Comp 388/424 - Client-side Web Design

Spring Semester 2016 - Week 3

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Contents

HTML Basics - <body> - part 5

Adding a table

- organise data within a table starting with the `<table>` element
- three primary child elements include
  - *table row, table header, table data*
  - *`<tr>, <th>, <td>`*

```
<table>
<tr>
<th>header 1</th>
</tr>
<tr>
<td>row 1, cell 1</td>
</tr>
</table>
```

- also add a `<caption>`
- span multiple columns using the `colspan` attribute
- span multiple rows using the `rowspan` attribute

HTML Basics - <body> - part 6

Organising a list

- unordered list <ul>, ordered list <ol>, definition list <dl>
- and <ol> contains list items

```
<ul>
<li>...</li>
</ul>
```

```
<ol>
<li></li>
</ol>
```

- definition list uses <dt> for the item, and <dd> for the definition

```
<dl>
<dt>Game 1</dt>
<dd>our definition</dd>
</dl>
```

HTML Basics - <body> - part 7

Using forms

- used to capture data input by a user, which can then be processed by the server
- `<form>` element acts as the parent wrapper for a form
- `<input>` element for user input includes options using the *type* attribute
  - *text, password, radio, checkbox, submit*

```
<form>
Text field: <input type="text" name="textfield" />
</form>
```

- process forms using
  - *eg: JavaScript, PHP...*

DOM Basics - intro

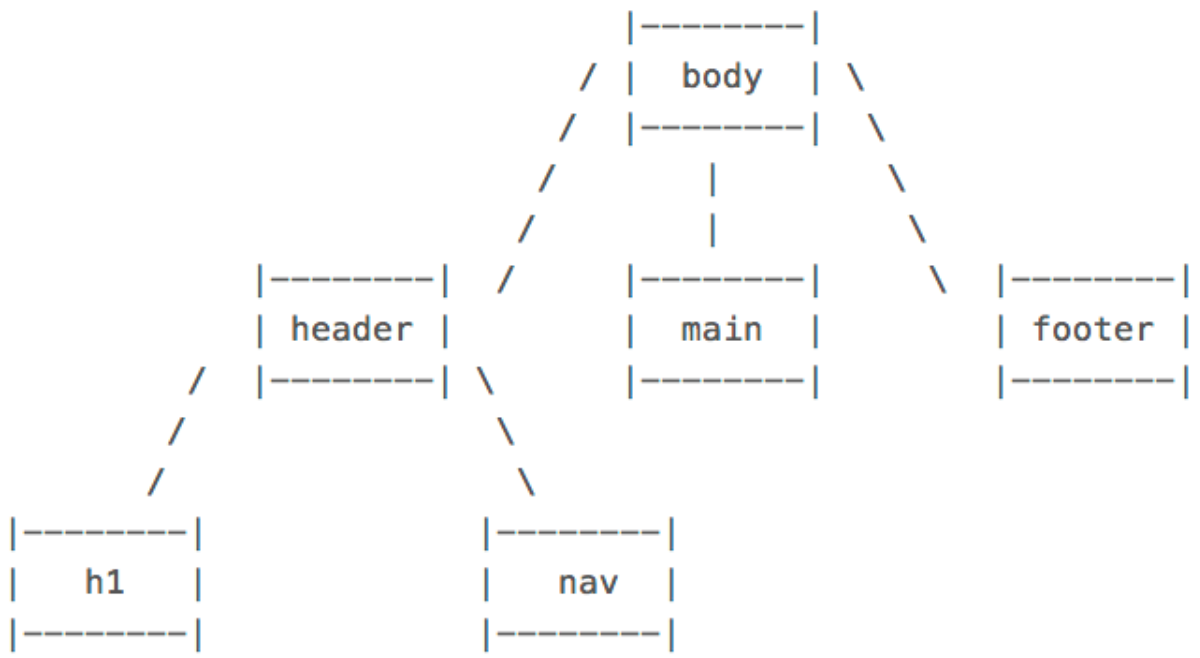
A brief introduction to the document object model (DOM).

This is particularly useful for CSS styling, and manipulating an underlying HTML document with JavaScript.

DOM Basics - what is DOM?

- presents a platform and language independent way to access and manipulate the underlying structure of our HTML document
- structured as a representation of a tree data structure
  - *its manipulation follows this same, standard principle*
- DOM tree is constructed using a set of nodes
  - *tree is designed as a hierarchical representation of the underlying document*
- each node on our tree is an element within our HTML document
- inherent hierarchical order originates with the *root* element
  - *at the top of our tree*
  - *descends down following lineage from node to node*
- each node is a child to its parent
  - *we can find many siblings per node as well*

Image - HTML DOM



HTML DOM

DOM Basics - useful elements

element tag	usage & description
<html>	container element for a HTML document
<head>	contains metadata and document information
<body>	contains main content rendered as the HTML document
<header>	page header...
<nav>	navigation, stores and defines a set of links for internal or external navigation
<main>	defined primary content area of document
<footer>	page footer...
<section>	a section of a page or document
<article>	suitable for organising and containing independent content
<aside>	defines content aside from the content which contains this element
<figure>	logical grouping of image and caption
<img>	image - can be local or remote using url in src attribute
<figcaption>	image caption
<h1>, <h2>...	headings from 1 to 6 (1 = largest)
<a>	anchor - link to another anchor, document, site...
, , <dl>	unordered, ordered, definition lists
	list item, used with , ...
<dt>	definition term, used with <dl>
<dd>	definition description, used with <dl>
<table>	standard table with rows, columns...
<tr> >	table row, used with <table>
<th>	table heading, used with <table> and child to <tr>
<td>	table cell, used with <table> and child to <tr>
	non-semantic container for content, similar concept to <section>
	group inline elements in a HTML document

`<canvas>`	HTML5 element for drawing on the HTML page
`<video>`	HTML5 element for embedding video playback
`<audio>`	HTML5 element for embedding audio playback

NB: *`<div>` and `<span>` can be used as identifiers when there is no other suitable element to define parts of a HTML5 document.*

DOM Basics - sample

```
<!DOCTYPE html>
<html>
<head>
<base href="media/images/">
<meta charset="UTF-8">
<!-- week 3 - demo 1 -->
<title>Week 3 - Demo 1</title>
</head>
<body>
  <header>
  <h1>Ancient Egypt</h1>
  </header>
  <nav></nav>
  <main>
    <section>
      <p>
        Welcome to the Ancient Egypt information site.
      </p>
      <figure>
        <img src="philae-demo2.jpg" alt="philae temple" width="333px"
        height="200px">
        <figcaption>Ptolemaic temple at Philae, Egypt</figcaption>
      </figure>
    </section>
    <aside>
      Temple at Philae in Egypt is Ptolemaic era of Egyptian history.
    </aside>
  </main>
  <footer>
    foot of the page...
  </footer>
</body>
</html>
```

- Demo 1 - DOM Sample

HTML - <head> element

- part of a HTML document's metadata
- allows us to set metadata for a HTML page
- customised just for that page or replicated as a site-wide implementation
- we can add numerous additional elements to <head>
- add similar links and code for JavaScript
  - *use the <script> element & attributes such as type and src*

```
<script type="text/javascript" src="script.js">
```

- add a <title> element with text added as the element content
- set a default base address for all relative URLs in links within our HTML

```
<base href="/media/images/" target="_blank">
```

- links now simply use the base URL or override with full URL

```
<img src="image.jpg">
<a href="http://www.flickr.com">Flickr</a>
```

HTML - <head> element example

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

  <title>Sample...</title>
  <meta name="description" content="sample metadata">
  <meta name="author" content="COMP424">

  <link rel="stylesheet" type="text/css" href="style.css">
  <script type="text/javascript" src="script.js">

</head>
```

CSS Basics - intro

- CSS allows us to define stylistic characteristics for our HTML
  - *helps us define how our HTML is displayed and rendered*
  - *colours used, font sizes, borders, padding, margins, links...*
- CSS can be stored
  - *in external files*
  - *added to a `<style>` element in the `<head>`*
  - *or embedded as inline styles per element*
- CSS not intended as a replacement for encoding semantic and stylistic characteristics with elements
- add a link to our CSS stylesheet using the `<style>` element.

```
<link rel="stylesheet" type="text/css" href="style.css" />
```

- change will replicate throughout our site wherever the stylesheet is referenced
- embed styles per element using **inline** styles
  - *limitations and detractors for this style of CSS*
  - *helped by the growth and popularity of React...*

CSS Basics - pros

Pros

- inherent option and ability to abstract styles from content
- isolating design styles and aesthetics from semantic markup and content
- cross-platform support offered for many aspects of CSS
  - *CSS allows us to style once, and apply in different browsers*
  - *a few caveats remain...*
- useful frameworks such as Bootstrap
- support many different categories of device
  - *mobile, screen readers, print, TVs...*
- accessibility features

CSS Basics - cons

Cons

- still experience issues as designers with rendering quirks for certain styles
  - *border styles, wrapping, padding, margins...*
- everything is global
  - *CSS matches required selectors against the whole DOM*
  - *naming strategies can be awkward and difficult to maintain*
- CSS can become a mess very quickly
  - *we tend to add to CSS instead of deleting*
  - *can grow very large, very quickly...*

CSS Basics - intro to syntax

- simple, initial concepts for CSS syntax
- follows a defined syntax pattern, eg:
- selector
  - *eg: body or p*
- declaration
  - *property and value pairing*

```
body {
  color: black;
  font-family: "Times New Roman", Georgia, Serif;
  }
```

CSS Basics - rulesets

- a CSS file is a group of rules for styling our HTML documents
- rules form **rulesets**, which can be applied to elements within the DOM
- rulesets consist of the following,
  - *a selector - `p`*
  - *an opening brace - `{`*
  - *a set of rules - `color: blue`*
  - *a closing brace - `}`*
- for example,

```
body {
  width: 900px;
  color: #444;
  font-family: "Times New Roman", Georgia, Serif;
  }
```

- HTML Colour Picker

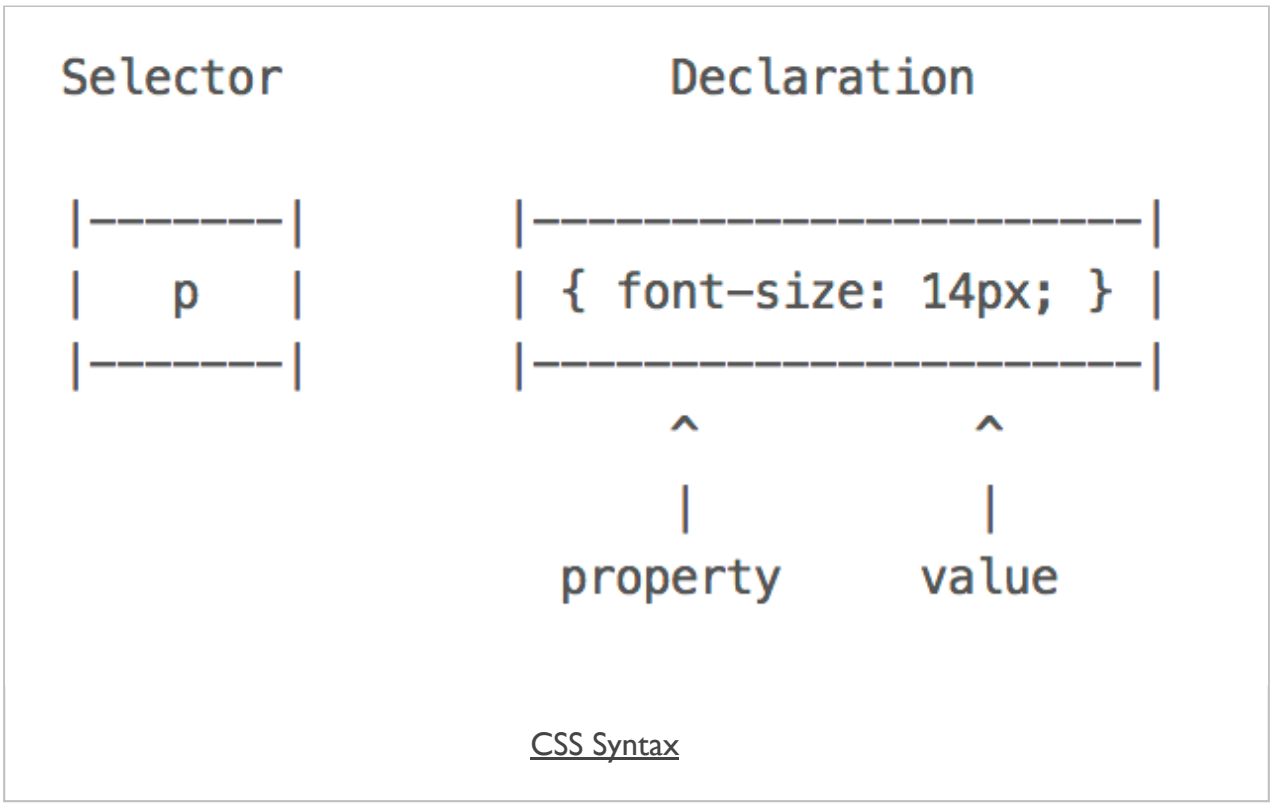
CSS Basics - comments

- add comments to help describe the selector and its properties,

```
/* color can be set to a named value or HEX value (eg: #444) */
p {
  color: blue;
  font-size: 14px;
  }
```

- comments can be added before the selector or within the braces

Image - CSS Syntax



CSS Syntax

CSS Basics - display

- display HTML elements in one of two ways
  - *inline - eg: `a` or `span`*
  - *displays content on the same line*

```
<div class="content">
  <p>
    <a href="...">Philae</a> is a <span>Ptolemaic</span> era temple in Egypt.
  </p>
</div>
```

- more common to display elements as `block-level` instead of `inline` elements
- element's content rendered on a new line outside flow of content
- a few sample block elements include,
  - *article, div, figure, main, nav, p, section...*
- *block-level* is not technically defined for new elements in HTML5

CSS Basics - inline elements

Current inline elements include:

- b | big | i | small | tt
- abbr | acronym | cite | code | dfn | em | kbd | strong | samp | var
- a | bdo | br | img | map | object | q | script | span | sub | sup
- button | input | label | select | textarea

Source - MDN - Inline Elements

CSS Basics - block-level elements

Current block-level elements include:

- address | article | aside | blockquote | canvas | dd | div | dl
- fieldset | figure | figcaption | footer | form
- h1 | h2 | h3 | h4 | h5 | h6
- header | hgroup | hr | main | nav | noscript
- ol | output | p | pre | section | table | tfoot | ul | video

Source - MDN - Block-level Elements

CSS Basics - HTML5 content categories - part 1

- *block-level* is not technically defined for new elements in HTML5
- now have a slightly more complex model called **content categories**
- includes three primary types of content categories

These include,

- **main content categories** - describe common content rules shared by many elements
- **form-related content categories** - describe content rules common to form-related elements
- **specific content categories** - describe rare categories shared by only a small number of elements, often in a specific context

CSS Basics - HTML5 content categories - part 2

- **Metadata content** - modify presentation or behaviour of document, setup links, convey additional info...
  - *<base>, <command>, <link>, <meta>, <noscript>, <script>, <style>, <title>*
- **Flow content** - typically contain text or embedded content
  - *<a>, <article>, <canvas>, <figure>, <footer>, <header>, <main>...*
- **Sectioning content** - create a section in current outline to define scope of <header> elements, <footer> elements, and *heading* content
  - *<article>, <aside>, <nav>, <section>*
- **Heading content** - defines title of a section, both explicit and implicit sectioning
  - *<h1>, <h2>, <h3>, <h4>, <h5>, <h6>, <hgroup>*

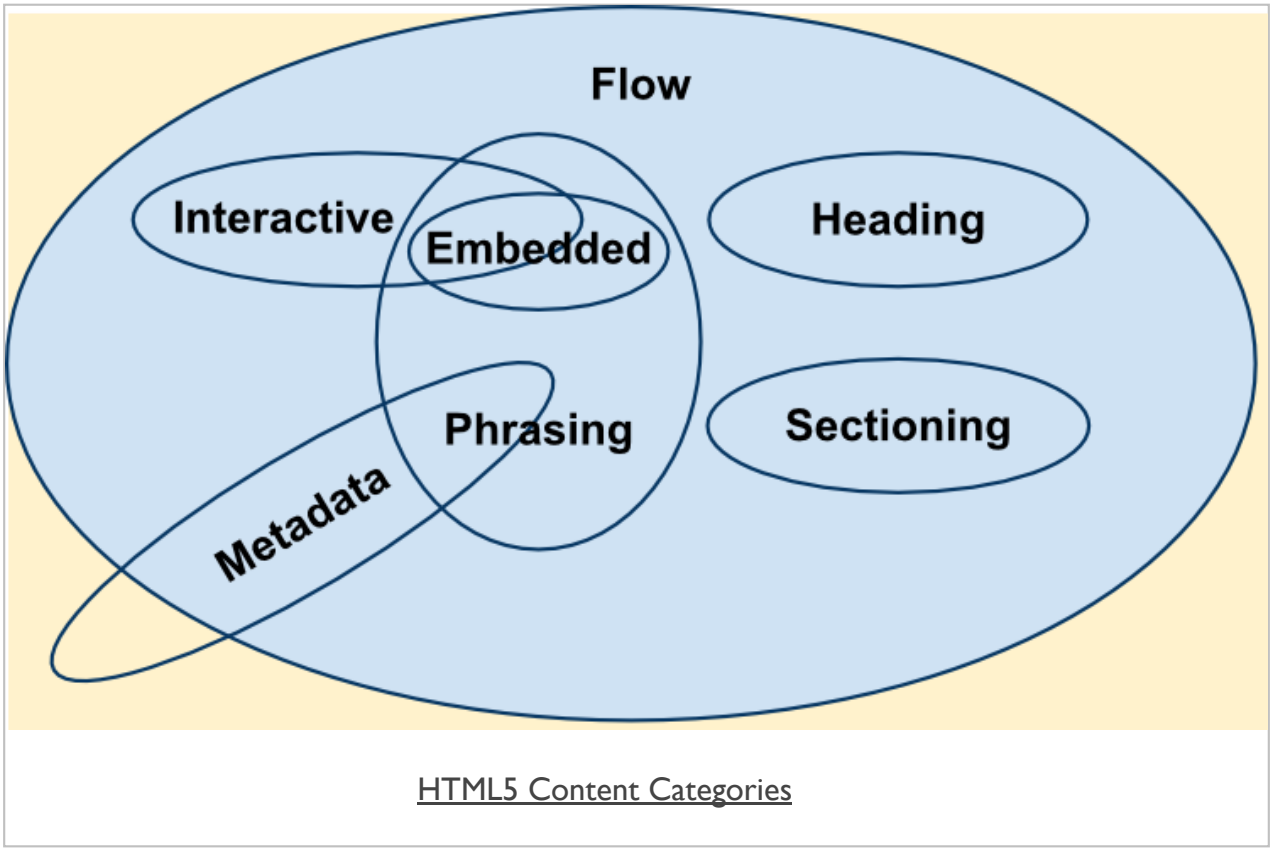
Source - MDN Content Categories

CSS Basics - HTML5 content categories - part 3

- **Phrasing content** - defines the text and the mark-up it contains
  - *`<audio>`, `<canvas>`, `<code>`, `<img>`, `<label>`, `<script>`, `<video>`...*
  - *other elements can belong to this category if certain conditions are met. eg: `<a>`*
- **Embedded content** - imports or inserts resource or content from another mark-up language or namespace
  - *`<audio>`, `<canvas>`, `<embed>`, `<iframe>`, `<img>`, `<math>`, `<object>`, `<svg>`, `<video>`*
- **Interactive content** - includes elements that are specifically designed for user interaction
  - *`<a>`, `<button>`, `<details>`, `<embed>`, `<iframe>`, `<keygen>`, `<label>`, `<select>`, `<textarea>`*
  - *additional elements, available under specific conditions, include*
  - *`<audio>`, `<img>`, `<input>`, `<menu>`, `<object>`, `<video>`*
- **Form-associated content** - elements contained by a form parent element
  - *`<button>`, `<input>`, `<label>`, `<select>`, `<textarea>`...*
  - *there are also several sub-categories, including listed, labelable, submittable, resettable*

Source - MDN Content Categories

Image - HTML5 Content Categories



HTML5 Content Categories

Source - MDN - Content Categories

CSS Basics - box model - part 1

- consideration of the CSS box model
- a document's attempt to represent each element as a rectangular box
- boxes and properties determined by browser rendering engine
- browser calculates size, properties, and position of these required boxes
- properties can include, for example,
  - *colour, background features, borders, width, height...*
- box model designed to describe an element's required space and content
- each box has the standard four edges,
  - ***margin*** *edge*
  - ***border*** *edge*
  - ***padding*** *edge*
  - ***content*** *edge*

CSS Basics - box model - part 2

Content

- box's **content area** describes element's actual content
- Properties can include `color`, `background`, `img`...
  - *apply inside the **content** edge*
- dimensions include **content width** and **content-height**
- content size properties (assuming that the `box-sizing` property remains default) include,
  - *`width`, `min-width`, `max-width`, `height`, `min-height`, `max-height`*

Demo - CSS Box Model

- Demo 2 - Box Model

Padding

- box's **padding area** includes the extent of the padding to the surrounding border
- background, colour etc properties for a content area extend into the padding
  - *we often consider the padding as extending the content*
- padding itself is located in the box's **padding edge**
- dimensions are the width and height of the **padding-box**.
- control space between padding and content edge using the following properties,
  - `padding-top`, `padding-right`, `padding-bottom`, `padding-left`
  - `padding` *(sizes calculated clock-wise)*

Demo - CSS Box Model Padding

- JSFiddle - Demo

Border

- **border area** extends **padding area** to area containing the borders
- it becomes the area inside the **border edge**
- define its dimensions as the width and height of the **border-box**
- calculated area depends upon the width of the `border` we set in the CSS
- set size of our border using the following properties in CSS,
  - *`border-width`*
  - *`border`*

Demo - CSS Box Model Border

- JSFiddle - Demo

CSS Basics - box model - part 5

Margin

- **margin area** can extend this border area with an empty area
  - *useful to create a defined separation of one element from its neighbours*
- dimensions of area defined as width and height of the **margin-box**
- control size of our margin area using the following properties,
  - *`margin-top`, `margin-right`, `margin-bottom`, `margin-left`*
  - *`margin` (sizes calculated clock-wise)*

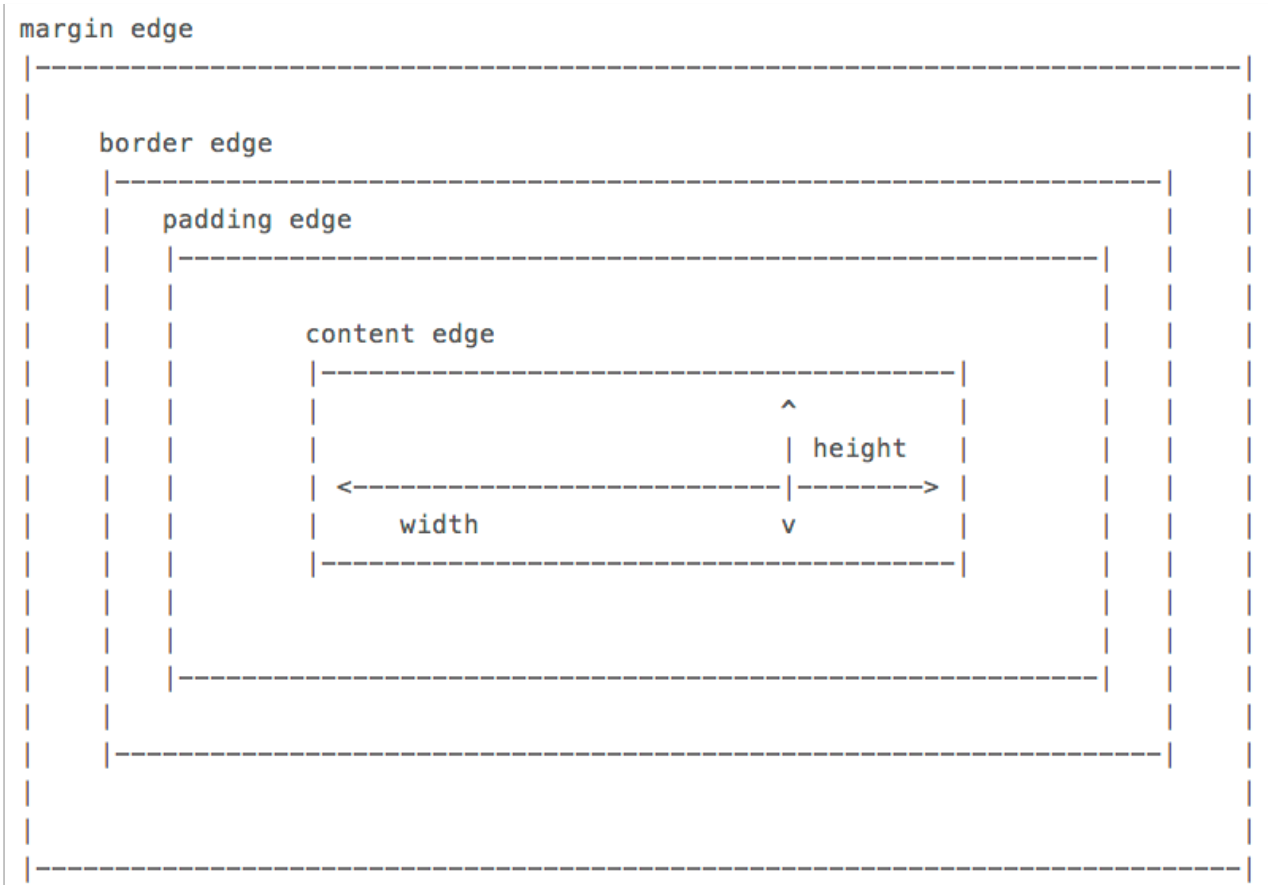
Demo - CSS Box Model Margin

- JSFiddle - Demo

Demo - CSS Box Model

- Demo 2 - Box Model

Image - CSS Box Model



CSS Box Model

Source - MDN - CSS Box Model

CSS Basics - selectors

- **selectors** are a crucial part of working with CSS
- basic selectors such as

```
p {
  color: #444;
}
```

- above ruleset adds basic styling to our paragraphs
  - *sets the text colour to HEX value 444*
- simple and easy to apply
  - *applies the same properties and values to all paragraphs*
- specificity requires classes, pseudoclasses...

CSS Basics - classes

- add a **class** attribute to an element, such as a <p>
  - *can help us differentiate elements*
- also add a **class** to any DOM element
  - *eg: add different classes to multiple <p> elements*

```
<p class="p1">paragraph one...</p>
<p class="p2">paragraph two...</p>
```

- we can now select our paragraphs by class name within the DOM
- then apply a **ruleset** for each class
- style this class for a specific element

```
p.p1 {
  color: #444;
}
```

- style all elements with the class `p1`, and not just <p> elements

```
.p1 {
  color: #444;
}
```

CSS Basics - pseudoclasses

- add a class to links or anchors, styling all links with the same ruleset
- we might also want to add specific styles for different link states
- styling links with a different colour
  - *eg: whether a link has already been used or not*

```
a {
  color: blue;
  }

a:visited {
  color: red;
  }
```

- `visited` is a CSS **pseudoclass** applied to the <a> element
- browser implicitly adds this pseudoclass for us, we add style

```
a:hover {
  color: black;
  text-decoration: underline;
}
```

- pseudoclass for link element, <a>, `hover`

CSS Basics - complex selector - part 1

- our DOM will often become more complicated and detailed
- depth and complexity will require more complicated selectors as well
- lists and their list items are a good example

```
<ul>
  <li>unordered first</li>
  <li>unordered second</li>
  <li>unordered third</li>
</ul>
<ol>
  <li>ordered first</li>
  <li>ordered second</li>
  <li>ordered third</li>
</ol>
```

- two lists, one unordered and the other ordered
- style each list, and the list items using rulesets

```
ul {
  border: 1px solid green;
}
ol {
  border: 1px solid blue;
}
```

Demo - Complex Selectors - Part 1

- Demo 3 - Complex Selectors Part 1

CSS Basics - complex selector - part 2

- add a ruleset for the list items, `<li>`
- applying the same style properties to both types of lists
- more specific to apply a ruleset to each list item for the different lists

```
ul li {
  color: blue;
}
ol li {
  color: red;
}
```

- also be useful to set the background for specific list items in each list

```
li:first-child {
  background: #bbb;
}
```

- pseudoclass of `nth-child` to specify a style for the second, fourth etc child in the list

```
li:nth-child(2) {
  background: #ddd;
}
```

Demo - Complex Selectors - Part 2

- Demo 4 - Complex Selectors Part 2

CSS Basics - complex selector - part 3

- style odd and even list items to create a useful alternating pattern

```
li:nth-child(odd) {
  background: #bbb;
}
li:nth-child(even) {
  background: #ddd;
}
```

- select only certain list items, or rows in a table etc
  - *eg: every fourth list item, starting at the first one*

```
li:nth-child(4n+1) {
  background: green;
}
```

- for **even** and **odd** children we're using the above with convenient shorthand
- other examples include
  - `last-child`
  - `nth-last-child()`
  - *many others...*

Demo - CSS Complex Selectors - Part 3

- Demo 5 - Complex Selectors Part 3

Next week - Quiz

Next week's quiz will include the following,

- everything covered in the first three weeks of the course
  - *includes today's lecture*
  - *further details on the course website as part of this week's assignment*

CSS - test and try out

- JSFiddle - Box Model

Demos

- Demo 1 - DOM Basics
- Demo 2 - Box Model
- Demo 3 - Complex Selectors Part 1
- Demo 4 - Complex Selectors Part 2
- Demo 5 - Complex Selectors Part 3

References

- CSS Tricks - nth child recipes
- JSFiddle - CSS Basics
- MDN - CSS
- CSS box model
- MDN - HTML developer guide
- Block-level elements
- Content categories
- Inline elements
- Perishable Press - Barebones Web Templates
- W3 CSS
- W3 Schools - CSS
- W3 Schools - HTML Block and Inline Elements
- W3 Schools - HTML Colour Picker
- W3 Web Style Sheets - Even & Odd