

• The class selector is used to specify a style for a group of elements in a HTML file.
• This allows you to set a particular style for many HTML elements with the same class attribute.
• The class selector uses the HTML class attribute, and is defined with a "."

```css
.contact {
    text-align: center;
}
```
id and class

• You can also specify that only certain HTML elements should be affected by a class.
• In the example below, all p elements with class="contact" will use a blue font:
  
  ```css
  p.contact {
    color: blue;
  }
  ```

Styling your HTML with CSS

• When a browser reads a style sheet, it will format the document according to it.
• There are three ways of adding a style sheet to your HTML:
  – External style sheet
  – Internal style sheet
  – Inline style
External Style Sheet

• An external style sheet is used when styles are being applied to more than one HTML page.
• With an external style sheet, you can change the look and feel of an entire website by changing this one file.
• Each page must link to the style sheet using the <link> tag. The <link> tag goes inside the <head> section:
  <head>
    <link rel="stylesheet" type="text/css" href="mystyle.css" />
  </head>

External Style Sheet

• An external style sheet can be written in any text editor.
• The file should not contain any html tags.
• The style sheet should be saved with a .css extension.
External Style Sheet

- Example...
  - `hr { color:sienna; }
  `  
  - `p { margin-left:20px; }
  `  
  - `body { background-image:url("images/back.jpg"); }
  `

Internal Style Sheet

- An internal style sheet is sometimes used when a single HTML document is being styled.
- Internal styles are defined in the head section of the HTML page by using the `<style>` tag:

  ```html
  <head>
    <style type="text/css">
      hr { color:sienna; }
      p { margin-left:20px; }
      body { background-image:url("images/back.jpg"); }
    </style>
  </head>
  ```
Inline Styles

- Inline styles lose many of the advantages of style sheets by mixing content & presentation.
  - This method should be used sparingly (if at all)!
- The style attribute in the relevant tag is used to add an inline style.
- The style attribute can contain any CSS property:
  <p style="color:sienna;margin-left:20px">This is a paragraph.</p>

Multiple Style Sheets

- A single HTML file can have multiple associated style sheets...
- Imagine a HTML file which has:
  - an external style sheet linked in the <head>
  - an internal style sheet placed in the <head>
  - Inline styles in certain HTML
Multiple Style Sheets

• The external style sheet contains:
  
  h3 {
    color: red;
    text-align: left;
    font-size: 8pt;
  }

• The internal style sheet contains:
  
  h3 {
    text-align: right;
    font-size: 20pt;
  }

• The inline style contains
  
  <h3 style="color:blue;text-align:right;font-size:20pt">

Multiple Style Sheets

• Multiple Styles Will Cascade into One
• Hence... Cascading Style Sheets – CSS
• Cascading order
  – What style will be used when there is more than one style specified for a HTML element?
• Order of Priority:
  – Inline style (inside an HTML element)
  – Internal style sheet (in the <head> section)
  – External style sheet
  – Browser default
CSS Box Model

• All HTML elements can be considered as boxes
• Think of a box that wraps around HTML elements, which consists of:
  – Margins
  – Borders
  – Padding
  – Actual Content
• The box model allows us to place a border around elements and space elements in relation to other elements.

CSS Box Model

• Margin - Clears an area around the border. The margin does not have a background colour, it is completely transparent
• Border - A border that goes around the padding and content. The border is affected by the background colour of the box
• Padding - Clears an area around the content within the border. The padding is affected by the background colour of the box
• Content - The content of the box, where text and images appear
Width and Height

- width and height relate to the content area only.
- To know the full size of the element, you must also add the padding, border and margin:
  - \texttt{width:250px; padding:10px; border:5px solid gray; margin:10px;}
- The total width of an element should always be calculated like this:
  - Total element width = width + left padding + right padding + left border + right border + left margin + right margin
- The total height of an element should always be calculated like this:
  - Total element height = height + top padding + bottom padding + top border + bottom border + top margin + bottom margin

Backgrounds

- Useful Properties
  - \texttt{background-color}
    - \texttt{background-color:#b0c4de;}
  - \texttt{background-image}
    - \texttt{background-image:url('paper.gif');}
  - \texttt{background-repeat}
    - \texttt{background-repeat:repeat-x;}
  - \texttt{background-position}
    - \texttt{background-position:right top;}
  - \texttt{background}
    - \texttt{body {background:#ffffff url('tree.png') no-repeat right top;}}
Formatting Text

- Useful Properties
  - Color
    - color:blue;
  - text-align
    - text-align:justify;
  - text-decoration
    - text-decoration:line-through;
  - text-transform
    - text-transform:uppercase;
  - text-indent
    - text-indent:50px;

Fonts

- Useful Properties
  - font-family
    - font-family: "Times New Roman", Times, serif;
  - font-style
    - font-style: italic;
  - font-size
    - font-size: 40px;
    - font-size: 2.5em;
Links

- Links can be styled with any CSS property (e.g. color, font-family, background, etc.).
- However, they can also be styled depending on what state they are in:
  - a:link - a normal, unvisited link
    - a:link {color:#FF0000;}
  - a:visited - a link the user has visited
    - a:visited {color:#00FF00;}
  - a:hover - a link when the user mouses over it
    - a:hover {color:#FF00FF;}
  - a:active - a link the moment it is clicked
    - a:active {color:#0000FF;}

Lists

- Useful Properties
  - list-style-type
    - list-style-type: square;
    - list-style-type: lower-alpha;
  - list-style-image
    - list-style-image: url('purple.gif');
Grouping Selectors

• Rather than have:
  
  h1 {
    color: green;
  }
  h2 {
    color: green;
  }
  p {
    color: green;
  }

• You can group the selectors together:
  
  h1, h2, p {
    color: green;
  }

Nesting Selectors

• It is possible to apply a style to a selector within a selector – or nest selectors:
  
  p {
    color: blue;
    text-align: center;
  }
  .marked {
    background-color: red;
  }
  .marked p {
    color: white;
  }
Example

• Suppose the following is the desired result:

Introduction
This article is a review of the book *Dietary Preferences of Penguins*, by Alice Jones and Bill Smith. Jones and Smith’s controversial work makes three hard-to-swallow claims about penguins:

- First, that penguins actually prefer tropical foods such as bananas and pineapple to their traditional diet of fish
- Second, that tropical foods give penguins an odour that makes them unattractive to their traditional predators

Example

```html
<section id="intro">
<header><h1>Introduction</h1></header>
<p>This article is a review of the book *Dietary Preferences of Penguins*, by Alice Jones and Bill Smith. Jones and Smith’s controversial work makes three hard-to-swallow claims about penguins:</p>
<ul>
<li>First, that penguins actually prefer tropical foods such as bananas and pineapple to their traditional diet of fish</li>
<li>Second, that tropical foods give penguins an odour that makes them unattractive to their traditional predators</li>
</ul>
</section>
```
Example

body {
  background-color:rgb(64,131,204);
}

h1 {
  color:white;
  font-size:28px;
  font-weight:bold;
}

p {
  color:red;
}

ul {
  color:yellow;
  list-style:square;
}