

Objectives

- Review: Web, HTML
- CSS: Presentation of Web Pages
- Afternoon: Project discussion/planning

Web Review

- What made the WWW possible?
- What are the main applications that enable the Web?
 - What protocol do they use to communicate?
- How does the process of retrieving a page work?

HTML Review

- What is used to markup a document?
 - What are its components?
- What are the two main types of elements?
 - How are they different?
- How do we make...
 - A heading
 - A link
 - An image
 - A table
 - A list

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Lab 0

- How did Lab 0 go?
 - Wiki?
 - Validating your page?
- Anything tricky?
- Any questions?

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cs.wlu.edu's Web Server Set Up

- How ~user directs to user's public_html directory

```
<IfModule mod_userdir.c>
#
# UserDir is disabled by default since it can confirm the presence
# of a username on the system (depending on home directory
# permissions).
#
#
# To enable requests to /~user/ to serve the user's public_html
# directory, remove the "UserDir disabled" line above, and
# uncomment the following line instead:
#
UserDir /home/www/users
</IfModule>
```

cs.wlu.edu's Web Server Set Up

- How ~user directs to user's public_html directory
- In each user's home directory, there is a symbolic link:

```
public_html -> /home/www/users/sprenkle/
```

cs.wlu.edu's Web Server Set Up

- Location of “main” web pages

```
#  
# DocumentRoot: The directory out of which you will serve your  
# documents. By default, all requests are taken from this directory, but  
# symbolic links and aliases may be used to point to other locations.  
#  
DocumentRoot "/var/www/html"
```

cs.wlu.edu's Web Server Set Up

- Why when you go to a directory in the browser, you see index.html

```
#  
# DirectoryIndex: sets the file that Apache will serve if a directory  
# is requested.  
#  
<IfModule dir_module>  
    DirectoryIndex index.html  
</IfModule>
```

Rules vs Conventions

Rules

- Absolutes that cannot be violated
- The browser will enforce rules
 - If you forget to add an ending tag for bold ``, then all of the text following the opening `` tag will appear bold.
- Modern browsers often attempt to fix sloppy HTML by predicting and fixing *some* violations of rules
 - This is NOT an excuse to write poor, incorrect HTML
 - Some browsers or future versions of them may not be so forgiving

Conventions

- Suggested ways of writing code by consensus
- The browser doesn't care about conventions
- The end user viewing your site doesn't care or realize there were conventions followed
- Purely for others who may revise or build upon your code
 - Clear organization
 - Consistent style
 - Highly readable

Presentation and Style

CSS: CASCADING STYLE SHEETS

Presentation of Web Pages

- Talked mostly about structure and content of HTML pages
- Want presentation to be *separate*
 - In general, don't encode style into the HTML page itself
 - Easier to apply different styles to a set of web pages or a whole web site

<http://www.csszengarden.com/>

Cascading Style Sheets (CSS)

- Describe the **appearance**, **layout**, and **presentation** of information on a web page
 - **How** information is to be displayed, not what is being displayed
- CSS is designed to specify style
 - HTML is not
- Can be embedded in HTML document or placed into separate **.CSS** file
 - Separate **.CSS** file advantage: one style sheet can be *shared* across many HTML documents

Why *Cascading* Style Sheets?

- **Cascading** because the attributes of an element cascade together in this order:
 - Browser's default styles
 - external style sheet files (in a `<link>` tag)
 - internal style sheets (inside a `<style>` tag in the page's header)
 - inline style (the **style** attribute of the HTML element)



Attaching a CSS File: `<link>`

- **link** appears in **head** element
- Can link to multiple style sheet files
 - When > 1 style sheet defines a style for the same HTML element, latter sheet's properties are applied

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

- Example from W&L site:

```
<link rel="stylesheet" type="text/css"
href="https://www.wlu.edu/assets/css/global.css?v=1.1" />
<link
href="https://cdnjs.cloudflare.com/ajax/libs/normalize/3.0.1/normalize.
min.css" media="all" rel="stylesheet" type="text/css" />
<link href="/assets/css/pages/homepage.css" media="all"
rel="stylesheet" type="text/css" />
```

Takes precedence

Basic CSS Rule Syntax

- A CSS file consists of one or more rules
- Each rule starts with a **selector** that specifies an HTML element
 - Applies style **properties** to the **element**
 - Properties have **values**

```
selector {  
  property: value;  
  property: value;  
  ...  
  property: value;  
}
```

```
p {  
  font-family: sans-serif;  
  color: blue;  
}
```

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What Can You Specify Styles For?

- CSS Categories
 - Colors
 - Fonts
 - Lists
 - Alignment of Text
 - Backgrounds
 - Borders
 - Margins

Provide Overview
of Properties

Resources on Wiki

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CSS Properties for Colors

- **color**: color of the element's text
- **background-color**: color that will appear behind the element

```
p {  
    color: red;  
    background-color: black;  
}
```

This paragraph uses the above style.

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Specifying Colors

- Color names recognized by all browsers:
 - aqua, black, blue, fuchsia, gray, green, lime, maroon, navy, olive, purple, red, silver, teal, (white), yellow
- **RGB codes**: red, green, and blue values from 0 (none) to 255 (full)
- **Hex codes**: RGB values in base-16 from 00 (0, none) to FF (255, full)

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Specifying Colors Examples

- Use Color Names, RGB code, or Hex Code

```
p { color: red; }  
h2 {color: rgb(128, 0, 196); /* purple */ }  
h3 { color: #FF8800; /* orange */ }
```

This paragraph uses the first style.

This heading uses the second style.

This heading uses the third style.

- Color references on Wiki Resources page

CSS Comments

- Use `/* */` style comments
- CSS (and HTML) are not commented as rigorously as programming language code
- The `//` single-line comment is NOT supported in CSS

```
/* CSS Comment.  
Can span multiple lines. */  
p { color: red; }
```

FONTS, TEXT

CSS Properties for Fonts

Property	Meaning
font-family	which font will be used
font-size	how large the letters will be drawn
font-style	used to enable/disable italic style
font-weight	used to enable/disable bold style

font-family

- Examples:

```
p { font-family: "Georgia"; }  
h2 { font-family: "Arial Narrow"; }
```

- Multi-name font names should be in quotes

This paragraph uses the first style.
This heading uses the second style.

font-family

- Can specify multiple font names from highest to lowest priority
 - Use generic font name last

```
p { font-family: "Garamond",  
"Times New Roman", serif; }
```

This paragraph uses the above style.

In Times New Roman b/c
Garamond not installed

- Generic font names:
 - serif, sans-serif, *cursive*, *fantasy*, monospace
 - Keywords, so no quotation marks

Possible Values for font-size

- Vague font sizes: **xx-small**, **x-small**, **small**, **medium**, **large**, **x-large**, **xx-large**
- Relative font sizes: **smaller**, **larger**
- Percentage font sizes, e.g., **90%** or **120%**
- Units: pixels (**px**), points (**pt**), m-size (**em**), x-height (**ex**)
 - 16px, 16pt, 1.16em, 1.16ex (no spaces)

```
p { font-size: large; }
```

This paragraph uses the above style.

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em

- An **em** is a unit in the field of typography, equal to the currently specified point size.
- For example, one em in a 16-point typeface is 16 points. Therefore, this unit is the same for all typefaces at a given point size.
- The em dash (—) and em space () are each one *em* wide.
- Typographic measurements using this unit are frequently expressed in decimal notation (e.g., 0.7 em) or as fractions of 100 or 1000 (e.g., 70/100 em or 700/1000 em).
- The name **em** was originally a reference to the width of the capital *M* in the **typeface** and size being used, which was often the same as the point size

M

Source: [http://en.wikipedia.org/wiki/Em_\(typography\)](http://en.wikipedia.org/wiki/Em_(typography))

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font-weight and font-style

- Either can be set to **normal** to turn them off
 - Such as for heading tags

```
p { font-weight: bold;
    font-style: italic; }
```

This paragraph uses the above style.

body Style

- Apply a style to the **body** element to apply a style to the entire body of your page
- Advantage: don't need to apply a style to each element

```
body {
  color: #666666;
  font-size: 14px;
}
```

W3C CSS Validator

jigsaw.w3.org/css-validator/

- Checks your CSS to make sure it meets the official CSS specifications
- More picky than the web browser, which may render malformed CSS correctly

Practice Problem: Simpsons

- Add a style sheet to the page
- Entire page should have a Simpsons-yellow background and use 14 pt font
- Main heading should use “Comic Sans MS” font
- Lists should appear in “Lucida Console” font
- Link text should be red
- List bullets should have a blue background
- List items should have a green background

Goal: Identify the tag and the CSS property and value

Why `` and ``,
not `<i>` and `` ?

```
strong { font-weight: normal; color: red; }  
em { font-style: normal; color: #ff00ff; }
```

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Why `` and ``,
not `<i>` and `` ?

- **strong** and **em** describe attributes of the content (*semantics*)
 - “This is something important in the document.”
- **b** and **i** describe formatting and presentation
 - “I want this to be bold.”
- Add style to **strong** and **em** to do something other than bold or italics
 - What would this do?

```
strong { font-weight: normal; color: red; }  
em { font-style: normal; color: #ff00ff; }
```

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CSS Text Properties Subset

Property	Meaning
text-align	Alignment of text within its element, e.g., left , right , center , or justify
text-decoration	Decorations, such as underline , line-through , blink Can be combined
line-height , word-spacing , letter-spacing	Gaps between the various portions of text
text-indent	Indents the first line of a text

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CSS Properties for Dimensions

- **width, height:**
 - How wide or tall to make this element
 - Specified as percentage of frame or in pixels
- **max-width, max-height, min-width, min-height:**
 - Maximum or minimum size of this element in the given dimension

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[Course's sidebar](#)

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Grouping Styles

- A style can select multiple elements separated by commas
- The given properties will be applied to all of the elements

```
p,h1,h2 { color: blue; }  
h2 { background-color: yellow;}
```

This paragraph uses the above style.

This heading uses the above style(s).

- Individual elements can also have their own styles (like `h2` above)

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Document Tree

- HTML document's elements can be viewed as a tree

```
<html>  
  <head><title>My Web Page</title></head>  
  <body>  
    <h1>My Web Page</h1>  
    <p>My Favorite Movies: </p>  
    <ul>  
      <li>Tombstone</li>  
      <li>The Muppet Movie</li>  
    </ul>  
  </body>  
</html>
```

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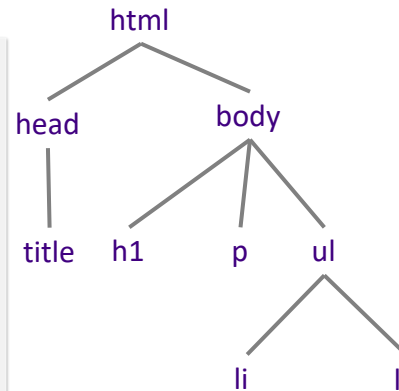
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Document Tree

- HTML document's elements can be viewed as a tree

```
<html>
  <head><title>My Web Page
  </title></head>
  <body>
    <h1>My Web Page</h1>
    <p>My Favorite Movies: </p>
    <ul>
      <li>Tombstone</li>
      <li>The Muppet Movie</li>
    </ul>
  </body>
</html>
```



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Inheriting Styles

- Elements inherit their parents' styles
- A more tightly matching rule can override a more general inherited rule
- Not all properties are inherited
 - Example: Borders are not inherited
 - Some have default, overriding styles

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Simpsons CSS Practice

- All headings should be centered, bolded
- Images should be 250 pixels wide
- List items should only take up 1/2 of the width of the screen
- The text should be spaced so that the lines are further apart
- Links should be slightly larger than the other text on the page

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CSS Classes

- Selectively apply a CSS rule to only elements of a specific class
 - Give a style to some occurrences of an element
- From course schedule page:
 - Set the background color for a row in the table, if its class is “even”

```
tr.even { background: #D8DFE7; }
```

```
<table>  
  <tr class="even"><td>...</td></tr>  
  <tr class="odd"><td>...</td></tr>  
</table>
```

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CSS Class Selector Without Element

- Selectively applies a style to *any* element that is part of the class

```
.smallCaps { font-variant: small-caps; }
```

```
<h2 class="smallCaps">Heading 2</h2>  
<p class="smallCaps">Paragraph Example</p>
```

HEADING 2
PARAGRAPH EXAMPLE

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CSS ID Selectors

- Selectively applies a CSS rule to only the elements that have a particular **id**
- Differs from class selector in that an id can only be used once in the HTML document
 - Page won't validate otherwise
- HTML element can be omitted
 - Rule will apply to any element with given ID

```
element#id { ... }
```

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CSS ID Selectors

- Course Web Page Example:

```
#sidebar {  
  color: #b2f;  
  background-color: transparent;  
  width: 8em;  
  padding: 1ex 0;  
  border: 1px solid rgb(204,204,204);  
  position: absolute;  
  left: 4px;  
  top: 141px;  
}
```

```
<div id="sidebar"><!-- sidebar --></div>
```

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id vs class

id

- Unique on the page
- Access in HTML for form labels and # references in URLs
- Permits direct CSS and JavaScript access to an element
- Only one attribute per element and one name as a val

class

- Any number of references on a single page
- Only one attribute per element but multiple can be defined in its value, separated by spaces
- Most useful for making mass changes through CSS

Both

- Name must begin with a letter
- Name must have no spaces (use _ or - instead)
- Tags can only have one attribute defined in each
 - even though a class can have multiple values within it

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GROUPING ELEMENTS

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Inline Styling Sections: ``

- Has no onscreen appearance
- Can apply a style or ID to it
 - applied to the text inside the `span`

```
<p>Here is some text in  
<span class="smallCaps">Small Caps</span>.  
</p>
```

Here is some text in SMALL CAPS.

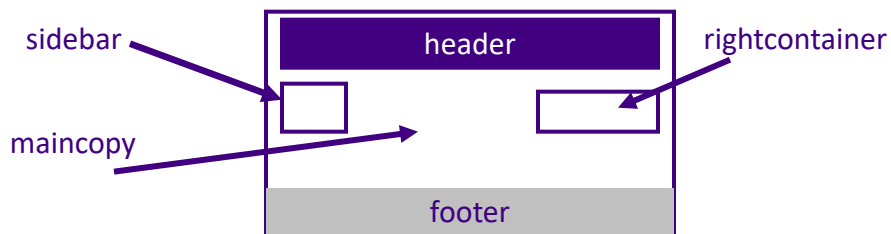
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Logical Divisions in HTML: `<div>`

- Denotes a section or division of an HTML document (block-level)
- Has no on-screen appearance
- Can apply a style or id to it
 - Inherited by all elements inside the `div`
- Powerful for layouts, presentation



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Further HTML Structure

- Introduced in HTML5
- Allow us to semantically structure the content to promote organization and readability
- Examples:
 - `<header>`
 - `<main>`
 - `<nav>`
 - `<section>`
 - `<article>`
 - `<aside>`
 - `<footer>`

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HTML5 Semantic Elements

Element	Represents	Example Use
<code><header></code>	Introductory content at the beginning of a page, section, or article	Logo, heading, search bar
<code><main></code>	dominant content of the body of a document	Focus of the page
<code><footer></code>	Content that typically signifies the end of a page, section, or article	Bottom of the page – copyright, authorship
<code><aside></code>	Content that is indirectly related to the document's main content	Sidebar, call-out box

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Comparing Grouping Elements

Element	Represents	Example Use
<code><article></code>	Self-contained content, could be independent of the page	a forum post, a blog entry, an article
<code><section></code>	A standalone section within a larger body of content. If separated from that other content, would lose meaning.	search results with a map and its controls
<code><div></code>	A generic container, doesn't add any semantic information	When an <code>article</code> or <code>section</code> doesn't apply

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<nav>

- Represents a section of code to provide navigation
 - Links to other documents
 - Links to places within the current document
- Examples: menu, table of contents
- Convention: within ...
 - <aside> element: vertical sidebar
 - <header> element: horizontal navigation

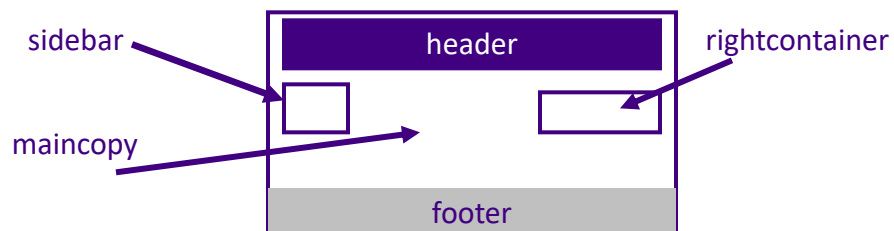
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Apply Semantic Elements

- What would be the appropriate element for each of these boxes?



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Grouping Tags in CSS

- Can group elements and give them a style
- Similar to use of **div** tag but for specific types of elements
- Example: **colgroup**
 - Groups together columns with same style
- More grouping tags on Thursday...

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Embedding Style Sheets: **<style>**

- Placed within a page's **head** element
- Preferred: linking to an external style sheet
 - Especially when many styles

```
<head>
<style type="text/css">
<!--
/* hide from browsers that can't handle */
p { font-family: sans-serif }
h2 { color: red }
-->
</style>
</head>
```

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Inline Styles with the **style** Attribute

- Higher precedence than embedded or linked styles
- Useful for one-time overrides

```
<p style="font-family: sans-serif; color: red;"> This is a red paragraph.</p>
```

Practice Problem

- Modify the Simpsons' CSS and HTML so that the second list item belongs to the "even" class
- An element in the "even" class has a gray background

CSS Background Properties

Property	Meaning/Values
background-color	Color to fill background
background-image	Image to place in background
background-position	Placement of bg image within an element
background-repeat	Whether/how bg image should be repeated; values= repeat (default), repeat-x , repeat-y , or no-repeat
background-attachment	Whether bg image scrolls within the page
background	Shorthand to set all background properties

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Advanced Selection

- Applies given properties to **selector2** only if it is *inside* a **selector1** on the page

```
selector1 selector2 {  
    properties  
}
```

- Applies given properties to **selector2** only if **selector1** is *directly* inside **selector2**

➤ no intermediate tags

```
selector1 > selector2 {  
    properties  
}
```

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Pseudo Classes

Class Name	Meaning
<code>active</code>	An activated or selected element
<code>focus</code>	An element that has the keyboard focus
<code>hover</code>	An element that has the mouse over it
<code>link</code>	A link that has not been visited
<code>visited</code>	A link that has already been visited
<code>first-child</code>	An element that is the first child of another

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Pseudo Classes

- Example uses:

```
a:link {color:#ff0000;} /* unvisited link */
a:visited {color: #00FF00} /* visited link */
a:hover {color: #FF00FF} /* mouse over link*/
a:active {color: #0000FF} /* selected link */
```

Modify so that unvisited links are blue,
but only if they're within a *paragraph*
inside of the **div** with id **sidebar**

- Course Web page Example

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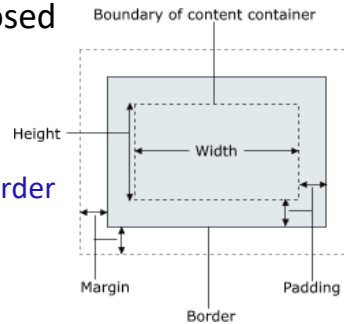
Other Properties

Property	Meaning, Values
list-style-type	Use with ol or ul . Some possible values: none , decimal , upper-roman , lower-alpha , square , ...
display	Sets the type of CSS box model an element is displayed with. Values: none , inline , block , run-in , compact , ... Use sparingly--can radically alter page layout
visibility	Sets whether an element should be shown onscreen. Element will still take up space onscreen but will not be shown; to make it not take up any space, set display to none instead. Values: visible (default) or hidden . Can be used to show/hide dynamic HTML content on the page in response to events

LAYOUT USING BOX MODEL

Layout Using CSS: Box Model

- For layout, every element is composed of:
 - element's content
 - border around the element
 - padding between the content and border (inside)
 - margin between border and other content (outside)
- $\text{width} = \text{content width} + \text{L/R padding} + \text{L/R border} + \text{L/R margin}$
- $\text{height} = \text{content height} + \text{T/B padding} + \text{T/B border} + \text{T/B margin}$
 - IE6 doesn't implement these correctly



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Border Properties

- Use **border** property to set borders on all 4 sides
- Properties specified in this order:

thickness	specified in px, pt, em, %, or a general widths: thin, medium, thick
style	One of none, hidden, dotted, dashed, double, groove, inset, outset, ridge, solid
color	specified as seen previously for text and background colors

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Border Properties

- Use **border** property to set borders on all 4 sides
 - `border: <thickness> <style> <color>;`
- To set specific properties of border on all 4 sides:
 - **border-color, border-width, border-style**
- All properties of a border on a particular side:
 - **border-bottom, border-left, border-right, border-top**
- A specific property on a particular side:
 - E.g., **border-bottom-color, border-bottom-style, border-bottom-width**

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Border Example

```
h1, h2 {  
  font-family: sans-serif;  
  color: gray;  
  border-bottom: 1px solid black;  
}
```

Heading 1

Heading 2

Unlike underline,
border extends to
edge of element's
width

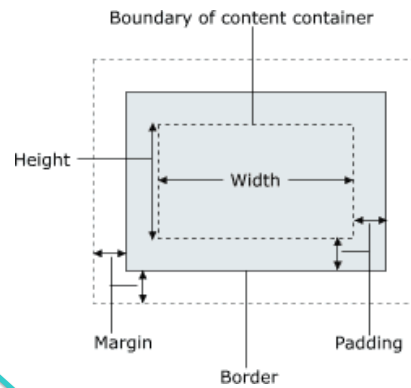
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Padding

- **padding**: padding on all 4 sides
 - If one value: all 4 sides
 - 2 values: top/bottom right/left
 - 3 values: top right/left bottom
 - 4 values: top right bottom left
- **padding-bottom**: padding on bottom side only
- **padding-left**: padding on left side only
- **padding-right**: padding on right side only
- **padding-top**: padding on top side only



You may have **TRouBLE** remembering the order at first

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Padding Example

```
p { padding: 20px; border: 3px solid black; }  
h2 { padding: 0px; background-color: yellow; }
```

↕
↔ This is the first paragraph

This is the second paragraph

This is a heading

Padding shares the element's background color

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Padding Example

Can set padding for each side separately:

```
p { padding-left: 200px;  
padding-top: 30px;  
background-color: fuchsia;  
}
```

This is the first paragraph

This is the second paragraph

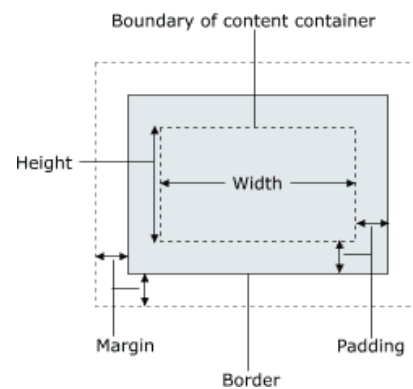
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Margins

- **margin**: margin on all 4 sides
 - If one value: all 4 sides
 - 2 values: top/bottom right/left
 - 3 values: top right/left bottom
 - 4 values: top right bottom left
- **margin-bottom**: margin on bottom side only
- **margin-left**: margin on left side only
- **margin-right**: margin on right side only
- **margin-top**: margin on top side only



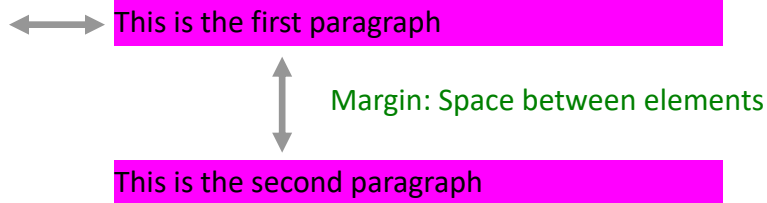
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Margin Example

```
p {  
  margin: 70px;  
  background-color: fuchsia;  
}
```



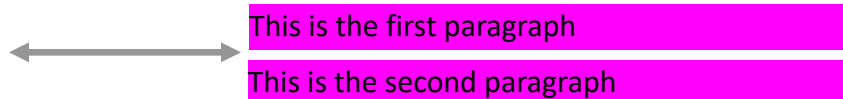
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Margin Example

```
p {  
  margin-left: 200px;  
  background-color: fuchsia;  
}
```



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FLOAT & CLEAR

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float Property

- **float** can have values **left**, **right**, or **none** (default)
- Floating elements are removed from normal document flow
- Underlying text wraps around floating element as necessary
- Usually has a **width** property
 - Otherwise, default is 100% width
 - Other text can't wrap around

Course web page:

[rightcontainer](#)

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Practice Problem

- Make images float to the right and text wraps around
- Add a margin of 20px around the image

Practice Problem



I t was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to heaven, we were all going direct the other way - in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only.

clear Property

- Disallows any floating elements from overlapping this element
 - This element will start “below” floating elements
- **clear** can be **left**, **right**, **both**, or **none** (default)

POSITIONING

position Property

Property	Meaning
static	default position
relative	offset from its normal static position, relative to block element that contains it
absolute	at a fixed position <i>within its containing element</i>
fixed	at a fixed position <i>within the browser window</i>

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fixed Position

- At a fixed position *within the browser window*
- **top, bottom, left, right** properties specify positions of box's corners
 - Can be negative to create an element that sits outside the visible browser window

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Sidebar

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Those Annoying Ads: **z-index**

- Sets which absolute positioned element will appear on top of another that occupies the same space
- Higher **z-index** wins
- Can be **auto** (default) or a number

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Bootstrap

<http://getbootstrap.com/>
<http://www.w3schools.com/bootstrap/>

- Free, open-source CSS framework
 - Develop responsive, mobile-first projects on the web
- Free front-end framework for faster and easier web development
- Includes HTML and CSS-based design templates for typography, forms, buttons, ...
 - optional JavaScript plugins
- Easily create responsive designs
- There are other frameworks, but Bootstrap is the most popular

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CSS Organization: Using Bootstrap

- Create your own separate CSS file and put your changes in that file
- Your custom CSS file should go *after* the Bootstrap CSS file in the <head> element

TODO

- Lab 1: CSS
 - Practice using Firefox's developer tools
 - Create your own home page
- Readings/summaries on Sakai forums
- Project – this afternoon!