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*/
  ```

- Other shorthand properties:
  - Border-width, padding, font, border, background...
Including CSS: Mechanics

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

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

- Link to separate CSS file in head
  ```html
  <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**
    - **img**
  - **h2**
    - **em**
    - **q**
  - **em** {...}
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;
}
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

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

Content

Content

Content

Content

Content

Content
Box Sizing

```css
p {
    margin: 10px 100px 10px 10px;
    border-width: 5px 1px 5px;
    width: 200px;
    padding: 2px;
}
```

- Total width = ?
- CSS3 adds box-sizing
  - content-box (width sizes content only)
  - border-box (width includes border & padding)
Box Sizing

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  - content-box (width sizes content only)
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Collapsing Vertical Margins

Content1

Content2

Content1

Content2
Collapsing Nested Margins

Content

Content

Content
Preventing Margin Collapse

Example diagram:

1. Original content with no padding:
   - Content

2. Content with padding of 1px:
   - Content
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-related properties are inherited, box-related aren't (eg border)
Example Cascade

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

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

All nodes are sans-serif
Most nodes have light gray background
Demo: FF Dev. Inspector, Box