CS472 WAP
Lecture 2: CSS

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Wholeness Statement

The basics of CSS give different visual styles to HTML elements, changing their preset default appearance.

CSS was a natural evolution to HTML that enhances the flexibility and sophistication of HTML for the specialized function of visual styling. *Nature evolves by creating encapsulated subsystems to handle specialized functionalities*

Content vs. Presentation

- HTML is for content, the information on the page
- CSS is for presentation, how to display the page
- Keeping content separate from presentation is a very important web design principle

- If the HTML contains no styles, its entire appearance can be changed by swapping `.css` files
- http://csszengarden.com/

Ways to Add CSS

External CSS: This is the preferred method and involves creating a separate CSS file with a .css extension.

Style Tag in <head>: Include CSS styling directly within the <head> section of your HTML document using the <style> tag

Inline Style Attribute: Adding CSS styling directly to an HTML element using the style attribute.

Method	Pros	Cons
External CSS	Most maintainable, reusable	Requires extra file
Style Tag in Head	No extra files	Less maintainable for complex sites
Inline Style Attribute	Very specific	Makes HTML code messy, hard to maintain

Basic CSS rule syntax

- A **CSS** file consists of one or more rules
- A rule's selector specifies HTML element(s) and applies style properties.
- The * **universal** selector selects all elements
- The **element** selector selects HTML elements based on the element name.

Syntax:

comment: /* */

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

Example:

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

CSS properties for colors

```
p {
        color: white;
        background-color: blue;
}
```

This paragraph uses the style above.

property	description
color	color of the element's text
background-color	color that will appear behind the element

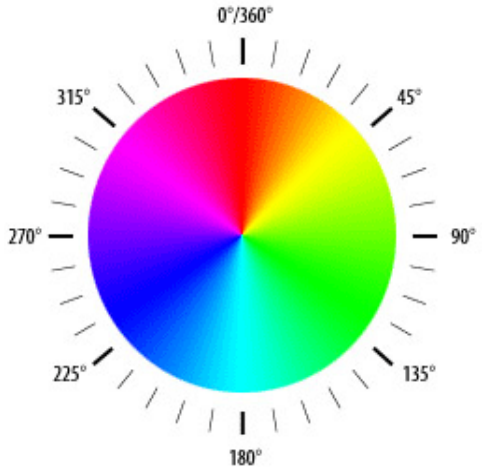
Specifying colors

- **Color names**: aqua, black, blue, fuchsia, gray, green, lime, maroon, navy, olive, purple, red, silver, teal, white, yellow
- **RGB & RGBA codes**: red, green, and blue values from 0 to 255
- **HEX codes**: RGB values in base-16 from 00 (none) to FF (full)
- **HSL & HSLA codes:** HSL stands for hue, saturation, and lightness
- Hue is degree on color wheel (from 0 to 360) - 0 (or 360) is red, 120 is green, 240 is blue.

  Hsla demo https://codepen.io/kman/pen/KwapPZ

  Google css color picker

```
h1 { color: red; }
h2 { color: rgb(128, 0, 196); }
h3 { color: rgba(128, 0, 196, 0.5); }
h4 { color: #FF8800; }
h5 { color: #F80; }
h6 { color: hsla(120, 60%, 70%, 0.3); }
```



CSS properties for fonts

property	description	Values
font-family	which font will be used	serif or “Courier New”
font-size	how large the letters will be drawn	A unit value, percentage, or named value
font-style	used to enable/disable italic style	normal(default), italic, …
font-weight	used to enable/disable bold style	normal(default), bold, bolder,…
font	Sets all font properties	style weigh size family
Complete list of font properties		

CSS properties for fonts

```
h1{  /* which font will be used */
        font-family: Georgia;
}
h2 {  /* enclose multi-word font names in quotes */
        font-family: "Courier New";
}
h3 {  /* can specify multiple fonts from highest to lowest priority */
        font-family: Garamond, "Times New Roman", serif;
}
```

- If the first font is not found on the user's computer, the next is tried
- Placing a generic font name at the end of your font-family value ensures that every computer will use a valid font
- CSS generic font names: serif, sans-serif, cursive, fantasy, monospace
- Serifed fonts easier to read on printed pages, hard to read on computer screens

Size Units


- Units: pixels (**px**), point (**pt**), m-size (**em**), vw, vh
  - **px** specifies a number of pixels on the screen (1/96 of an inch)
  - **pt** specifies number of points, where a point is 1/72 of an inch on screen
  - **em** relative to the font-size of the parent element
  - **vw** Equal to 1% of the width of the viewport's initial containing block
  - **vh** Equal to 1% of the height of the viewport's initial containing block.

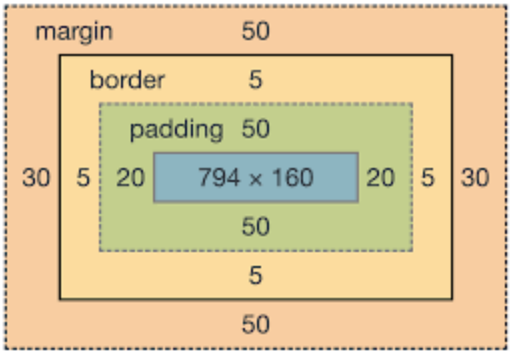
- Vague font sizes: xx-small, x-small, small, medium, large, x-large, xx-large, smaller, larger

- https://webflow.com/blog/how-and-why-to-use-vh-and-vw-in-webflow

CSS Box Model

Every HTML element is composed of:

- The actual element's content or **width/height**
- **Padding** between the content and the border
- **Border** around the element
- **Margin** between the border and other content



Total width = content width + L/R padding + L/R border + L/R margin
Total height = content height + T/B padding + T/B border + T/B margin

CSS properties for borders

```
h2 { border: 5px solid red; }
```

This is the best WAP course!

Property	Description
border	thickness/style/color of border on all 4 sides

- **thickness** (specified in px, pt, em, or thin, medium, thick)
- **style** (none, hidden, dotted , dashed , double , groove , inset , outset , ridge , solid)
- **color** (specified as seen previously for text and background colors)

More border properties

Property	Description
border-color, border-width, border-style	specific properties of border on all 4 sides
border-bottom, border-left, border- right, border-top	all properties of border on a particular side
border-bottom-color, border-bottom- style, border-bottom-width, border-left- color, border-left-style, border-left- width, border-right-color, border-right-style, border-right-width, border-top- color, border-top-style, border-top- width	properties of border on a particular side
Complete list of border properties	

Padding

- The padding shorthand property sets all the padding properties in one declaration. Padding shares the background color of the element. This property can have from one to four values:

```
padding:10px 5px 15px 20px; /* Top, right, bottom, left */
padding:10px 5px 15px; /* Top, right and left, bottom */
padding:10px 5px; /* Top and bottom, right and left */
padding:10px; /* All four paddings are 10px */
```

- padding-bottom, padding-left, padding-right, padding-top

```
h1 { padding: 20px; }
h2 {
    padding-left: 200px;
    padding-top: 30px;
}
```

Margin

- Margins are always transparent. This property can have from one to four values:

```
margin:10px 5px 15px 20px; /* Top, right, bottom, left */
margin:10px 5px 15px; /* Top, right and left, bottom */
margin:10px 5px; /* Top and bottom, right and left */
margin:10px; /* All four margins are 10px */
```

- margin-bottom, margin-left, margin-right, margin-top

```
h1 { margin: 20px; }
h2 {
    margin-left:200px;
    margin-top:30px;
}
```

CSS Selectors

HTML Element Selectors

`p {}` targets all paragraphs on the page <p>

Class Selectors

`.big{}` targets all elements with a class attribute of class="big"

ID Selectors

`#main{}` targets one element with id="main"

Attribute Selectors

`[lang=en]{}` targets all elements with an attribute of lang="en"

Pseudo-Classes/Elements

`a:hover{}` targets all anchor elements in hover state

`p::first-line {}` targets the first line of the text in all <p> elements

CSS Combinators

Multiple elements

`div, p {}` targets all and <p> elements

Descendent combinator (space)

`div p {}` targets all paragraphs that are inside a element

Direct child combinator

`div > p {}` targets all paragraphs that are direct children to a element

The HTML `class` and `id` attribute

- **`id` attribute** allows you to give a unique ID to any element on a page
  - Each ID must be unique; can only be used once in the page

- **`class` attribute** is used to group some elements and give a style to only that group
  - unlike an id, a class can be reused as much as you like on the page

class vs id examples

```
<p id="mission">Our mission is to provide the most</p>
<p class="special">See our spectacular spatula specials</p>
<p class="special shout">Today only, satisfaction guaranteed</p>
```

Our mission is to provide the most

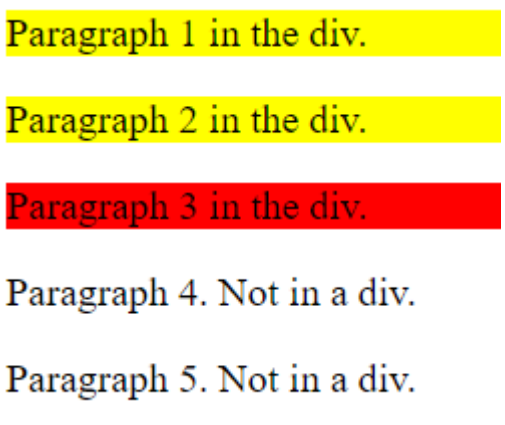
See our spectacular spatula specials

Today only, satisfaction guaranteed

```
#mission {
        font-style: italic;
        color: #000000;
}

.special {
       /* any element with class="special" */
        background-color: yellow;
        font-weight: bold;
}

p.shout {
        /* only p elements with class="shout" */
        color: red;
        font-family: cursive;
}
```

CSS Combinators selectors

```
<div>
    <p>Paragraph 1 in the div.</p>
    <p>Paragraph 2 in the div.</p>
    <section>
        <p>Paragraph 3 in the div.</p>
    </section>
</div>

<p>Paragraph 4. Not in a div.</p>
<p>Paragraph 5. Not in a div.</p>
```




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

div>p {
    background-color: yellow;
}
```

Inheriting styles

- Styles get inherited from containing elements
- **Not all properties are inherited** (notice link's color below)
  - E.g., margin, border,…

```
body {
  font-family: sans-serif;
  background-color: pink;
}
p {
  color: green;
}
a {
  text-decoration: underline;
}
h2 {
  font-weight: bold;
  text-align: center;
}
```

CS472 Web Programming

This course provides a systematic introduction to programming interactive and dynamic web applications.

Styles that Conflict

```
/* select multiple elements separated by commas */
p, h1, h2 {
  color: green;
  background-color: grey;
}
/* when two styles set conflicting values for the same
property, the latter style takes precedence */
h2 {
  background-color: blue;
}
<p> This paragraph will use background color grey! </p>
<h2> This heading will use background color blue! </h2>
```

Override Rules

```
<p class="RedColor BlueColor">
  Lorem Ipsum
</p>
```

```
#YelloColor {
  color: yellow;
}
.BlueColor {
  color: blue;
}
.RedColor {
  color: red;
}
```

Lorem Ipsum

Style Specificity

- When multiple styles apply to an element and have the same origin precedence.
- The most specific one applies. If they have the same specificity, then the later one will be used.

```
<aside>
     <p><em id="recent" class="awesome">Which awesome color?</em></p>
</aside>
```

```
aside {color: gray;}
p {color: green;}
em{color: yellow;}
.awesome {color: blue;}
em.awesome {color: red;}
em#recent.awesome {color: pink;}
#recent {color: black;}
```

CSS Specificity

When multiple styles apply to an element, the most specific one applies. If they have the same specificity, then the latter one will be used. **Priority** (from highest to lowest) and **Scores**:

1. Inline Styles `<div style="color: blue;"></div>`: `1,0,0,0`
2. ID Selectors `#header { color: green; }`: `0,1,0,0`
3. Class Selectors `.menu { color: red; }`: `0,0,1,0`

   Attribute Selectors `[type="text"] { color: black; }`: `0,0,1,0`

   Pseudo-Element `::first-letter { color: blue; }`: `0,0,1,0`
4. Pseudo-Classes `:hover { color: purple; }`: `0,0,0,1`

   Element Type Selectors `p { color: orange; }`: `0,0,0,1`
5. `Universal selector: 0`

When you use the `!important` rule, it will override the specificity rules.

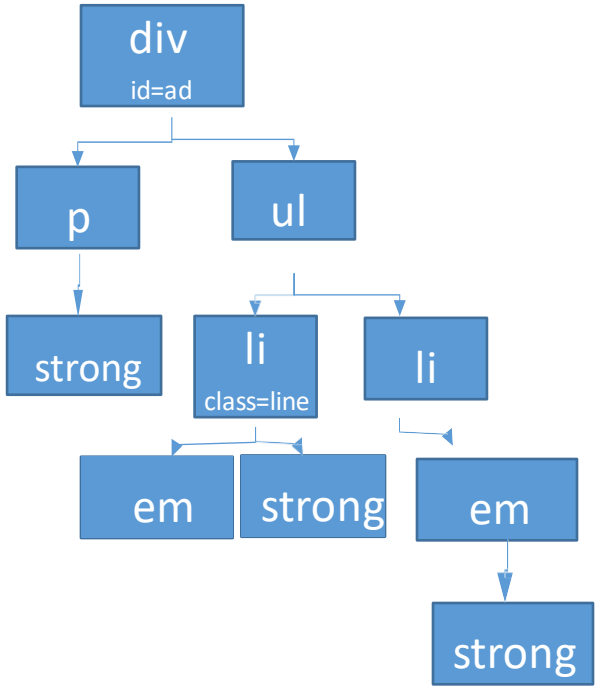
Specificity and Conflicts

- Specificity- decide which one should win when two or more rules conflict.
- Rules: each rule's overall selector is given a score based upon approximately the following rules.The rule with the highest score wins if there's a conflict.
  - Any HTML element mentioned in the rule scores 1 point
  - Any class mentioned in the rule scores 10 points
  - Any ID mentioned in the rule scores 100 points

- Examples:
  - p.banner - 11
  - div.box > p - 12
  - body #logo .box p.banner - 122

Example

```
<div id="ad">
  <p>Shop at <strong>Hardwick's Hardware</strong></p>
  <ul>
    <li class="line">
      <em>The </em>
      <strong>best</strong>
      prices!
    </li>
    <li>
      <em>
        <strong>Act while supplies last!</strong>
      </em>
    </li>
  </ul>
</div>
```




```
ul > li { background-color: blue; }
li strong { color: red; }
li > strong { color: green; }
#ad li.line strong { text-decoration: underline; }
```

pseudo-classes
pseudo-elements

- A **pseudo-class** is used to define a special state of an element
  - Style an element when a user mouse's over it
  - Style visited and unvisited links differently
  - Style an element when it gets focus

- A CSS **pseudo-element** is used to style specified parts of an element
  - Style the first letter, or line, of an element
    - ::first-line, ::first-letter
  - Insert content (pseudo element) before, or after, the content of an element
    - ::before, ::after

```
selector:pseudo-class { property:value; }

selector::pseudo-element { property:value; }
```

CSS pseudo-classes pseudo-elements

class	description
:active	an activated or selected element
:focus	an element that has the keyboard focus
:hover	an element that has the mouse over it
:link	a link that has not been visited
:visited	a link that has already been visited
:nth-child(`expr`)  :first-child, :last-child	targets specific children of a given element
:not(`selector`) 	all elements that do not match the given CSS selector
::first-line 	the first line of text inside an element
::first-letter 	the first letter of text inside an element

Complete list

Examples **pseudo-classes**

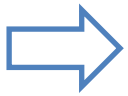
```css
/* unvisited link */
a:link { color: #FF0000; }

/* visited link */
a:visited { color: #00FF00; }

/* mouse over link */
a:hover { color: #FF00FF; }

/* click on a link */
a:active { color: #0000FF; }
```

More info and examples: Pseudo-classes and Pseudo-elements

Nesting Selectors

When the browser parses the nested selectors, it automatically adds whitespace between the selectors to create a new CSS selector rule.

```
parent-selector {
    /* parent rule style properties */
    child-selector {
        /* child rule style properties */
    }
}
```



```
parent-selector {
    /* parent rule style properties */
}

parent-selector child-selector {
    /* child rule style properties */
}
```

display

`inline`

do not start on a new line and only take up as much width as necessary.

- Cannot have width and height set explicitly.
- Margins and padding can only be applied horizontally, not vertically.

`block`

start on a new line and take up the full width available by default.

- Can have width and height set explicitly.
- Margins and padding are applied both vertically and horizontally.

`inline-block`

similar to inline elements in that they do not start on a new line, but they can have width and height set explicitly like block elements.

- Can have width and height set explicitly.
- Margins and padding are applied both vertically and horizontally.

Grid vs. Flexbox

CSS Grid creates a two-dimensional layout with rows and columns

CSS Flexbox to align elements on one dimension

Flexbox Layout

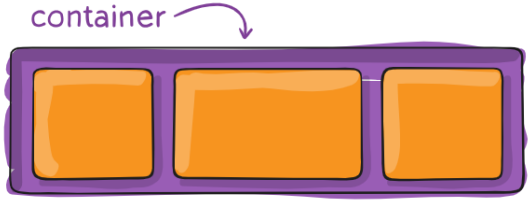
- Flexbox is for one dimensional layout (row or column).
- responsive layout without float or positioning
- set *display* property to *flex* on the containing element
- direct child elements are automatically flexible items

```
display: flex;
```

simple example

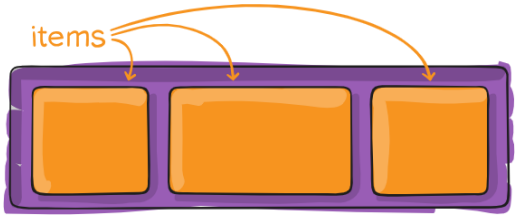
Flexbox properties

Properties for the Parent (flex container)



- display: flex;
- flex-direction: row | row-reverse | column | column-reverse;
- flex-wrap: nowrap | wrap | wrap-reverse;
- flex-flow: <'flex-direction'> || <'flex-wrap'>
- justify-content: flex-start | flex-end | center | space-between | space-around | space- evenly;
- align-items: stretch | flex-start | flex-end | center| baseline;
- align-content: flex-start | flex-end | center | space-between | space-around | stretch;

Properties for the Children (flex items)



- order: <integer>; */* default is 0 */*
- flex-grow: <number>; */* default 0 */*
- flex-shrink: <number>; */* default 1 */*
- flex-basis: <length> | auto; */* default auto */*
- flex: none | [<'flex-grow'> <'flex-shrink'>? || <'flex-basis'>]
- align-self: auto | flex-start | flex-end | center | baseline | stretch;

https://css-tricks.com/snippets/css/a-guide-to-flexbox/

Flexbox Demo

Home About us Products Shopping Contact us

```
<nav>
   <ul>
      <li><a href="#">Home</a></li>
      <li><a href="#">About us</a></li>
      <li><a href="#">Products</a></li>
      <li><a href="#">Shopping</a></li>
      <li><a href="#">Contact us</a></li>
   </ul>
</nav>
```

```
ul {
   display: flex;
   /* flex-direction: row; */
   flex-wrap: wrap;
   justify-content: flex-end;
      li {
        list-style-type: none;
        margin-right: 10px;
      }
}
```

Try Flexbox Playground

Grid Layout

- CSS Grid offers a grid-based layout system, with rows and columns, making it easier to design web pages without having to use floats and positioning.
- A Grid Layout must have a parent element with the display property set to grid
- Direct child element(s) of the grid container automatically becomes grid items.

Grid Demo

```
.container { display: grid;
             grid-template-columns: 150px auto auto auto;
             grid-template-rows: 50px auto 50px;
             grid-template-areas:
                 "header header header header"
                 "sidebar main main main"
                 "footer footer footer footer"; }

.cell-header { grid-area: header; }
.cell-sidebar { grid-area: sidebar; }
.cell-main { grid-area: main; }
.cell-footer { grid-area: footer; }
```


```
<div class="container">
    <div class="cell-header">header</div>
    <div class="cell-sidebar">sidebar</div>
    <div class="cell-main">main</div>
    <div class="cell-footer">footer</div>
</div>
```


good example and exercise https://www.w3schools.com/css/css_templates.asp

CSS Frameworks

Because CSS layout is so tricky, there are CSS frameworks out there to help make it easier. Here are a few if you want to check them out. Using a framework is only a good idea if the framework really does what you need your site to do.
They're no replacement for knowing how CSS works.

- Blueprint
- Bootstrap
- Foundation
- SemanticUI
- Tailwind ...

CONNECTING THE PARTS OF KNOWLEDGE WITH THE WHOLENESS OF KNOWLEDGE

Changing Appearances

1. How a page is displayed is affected by both the HTML and the CSS
2. Although every HTML tag has a default way of displaying, it can easily be changed with CSS and should never be the basis for using it. Instead use HTML tags based on meaning.

---

3. **Transcendental consciousness** is the field that underlies all differences.
4. **Impulses within the Transcendental field:** pure consciousness is a field of infinite possibilities that gives rise to the great diversity of the relative world, the same underlying content can appear as many expressions.
5. **Wholeness moving within itself:** In Unity Consciousness, one experiences that this unbounded diversity is nothing but the self.