CSS: Cascading Style Sheets

Lecture 13
Evolution of CSS

- MIME type: text/css
- CSS 1 ('96): early recognition of value
- CSS 2 ('98): improvements in language
  - Adding media types (screen vs print)
  - Inconsistent support by browsers
- CSS 2.1 ('11)
  - In practice since '04
  - Took forever to standardize
- CSS 3
  - Breaks standard into many (50?) modules
  - Various modules already adopted & supported
Key Idea

- Separate content and style
  - Different languages (syntax): HTML vs CSS
  - Different documents

- Goal: Single-point-of-control-over-change
  - Change font of every word in paragraph?
  - Change font of every `<em>` element in document?
  - Change font of every `<em>` element in every document on a site?
  - Change font of every `<em>` element which is part of instructions, but not finalized, on site?
CSS Syntax

- CSS is **declarative** (not **procedural**)
  - Describe a thing, not how to do compute it
  - Example: RE matching
- CSS = list of **rules** (order can matter)
- Rule = a location & the **style** to use there
- Basic syntax of a rule
  ```
  selector {
    property1: style1;
    property2: style2;
    ...
  } /*comments always help*/
  ```
Example CSS

```css
h2 {
    /* draconian OSU visual identity */
    color: darkred;
    background: gray;
    /* additional gratuitous styling */
    font-style: italic;
}
```
Available Properties (Styles)

- Background
  background-color, background-image

- Text, font
  line-height, text-align
  font-size, font-style

- Border, margin, padding
  border-left-width, border-bottom-color

- Positioning
  clear, display, float

- Dimension

- List, table
  list-style-type
    border-collapse, caption-side

- Generated content and other fancy stuff
Shorthand Properties

- Example: Margins have 4 sides
  ```
  margin-top: 3px;
  margin-right: 5px;
  margin-bottom: 7px;
  margin-left: 9px;
  ```
- Shorthand property: margin
  ```
  margin: 3px 5px 7px 9px; /*TRBL*/
  margin: 7px 9px; /*TB sides*/
  margin: 2px 6px 8px; /*T sides B*/
  ```
- Mnemonic: always "TRouBLe"
  - Missing values filled in with provided value(s)
- Other shorthand properties:
  - Border-width, padding, font, border, background...
Including CSS: Mechanics

- Embed directly in element
  `<p style="color:red;background:gray">`

- Place in style element in head
  `<head>
    <style media="screen" type="text/css">
      p {color:red; background:gray;}
    </style>
  </head>`

- Link to separate CSS file in head
  `<head>
    <link type="text/css" rel="stylesheet" href="3901Style.css" media="screen" />
  </head>`
Example CSS

```css
h2 {
    color: darkred;
    background: gray;
    font-style: italic;
}

em {
    font-style: normal;
    font-weight: bold;
}
```
Tree (Rooted at Body)
Tree (sans Attributes)
Tree (sans Attributes)
Selectors Applied to Tree

```
body
  ├── h1
  │    └── h2
  │         ├── p
  │         │    ├── a
  │         │    │    └── em
  │         │    └── img
  │         └── h2
  │              └── p
  │                  └── em
  │                          └── q
  └── h2 {...}
```
Selectors Applied to Tree

codepen.io/cse3901/pen/eVdMXR
Multiple Selectors

h1 {
    color: darkred;
    background: gray;
    font-style: italic;
    border-bottom-style: solid;
}

h2 {
    color: darkred;
    background: gray;
    font-style: italic;
}

Multiple Selectors: SPOCOC

h1, h2 {
  color: darkred;
  background: gray;
  font-style: italic;
}

h1 {
  border-bottom-style: solid;
}

codepen.io/cse3901/pen/eVdMXR
Inheritance for SPOCOC

- A child inherits many properties from parent by default
  - Font weight, color, family, etc
  - Can be overridden in child
- Set global styles in root
  ```
  body {
    font-family: sans-serif;
  }
  ```
  - Contrast this with having to set property in all possible elements!
- Generally, text properties (eg color) are inherited, box-related (eg border) are not
Example Inheritance

body {
    font-family: sans-serif;
    background: lightgray;
}

h2 {
    color: darkred;
    background: gray; /*new backgrnd*/
    font-style: italic;
    /*inherits font family*/
}

Inherited Properties

All nodes are sans-serif
Most nodes have light gray background

codepen.io/cse3901/pen/eVdMXR
Demo: FF Dev. Inspector
Layout: The Box Model

- Both block & inline
  - Minor differences
- Border appearance
  - Style, width, color, radius
- Margins & padding
  - Transparent
  - 4 independent sides
- Padding is *part* of it
  - *Content* background shows through
- Margins gives space
  - Some adjacent margins "collapse"
The Box Model As Layers

And the Lord spake, saying, "First shalt thou take out the Holy Pin. Then shalt thou count to three, no more, no less. Three shall be the number thou shalt count, and the number of the counting shall be three. Four shalt thou not count, neither count thou two, excepting that thou then proceed to three. Five is right out. Once the number three, being the third number, be reached, then loppeth thou the Holy Pin, Hand Grenade of Antioch towards thy foe, who, being naughty in my sight, shall snuff it.

http://geek.focalcurve.com/crashcourse-part2/
Examples
Box Sizing

\[
p \{ 
  \text{margin: 10px 100px 10px 10px;}
  \text{border-width: 5px 1px 5px;}
  \text{width: 200px;}
  \text{padding: 2px;}
\}
\]

- Total width = ?
- CSS3 adds box-sizing
  - content-box (width sizes content only)
  - border-box (width includes border & padding)
Collapsing Vertical Margins

Content1

Content2

Content1

Content2
Collapsing Nested Margins

Content

Content

Content
Preventing Margin Collapse

padding: 1px
Demo: FF Dev. Inspector, Box
Inheritance and Box Sizing

- Generally, text properties (eg color) are inherited, box-related (eg border) are not.
- (Content) width set by parent, child "fits" inside
  - Relative, absolute
- (Content) height set by child, parent "fits" around
  - Relative, absolute
- Parent and child's (vertical) margins collapse (if they touch)
Summary

- CSS separates style from structure
  - Syntax: Rules with selectors, properties
  - Link to CSS file from HTML document
- Selectors for picking elements in tree
- Box Model
  - Content, padding, border, margin
  - Margins can collapse when overlapping
- Inheritance
  - Parent passes (font) properties to child
  - Box-related properties aren't inherited