



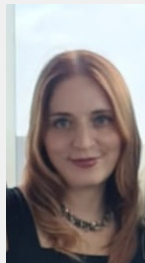
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COM1008 Web and Internet Technologies

Lecture 2: HTML



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Learning Objectives

- During this lesson you will learn about
 - Structure of a web page
 - HTML Basics
 - What is HTML
 - How an HTML Document is structured
 - The <head> section
 - The <body> section
 - Main tags
 - Website organisation



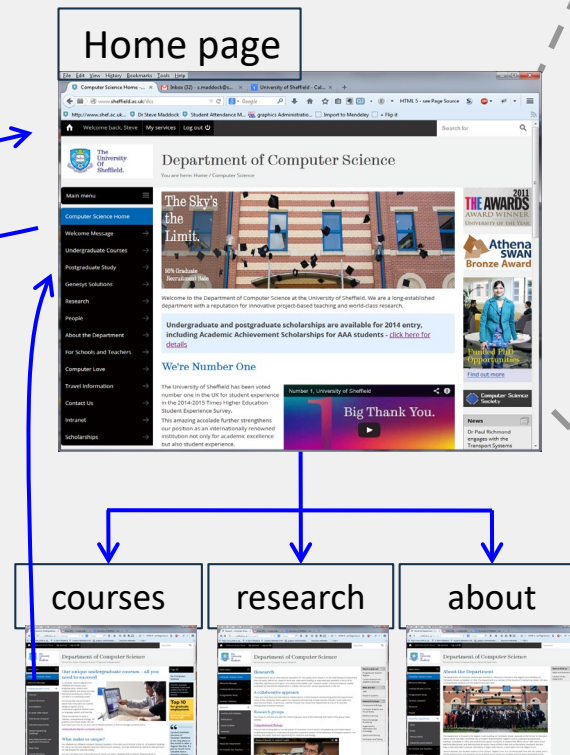
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STRUCTURE OF A WEB PAGE



Structure of a web page

- Each web page is a collection of areas
- a nested structure
- Part of a larger website



Elements of a web page

- A Web page is a set of *elements*
 - Examples: **heading**, paragraph, **image**, **hyperlink**, **figure**, ...
- The Web browser uses a layout engine to arrange the elements on the page

Layout engine	Web browser
Blink	Google Chrome, Microsoft Edge, Opera
Gecko	Mozilla Firefox
Trident	Internet Explorer
WebKit	Apple Safari



Boxes

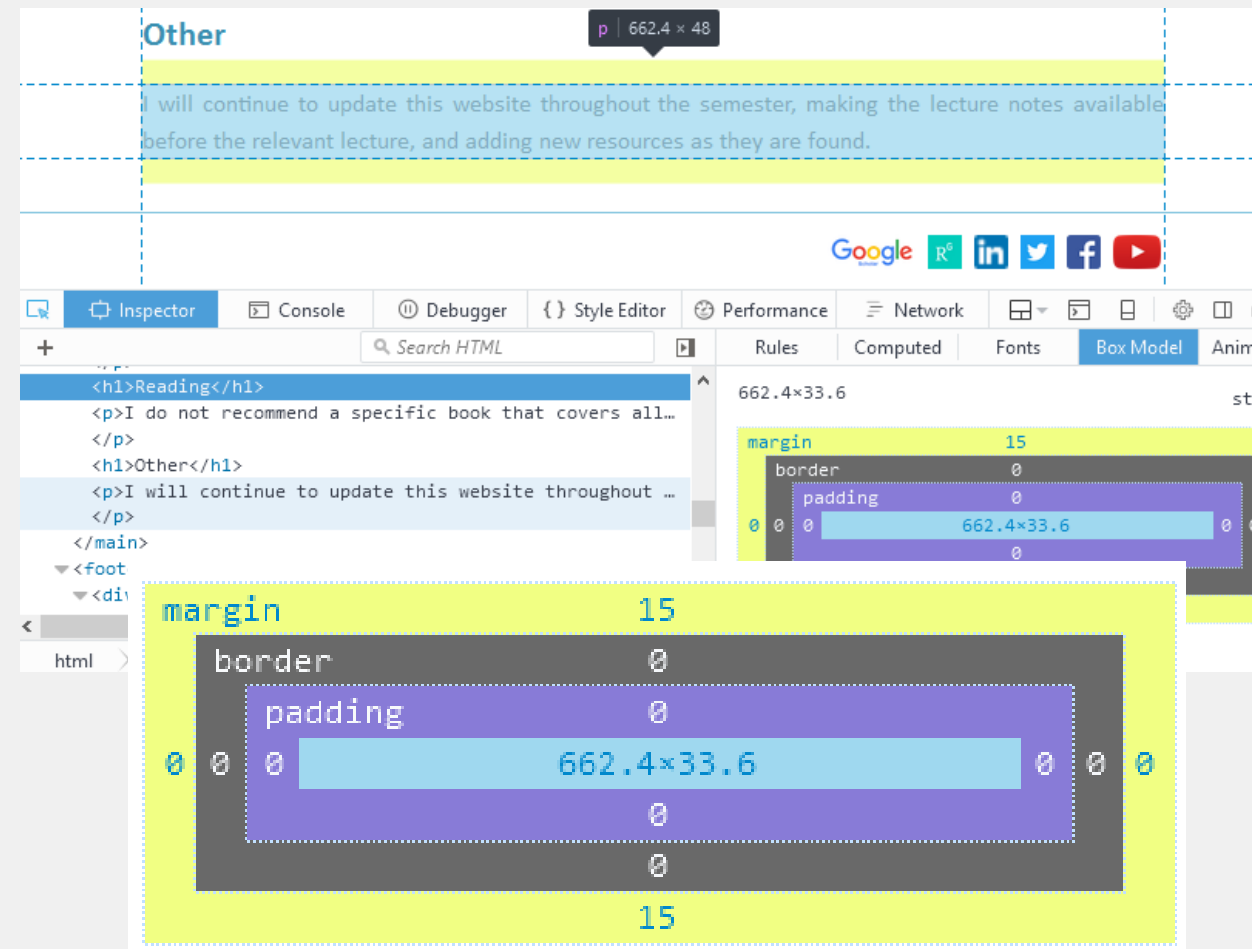
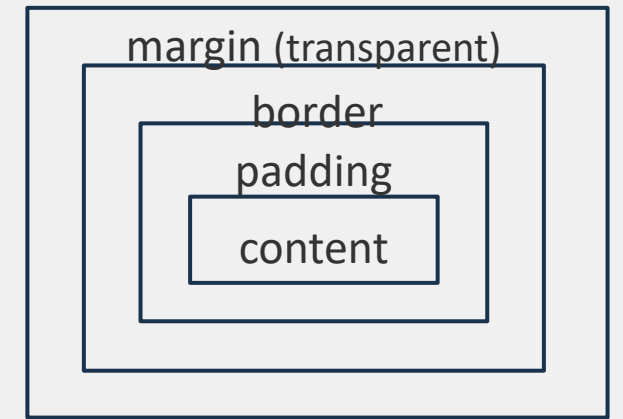
- Every element is a box
- Some boxes are inline
 - E.g. hyperlink, image, button
- Some boxes are blocks
 - Begin on new lines
 - E.g. heading, paragraph, table, canvas, section, footer
- Boxes can be nested
- Essentially, Web page design is about arranging boxes!!





What is a box?

- The HTML box model defines a set of areas, each with changeable properties
- We can inspect these
 - E.g. using browser Developer tools



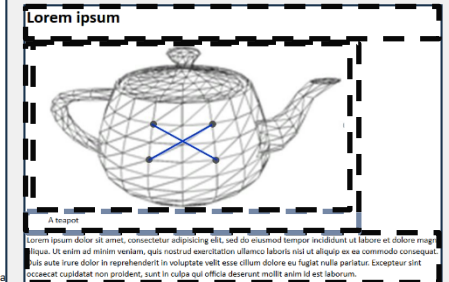
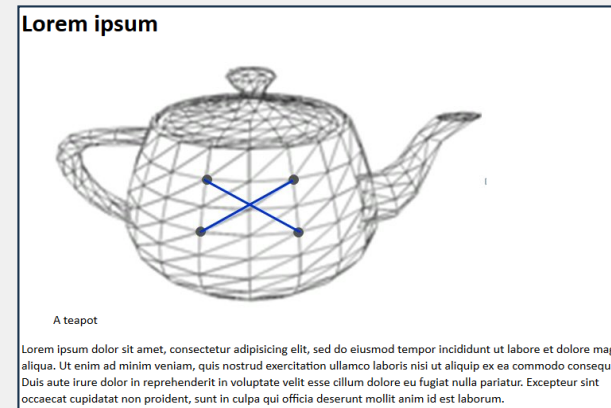
Structure and appearance

- Structure is indicated using
**HyperText Markup
Language**

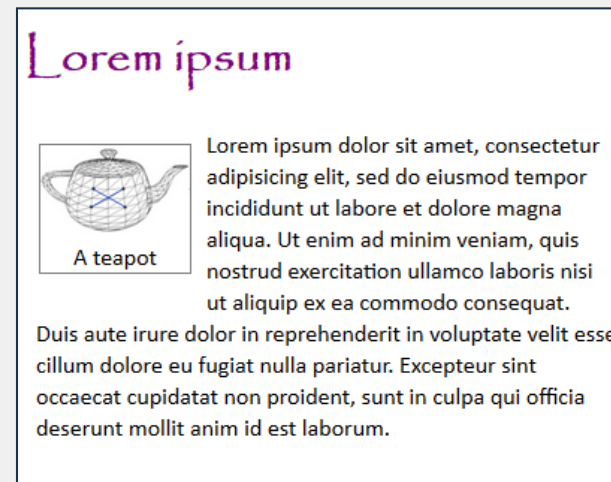
- Appearance is controlled
using a **Cascading Style
Sheet(s)**

- Default

- User-defined



Elements as boxes





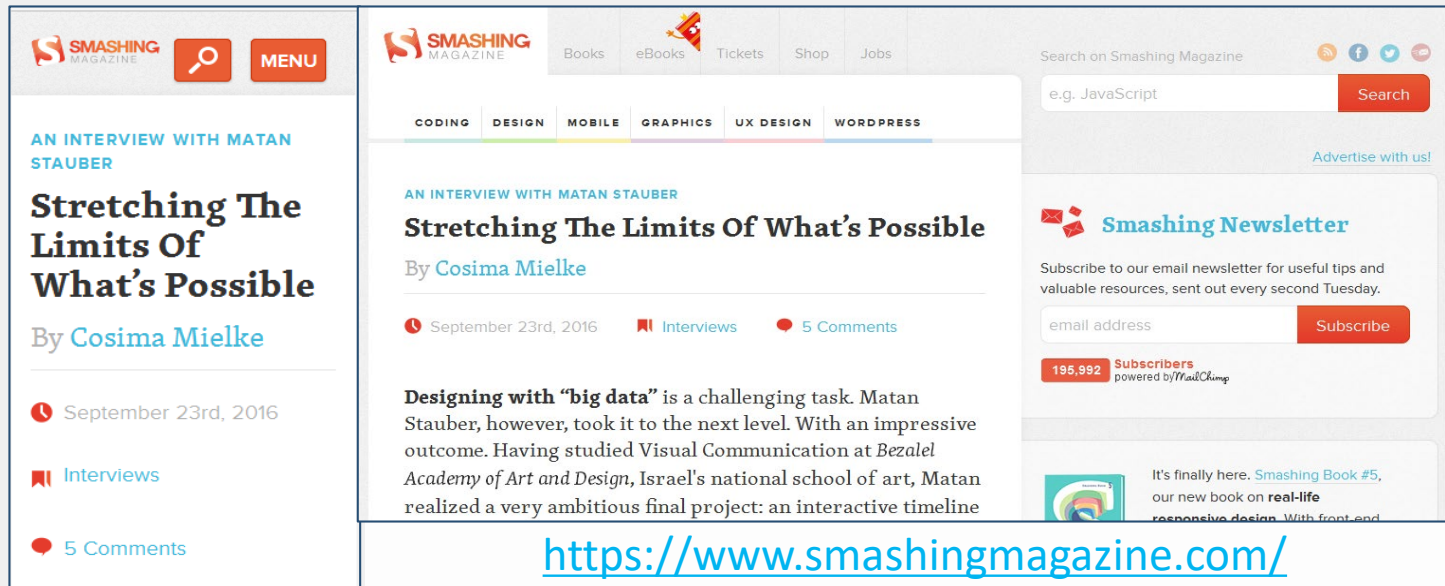
Structure, appearance and behaviour

- Behaviour using JavaScript (and CSS)
- JavaScript can be used to:
 - Interact with the user
 - Control the web browser
 - Alter the document content
 - Examples: Gmail, Twitter, Firefox
- Different versions of browsers (e.g. older browsers) have differing support. Solutions:
 - Browser-specific scripts
 - Use a library or toolkit (e.g. jQuery)
 - Development: Progressive enhancement and degrade gracefully



Anatomy for different ~~devices~~ resolutions

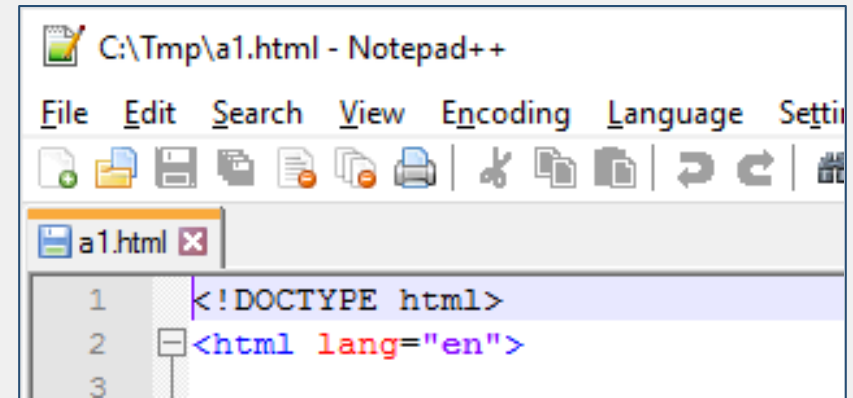
- Responsive Web Design
- Mobile-first responsive web design





How do we implement a web site?

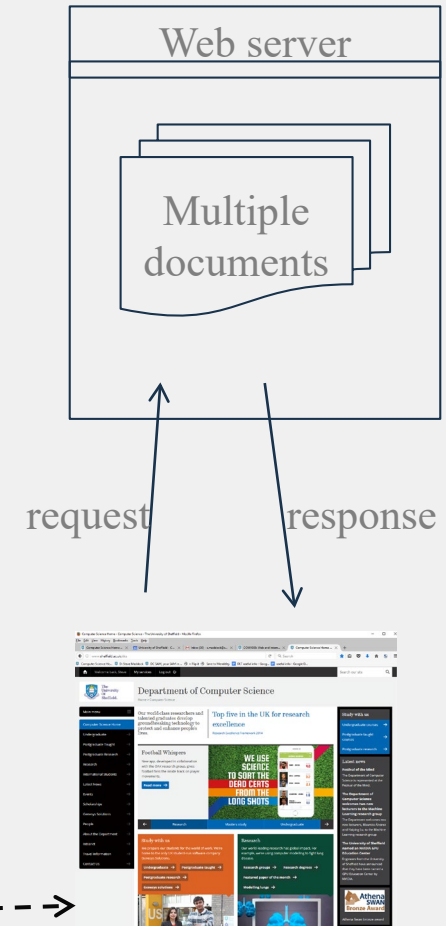
- Hand coding
 - [HTML](#), [CSS](#), [JavaScript](#), [PHP](#), [MySQL](#), ...
- Website creation software
 - Template-based and imaging tools
 - Examples: Dreamweaver, Google sites
- Content management system
 - Manage content, support collaboration and give access control
 - Database-driven process
 - WordPress, Drupal, Joomla!
- Web application framework
 - Development of dynamic websites, applications and Web services
 - Ruby on Rails (RoR), Drupal, Joomla!















Working locally

- Earlier slide showed the idea of a web server and client browser
 - Browser (client) makes a request for a 'document' (a html file stored on the server)
 - Server responds with relevant document
 - Browser displays the html document
- We can also use load a local file by dragging the file into the browser window – no need for a server



Name	^	Date Modified	Size	Kind
 hello.html		22 September 2021 at 21:16	328 bytes	HTML text
 hello2.css		14 October 2020 at 17:13	133 bytes	Text Document
 hello2.html		22 September 2021 at 21:17	346 bytes	HTML text
 hello2extra.css		14 October 2020 at 17:15	317 bytes	Text Document
 tpot1.jpg		5 October 2019 at 23:57	24 KB	JPEG image



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HTML



What is HTML?

- HTML is a markup language for describing web documents (web pages).
 - HTML stands for Hyper Text Markup Language
 - A markup language is a set of markup tags

A small HTML document:

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```




Where is HTML used?

- HTML is used to build most of the web pages you see on the web
- And also some mobile apps!
- HTML is also the language used by most Content Management Systems to build online websites
 - e.g. Wordpress



How does HTML work?

- HTML is read by an interpreter in a browser
 - e.g. Chrome, Safari etc
- The code is read line by line
 - Instructions for the interpreter
- HTML tells the interpreter how to show the content that is inside the HTML tags in the browser



How does an HTML document look?

```
<html>

  <head>

    <title>Page title</title>

  </head>

  <body>

    <h1>This is a heading</h1>

    <p>This is a paragraph.</p>

    <p>This is another paragraph.</p>

  </body>

</html>
```

http://www.w3schools.com/html/html_intro.asp



HTML Tags

- HTML tags are keywords (tag names) surrounded by angle brackets:
 - `<tagname>` `content` `</tagname>`
_____ _____
start tag mix of text and
 elements
 matching end tag
- Some elements might be empty (e.g. ``)



HTML Attributes

- Attributes are named properties of elements
- Attributes are assigned values in elements' start tags, using an = sign

```
<li><a href="http://www.thesimpsons.com/">Bart</a></li>
```

element

attribute

value



A sample document

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

<head>
  <meta charset="utf-8" />
  <title>Team X</title>
</head>
<body>
  <h1>Team X</h1>
  <p>We are Team X.</p>
  <ul>
    <li>Art</li>
    <li><a href="http://www.thesimpsons.com/">Bart</a></li>
    <li>Cara</li>
  </ul>
</body>

</html>
```

Team X

We are TeamX.

- Art
- [Bart](http://www.thesimpsons.com/)
- Cara



A sample document

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

<head>
  <meta charset="utf-8" />
  <title>Team X</title>
</head>

<body>
  <h1>Team X</h1>
  <p>We are Team X.</p>
  <ul>
    <li>Art</li>
    <li><a href="http://www.thesimpsons.com/">Bart</a></li>
    <li>Cara</li>
  </ul>
</body>

</html>
```

Team X

We are Team X.

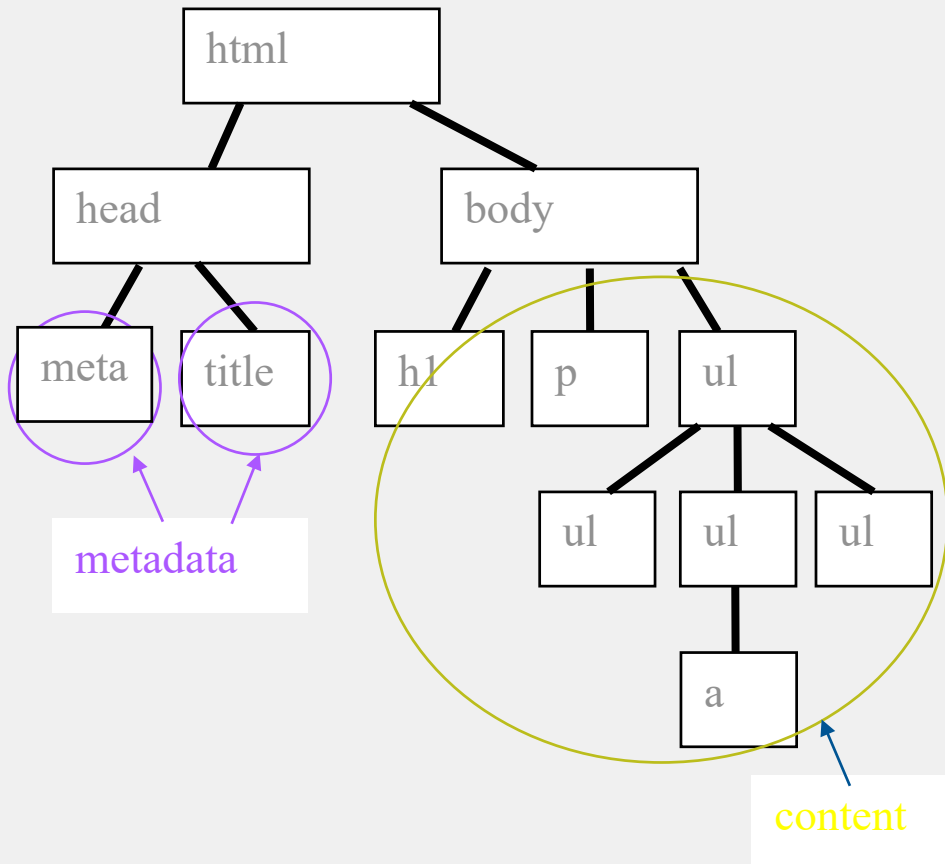
- Art
- [Bart](http://www.thesimpsons.com/)
- Cara



HTML markup - a closer look

- The DOCTYPE declaration defines the document type to be HTML
- The text between <html> and </html> describes an HTML document
- The text between <head> and </head> provides information about the document
 - metadata and declaration of files (e.g. style and javascript files)
- The text between <title> and </title> provides a title for the document
 - the title is what you see in the window's bar
- The text between <body> and </body> describes the visible page content
 - The text between <h1> and </h1> describes a heading
 - The text between <p> and </p> describes a paragraph
- Using this description, a web browser can display a document with a heading and a paragraph.
- HTML describes the structure of a document.

A sample document



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

<head>
  <meta charset="utf-8" />
  <title>Team X</title>
</head>

<body>
  <h1>Team X</h1>
  <p>We are Team X.</p>
  <ul>
    <li>Art</li>
    <li><a
href="http://www.thesimpsons.com/">Bart</a></li>
    <li>Cara</li>
  </ul>
</body>

</html>
```



Doctype and language

- Specifying the doctype triggers browsers that need it to operate in html standards mode

`<!DOCTYPE html>`

- The root level of the document is the **html element**
 - The html element has a language attribute

en = English - `<html lang="en">`



Document Head

- The content of the head element is not rendered in the browser window
- The title element is compulsory and is displayed in the title bar
- The meta element provides a general-purpose mechanism for adding metadata to HTML documents

```
<meta charset="utf-8" />
```



Charset

- Charset is an attribute of a meta tag to define the document's character encoding
 - Security risk of not setting it
- Must be in first 512 bytes
- Multibyte character encoding for Unicode.

```
<meta charset="utf-8" />
```




Other metadata

- Other metadata elements use name and content attributes

```
<head>
  <meta charset="utf-8" />
  <title>Team X</title>
  <link rel="stylesheet" href="teamx1.css" />
  <meta name="author" content="Steve Maddock" />
  <meta name="description" content="Team X web site for COM3517" />
  <meta name="keywords" content="Team X, sports" />
</head>
```



Other elements in <head>

- Other elements
 - link – stylesheets (see later)
 - script – JavaScript (see a later lecture)

```
<head>
  <meta charset="utf-8" />
  <title>Team X</title>
  <link rel="stylesheet" href="teamx1.css" />
  <meta name="author" content="Steve Maddock" />
  <meta name="description" content="Team X web site for COM3517" />
  <meta name="keywords" content="Team X, sports" />
</head>
```



The body of an HTML document

- The document body contains all the main content of the document
 - What will be displayed on screen
 - It is contained inside the `<html>` tag
 - At the same level as `<head>`



The body of an HTML document - example

```
<body>
  <h1>Team X</h1>
  <p>We are Team X.</p>
  <ul>
    <li>Art</li>
    <li><a href="http://www.thesimpsons.com/">Bart</a></li>
    <li>Cara</li>
  </ul>
</body>
```



Headings

- HTML defines six level of headings in descending order of importance
 - `h1`, `h2`, `h3`, `h4`, `h5`, `h6`
- The heading element includes predefined formatting
 - Font change
 - Paragraph break
 - Space before and after



Headings – H1 example

Team X

A team from the University of Sheffield

We are Team X.

- Art
- [Bart](#)
- Cara

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8" />
  <title>Team X</title>
</head>
<body>
  <h1>Team X</h1>
  <h2>A team from the University of
  Sheffield</h2>
  <p>We are Team X.</p>
  <ul>
    <li>Art</li>
    <li><a
href="http://www.thesimpsons.com/">Bart
</a></li>
    <li>Cara</li>
  </ul>
</body>
</html>
```




Other textual elements

- Paragraph `<p>`
- Line break `
`



Lists

- HTML defines three types of lists
 - **unordered list **— group of related items in no particular order
 - **ordered list ** — group of related items in a particular order
 - **Description list <dl>** — group of name/value pairs



Lists - examples

```
<ul>
  <li>Art</li>
  <li><a href="http://www.thesimpsons.com/">Bart</a></li>
  <li>Cara</li>
</ul>
```

- Art
- [Bart](#)
- Cara

```
<ol>
  <li>Wake up</li>
  <li>Drink Coffee</li>
  <li>Go to work</li>
</ol>
```

1. Wake up
2. Drink Coffee
3. Go to work

```
<dl>
  <dt>Coffee</dt>
  <dd>brewed drink prepared from roasted coffee beans</dd>
  <dt>Sugar</dt>
  <dd>generic name for sweet-tasting, soluble carbohydrates</dd>
</dl>
```

Coffee
brewed drink prepared from roasted coffee beans

Sugar
generic name for sweet-tasting, soluble carbohydrates



Hyperlinks

- Hyperlinks link a source and a destination

```
<a href="URL">link text</a>
```

- Default display: blue and underlined
- Once visited: purple and underlined



Hyperlinks example

```
<body>
  <h1>Team X</h1>
  <p>We are Team X.</p>
  <ul>
    <li>Art</li>
    <li><a href="http://www.thesimpsons.com/">Bart</a></li>
    <li>Cara</li>
  </ul>
</body>
```

Team X

We are Team X.

- Art
- [Bart](#)
- Cara

Team X

We are Team X.

- Art
- [Bart](#)
- Cara



Anchors

- Anchors (or bookmarks) allow readers to jump to specific parts of a Web page
 1. Create an anchor:
`<h1 id="Top">Team X</h1>`
 2. Link to the anchor:
`Go to the top`
 3. When the user clicks the link, the page will scroll to the location
- You can create a link to an anchor in an external page

```
<a href="../feedback.html#Comments">Send a comment</a>
```



Block and inline elements

- How does the browser know when to start a new line?

```
<body>
  <h1>Team X</h1>
  <p>We are Team X.</p>
  <p>We welcome new members.</p>
  <ul>
    <li>Art</li>
    <li><a
href="http://www.thesimpsons.com
/">Bart</a> - Club Captain</li>
    <li>Cara</li>
  </ul>
  <p>Designed by <em>a web
designer</em>, 2011</p>
</body>
```

Team X

We are Team X.

We welcome new members.

- Art
- Bart - Club Captain
- Cara

Designed by *a web designer*, 2011



Block elements

- Begin on new lines
- Can contain other block and inline elements
- Examples: p, div, ul, li, table, h1, h2, h3, h4, h5, h6



Inline elements

- Do NOT begin on new lines
- Can contain other inline elements or data
- Examples: a, img, span, em, strong, code, b, i, big, small, cite



Images


- To insert an image, use
``
- The `` tag has two required attributes:
 - src: the image file
 - alt: the text to present if the image is not available or for accessibility reasons




Images attributes

- The tag supports several attributes for formatting images
 - Not all of them might work perfectly
 - Especially alignment
 - Height and width can be used but they do not scale the image, just set a size so they might distort it

Attributes

 = New in HTML5.

Attribute	Value	Description
<u>align</u>	top bottom middle left right	Not supported in HTML5. Specifies the alignment of an image according to surrounding elements
<u>alt</u>	<i>text</i>	Specifies an alternate text for an image
<u>border</u>	<i>pixels</i>	Not supported in HTML5. Specifies the width of the border around an image
<u>crossorigin</u>	 anonymous use-credentials	Allow images from third-party sites that allow cross-origin access to be used with canvas
<u>height</u>	<i>pixels</i>	Specifies the height of an image
<u>hspace</u>	<i>pixels</i>	Not supported in HTML5. Specifies the whitespace on left and right side of an image
<u>ismap</u>	ismap	Specifies an image as a server-side image-map
<u>longdesc</u>	<i>URL</i>	Specifies a URL to a detailed description of an image
<u>src</u>	<i>URL</i>	Specifies the URL of an image
<u>usemap</u>	<i>#mapname</i>	Specifies an image as a client-side image-map
<u>vspace</u>	<i>pixels</i>	Not supported in HTML5. Specifies the whitespace on top and bottom of an image
<u>width</u>	<i>pixels</i>	Specifies the width of an image

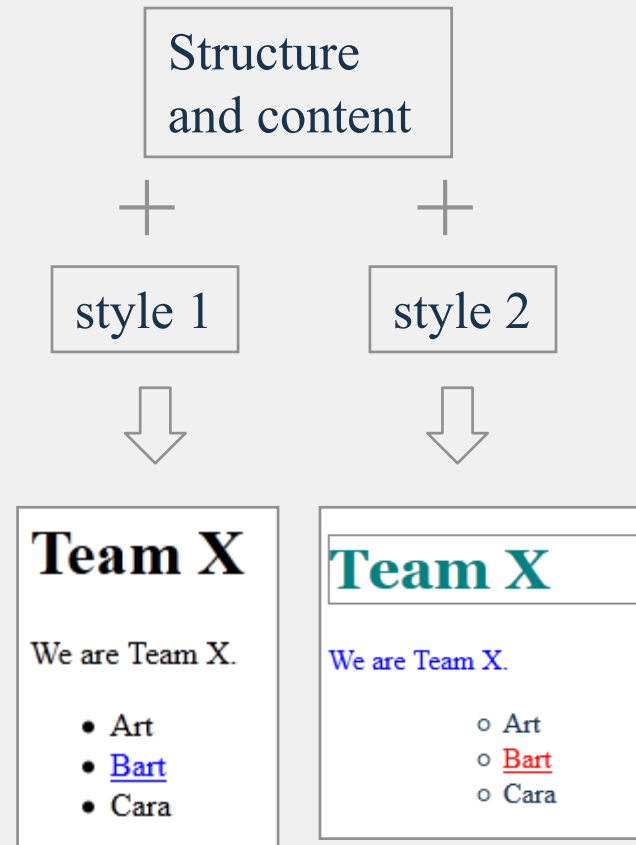


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HOW DO WE STYLE A WEB PAGE?



Structure and content + style





Styling in older HTML

- In the past the style of each element was declared within the element itself
 - e.g. you could declare:
`<center>This text will be center-aligned.</center>`
 - many of them were tags in themselves
 - However this was not good
 - you may want to have different elements formatted in the same way
 - multiple declarations bring to errors

NO LONGER SUPPORTED!!!



Styling using CSS

- CSS defines the standard styling (e.g. formatting) for the **types of elements** based on:
 - their type (e.g. `<h1>`)
 - their identity (e.g. `<h1 id="myId">`)
 - their position in the document(`ul li div` - a div contained in a list)



12. A

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

<head>
  <meta charset="utf-8">
  <title>Hello World</title>
</head>

<body>
  <h1>Hello, World!</h1>
  <p>Illustrating a basic HTML page.</p>

  <p>Why "Hello, World! "? - see <a
href="https://en.wikipedia.org/wiki/Hello_World_(disambiguation)">Wikipedia</a>.</p>

</body>
</html>
```

Hello, World!

Illustrating a basic HTML page.

Why "Hello, World! "? - see [Wikipedia](https://en.wikipedia.org/wiki/Hello_World_(disambiguation)).

Link: [html file](#)



Example 1

Hello, World! again

Illustrating a basic HTML page.

Why "Hello, World!"? - see [Wikipedia](#).

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

<head>
  <meta charset="utf-8">
  <title>Hello World 2</title>
  <link rel="stylesheet" href="hello2.css">
</head>
<body>
  <h1>Hello, World!</h1>
  <p>Illustrating a basic HTML page</p>
  <p>...</p>
</body>
</html>
```

```
h1 {
  color: teal;
  font-family: Georgia, serif;
  font-size: 2em;
}

p {
  color: rgb(77, 5, 124);
}
```

Link: [html file](#), [css file](#)



Example 2

Hello, World! again

Illustrating a basic HTML page.

Why "Hello, World!?" - see [Wikipedia](#).

```
body {  
    background-color: rgb(214, 233, 238);  
}  
h1 {  
    color: teal;  
    font-family: Georgia, serif;  
    font-size: 2em;  
    background-color: rgb(212, 175, 184);  
}  
p {  
    color: rgb(77, 5, 124);  
    background-color: rgb(142, 200, 140);  
}  
a {  
    background-color: rgb(245, 203, 19);  
}
```



In Summary

- Today we have looked at:
 - The structure of a web page
 - How to create an HTML page

Main HTML tags

- Next week we will look at
 - CSS
 - More HTML



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APPENDIX



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PATHS AND WEBSITES/WEBAPPS ORGANISATION



Website/Webapp organisation

- Pages and resources in a website are organised in folders
- They can refer to each other (e.g. in a link) via either:
 - an absolute path
<https://mydomain.org/js/jav.js> (not suggested unless external)
 - a relative path
 - that allows navigating the filesystem:
 - Similar to Uni/Linux filesystem
 - Useful because can easily move whole Web site to a different host machine, as the links are relative



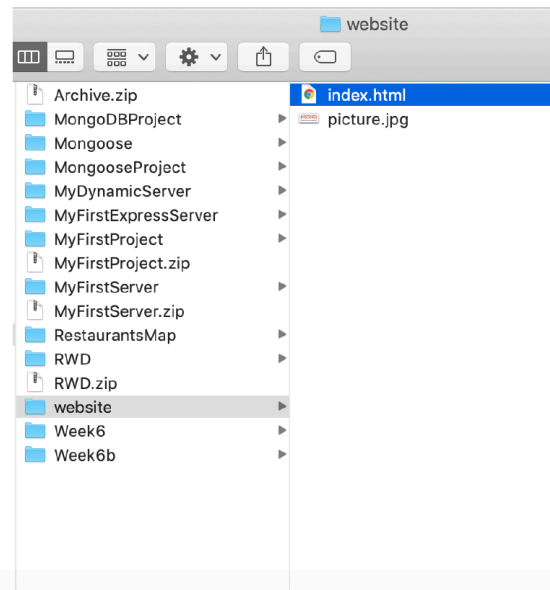
Paths - file in same folder

- In Index.html

```

```

picture.jpg is located in the same folder as the current page

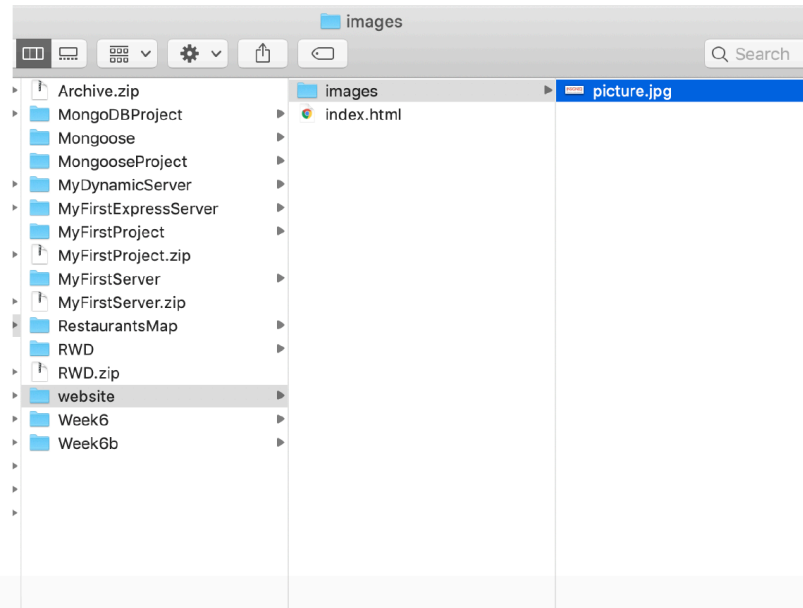




Paths - in different folders

- In Index.html:

`` picture.jpg is located in the images folder in the current folder





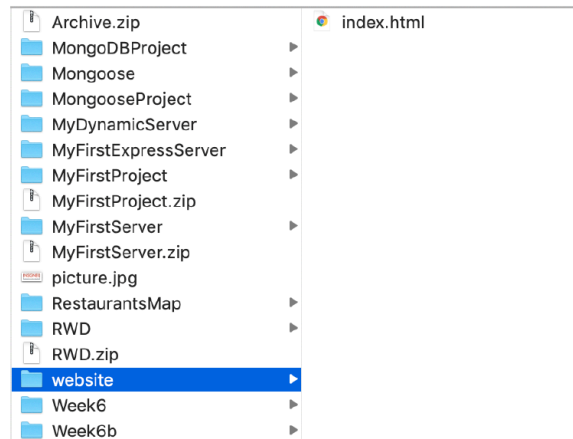
Paths - in upper folder

- In Index.html:

```

```

picture.jpg is located in the folder one level up from the current folder





Paths - as file system

Path	Description
<code></code>	picture.jpg is located in the same folder as the current page
<code></code>	picture.jpg is located in the images folder in the current folder
<code></code>	picture.jpg is located in the images folder at the root of the current web
<code></code>	picture.jpg is located in the folder one level up from the current folder