Web Site Construction II:

CSS for Style

David Gerbing
School of Business Administration
Portland State University
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## Typeface Conventions

<table>
<thead>
<tr>
<th>Typeface</th>
<th>Indicates …</th>
</tr>
</thead>
<tbody>
<tr>
<td>literal</td>
<td>a literal computer keyword, entered exactly as shown</td>
</tr>
<tr>
<td>example</td>
<td>a specific example of a word or phrase the user is free to choose</td>
</tr>
<tr>
<td>choice</td>
<td>the name of the attribute for which the user is free to choose his or her own word or phrase</td>
</tr>
</tbody>
</table>

Consider the following actual code,

```html
<img src="images/jacket.jpg" alt="jacket">.
```

Enter the `<img src=""` exactly as shown. Similarly for the `alt="` and `">`. The phrase `images/jacket.jpg` is based on names supplied by the user, in this case a directory called “images” and a file within that directory called “jacket.jpg”.

In contrast to the actual code displayed above, the more general definition displays as

```html
<img src="name" alt="description" />
```

Here the user specifies his or her chosen name, such as `images/jacket.jpg` from the above example code.
This section shows how to specify the display of a document’s with CSS. Design elements include the appearance of a structural element, such as blue paragraph text, as well as the position of a structural element, such as a navigation menu placed in the left-hand margin.
Cascading Style Sheets (CSS)

Traditional HTML, strictly defined, grows obsolete, replaced by two technologies: HTML5 mark-up language for document structure and cascading style sheets (CSS) for document design. This distinction between content and display splits web site construction into two different tasks that in large organizations typically correspond to two different groups of people. Those responsible for the content of the site need not be concerned much, if at all, with mark-up. CSS style rules provide for the site’s design by specifying how the marked-up elements display.

Similar to the role of paragraph formats when using a word processor, CSS defines the rules that specify the style of the web page – distinct from the content of the web page.

**Cascading style sheet (CSS) style rules specify the display of each structured element on a web page.**

The display of any of the structural elements of a web page, such as for headings at different levels, the primary text within paragraphs, and so on, generally differs for different web sites. Each browser provides a default display for the content of each element. Each browser automatically interprets, for example, a `<p>` as the beginning of a paragraph and then displays accordingly, such as with a blank line at the beginning of the paragraph displayed with black text. CSS provides the freedom for the web designer to display his or her chosen design.

The result of adding CSS style rules to the initial HTML structured mark-up is that two sources, generally represented by at least two distinct files, contribute to the final display rendered by the browser. One input file is the HTML and the other input file consists of the CSS.

Figure 1. More complete specification of input to, and output from, a web browser.
CSS Properties

CSS specifies the display of a document with a set of specific display properties and their associated values. The format of each property specification is

`property: value;`

For example, the color property specifies the color of the displayed text. To display text in blue, specify

`color: blue;`

The pattern is always the same: specify the property name followed by a colon, and then specify the specific value followed by a semicolon.

Two different types of rules style a document. The appearance rules specify aspects such as the color of the element’s background, the size of the element’s font, and the choice of the font. The positioning rules specify where on the screen the element displays, such as centering a paragraph. Examples of both appear below. All the CSS properties are described on the official World Wide Web consortium web’s site at schools.w3.com.

<table>
<thead>
<tr>
<th>Property</th>
<th>Example value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>color</td>
<td>blue</td>
</tr>
<tr>
<td>background-color</td>
<td>rgb(130,20,20)</td>
</tr>
<tr>
<td>background-image</td>
<td>url('images/c.gif')</td>
</tr>
<tr>
<td>font-size</td>
<td>1.2em</td>
</tr>
<tr>
<td>font-weight</td>
<td>bold</td>
</tr>
<tr>
<td>font-style</td>
<td>italic</td>
</tr>
<tr>
<td>font-family</td>
<td>arial, helvetica</td>
</tr>
<tr>
<td>border</td>
<td>1px solid red</td>
</tr>
<tr>
<td>list-style-type</td>
<td>none</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Example value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>margin</td>
<td>1em .5em 1em .5em</td>
</tr>
<tr>
<td>margin-top</td>
<td>1em</td>
</tr>
<tr>
<td>padding-right</td>
<td>.5em</td>
</tr>
<tr>
<td>text-align</td>
<td>center</td>
</tr>
<tr>
<td>float</td>
<td>left</td>
</tr>
<tr>
<td>width</td>
<td>7em</td>
</tr>
</tbody>
</table>

Under the browser’s View menu the user can specify the baseline display height for text. Choosing a value of `large` makes all the text larger than does a value of `small`. An `em` is the width of the letter m for the specified user-chosen baseline.
height. Text properties set with ems scale larger or smaller according to this baseline. Most web designers prefer ems for text and most other design elements to pixels (px) because values set in pixels are absolute sizes for a given monitor and so do not scale according to the user-selected baseline. Pixels generally refer only to graphics, which naturally exist in fixed pixel sizes.

Specifying a font size of 1.5 times larger than normal with the following CSS style rule is an example of an appearance rule:

```css
font-size: 1.5em;
```

The specification of a top margin of 2em with the CSS style rule,

```css
margin-top: 2em;
```

affects the positioning of the element on the screen. A top margin of 5em for a paragraph would position the paragraph further down the screen than a top margin of only 2em.

### CSS Selectors

How are CSS style rules attached to specific elements of the document? For example, how is a browser instructed to display all, some or exactly one paragraph with blue text? The key is to organize a set of properties into a style rule and then specify the elements of the web page to which the style rule applies. Every CSS style rule consists of a selector and one or more specified properties.

A style rule selector defines the element(s) of the document to which the style rule applies.

The format of a style rule is

```css
selector { property-value combinations }
```

There can be as many property-value combinations as desired for each style rule.

Style rules can appear in different places, but the best place is usually an external file. A discussion of the different types of selectors with specific examples follows.

#### Element Type Selector

A selector that is also a mark-up tag is an element type selector. Consider the CSS style rule that specifies that paragraphs display with blue text in italics with a top margin of 2em. The tag element for a paragraph, p, is the selector, as in,

```css
p { margin-top: 2em; color: blue; font-style: italic; }
```
The three properties specified for this selector are margin-top, color, and font-style, with respective values of 2em, blue, and italic. Braces {} enclose the style rule.

A style definition can be optionally written in a more readable form by placing each property-value on its own line.

```css
p {
  margin-top: 2em;
  color: blue;
  font-style: italic;
}
```

As with HTML, multiple blank spaces in a CSS style definition have the same meaning as a single blank space, so they can be inserted wherever a single space can occur.

This style rule redefines the appearance from the browser’s default format for all paragraphs in the web page, not otherwise modified. Other properties of the browser’s default format for paragraph remain, such as a leading blank line, no background color and no border. But the default top margin, default color, and default font style are all specifically overwritten by this CSS style rule.

**Pseudo-Class Selector**

Another selector type is the pseudo-class selector, which as currently defined and implemented primarily applies to the styling of hypertext links specified with the anchor tag, a. A pseudo-class refers to a specific state depending on how the user interacts with the mouse on the web page. Pseudo-class selectors include hover, link, and visited, and are separated from the tag name with a colon.

An example of the hover pseudo-class follows,

```css
a:hover { color: red; background-color: yellow; }
```

In this example, hovering the mouse over a hypertext link displays the link content in red with a yellow background. The user activates this pseudo-class selector only when hovering the mouse over the corresponding link.

The link pseudo-class applies to the appearance of a link when the mouse is not hovering over it and it has not been visited recently, such as,

```css
a:link { color: black; background-color: transparent; }
```

In this example, the link content displays in black with no background.

A single style rule can also be applied to more than one selector by separating the selectors with commas. Consider the following style rule,
In this situation, both unvisited and visited links are displayed with the same style.

**External Style Sheets**

The preferred location for most, if not all, of the style rules is in a separate text file, an external style sheet. Usually this external file has the file type of .css and a full name of something like `styles.css`. For example, consider an external style sheet that consists of the following three style rules.

```css
p { margin-top: 2em; color: blue; font-style: italic; }
a:link, a:visited { color: black; font-style: italic; background-color: transparent; }
a:hover { color: red; background-color: yellow; }
```

An HTML file accesses these style rules by referencing this .css file with a link tag in its head:

```html
<head>
<title>A Real Web Page</title>
<meta http-equiv="Content-type" content="text/html; charset=iso-8859-1" />
<link rel="stylesheet" type="text/css" href="styles.css" />
</head>
```

The general format of the link statement is,

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

where `name` is the name of the file that contains the specified external style sheet.

The style rules in the CSS file apply to any HTML file that references the CSS file with the link tag. Thus external style sheets provide a powerful styling mechanism for defining the appearance of an entire web site.

Linking the HTML files in a web site to the same external CSS style sheet(s) maintains an easily modifiable and consistent set of styles across the entire site.

Simply changing a single style definition in a site’s primary external CSS style sheet changes this styling across the entire site. If the web designer wishes to have second-level headers displayed in red, then simply specify the corresponding style definition in one external style sheet. For a web site with 1000 web pages that all reference the same style sheet, all 1000 pages display second-level headers in red based on a single CSS style rule specified in a single external style sheet.
ID Selector

In many situations only a single HTML element or div block is styled with a specified style rule. For example, perhaps most second-level headings are red, but just one such heading on a web page should be displayed in blue. How can the styling of just this one heading be specified?

The preferred styling of a single element is with the id selector. The designer chooses the name for the id selector, and then defines its properties. The specification of an id selector from a style sheet includes the # sign in front of the selector’s name. An example is the id selector named pizzazz that here specifies a text color of blue:

```css
#pizzazz { color: blue; }
```

In the body of the HTML file, apply the styling of the id selector by adding an id="name" attribute to the h2 tag.

```html
<h2 id="pizzazz">My heading</h2>
```

A particularly useful application of an id selector is to attach the selector to an element that contains other elements, such as a table or div,

```html
<div id="mydivstyle">
  my content
</div>
```

All elements within that container are then styled with the unique attributes specified by the id selector. If the style rule for an id selector specifies a text color of blue, and that id selector is applied to an entire div block, then all paragraphs, lists, headings, etc. within that div block will also be styled with a blue text unless otherwise specified.

To illustrate, consider a navigation menu that runs down the left side of the web page. This menu presents a list of choices under the menu products and a list of choices under the menu locate. Clicking on any of these choices transports the user to another web page.

The HTML markup for this navigation menu follows. This markup adheres to the general dictum that HTML markup structures the content distinct from the styling accomplished by the CSS rules. In this example, the menu choices appear as unordered list items according to the <ul> tag. Each list item (i.e., menu choice) links to another web page. The menu titles appear as third-level headers. All menu choices within the div block are styled according to the id="leftmenu" selector.
An external CSS style sheet defines the leftmenu style as

```css
#leftmenu {
  width: 7em;
  font-family: Arial, Helvetica, sans-serif;
}
```

This pattern is quite general and powerful in the CSS styling of web pages. Entire blocks of content – such as a navigation menu, a center column, or a header – are set-off in div blocks. An unique id selector that specifies the styling for that section of the web page identifies each div block. This concept becomes even more powerful with the concept of a descendental selector, described next.

### More Examples of CSS Style Rules

```
styles.css

body {
  background-color: rgb(220,220,220);
  color: black;
  font-size: 1.2em;
  font-family: Arial, Helvetica, sans-serif;
}

h1 { background-color: rgb(153,153,153); font-style: italic; line-height: 42px; }

.pizzazz { color: rgb(204,0,0); font-size: 1.5em; font-weight: 600;
           margin-top: 1em; margin-bottom: .5em;
}

.box { display: block; border: 2pt groove rgb(204,0,204);
       padding: 1em; margin: 1em;
}

a:link, a:visited { color: black; font-style: italic; background-color: transparent; }

a:hover { color: red; background-color: yellow; }
```
Example Web Page from HTML+CSS

HTML+CSS Input

```html
<!DOCTYPE html>
<html>
<head>
<title>A Real Web Page</title>
<meta charset="utf-8" />
<link rel="stylesheet" type="text/css" href="styles.css" />
</head>
<body>
<h1>Wow What a Web Page!!!</h1>
<p class="pizzazz">Hi. This is an example web page. First let’s look at some graphics. Here comes one now.</p>
<img src="images/LogoColorW.gif" alt="logo"/>
<p class="box">Here is a <a href="http://www.gerbing.com/">link</a>. And here is more text. This is really quite fun. Not a particularly pretty web page, but not bad to show how it is done.</p>
</body>
</html>
```

The only distinction between this HTML input and the previous example is the use of CSS. The link statement, the fourth line of the <head>, links the styles.css style sheet to this HTML file. The two element type selectors in styles.css redefine the styling of the corresponding body and h1 elements. Two style rules with class selectors are also explicitly referenced: pizzazz and box. The two pseudo-class styles from the style sheet styles.css, the link styles a:link and a:hover, implicitly reference the styling of the hypertext link called link in this HTML file.
The first line of this output results from the pizzazz style. The last paragraph invokes the box style defined in the external style sheet, styles.css, which results in a box drawn around the entire paragraph. One word in this boxed paragraph, “more”, also formats according to the pizzazz style.

The last line of this web page contains an anchor link to another web page at a different web site, the word “link” in this example. In a CSS style sheet, the a:link style specifies the usual format of a hypertext link. The specific a:link style rule defined in styles.css specifies italics and black for the standard link format, as shown in the preceding web page.

The a:hover pseudo-class style specifies the display of a link in the specific circumstance when the mouse hovers over the link. The a:hover style defined in styles.css specifies red and italics with a yellow background. The accompanying graphic illustrates this format (limited by the lack of color in this printout).

**CSS in Practice**

**Centering**

Another widely used positioning style centers content. To use a single style rule to center several different elements together, such as an image and an
accompanying paragraph, enclose the various elements within a common `<div>` block. The relevant HTML and then CSS follows.

**HTML**

```
<div id="mycontent">
    <img src="images/LogoColorW.gif" alt="logo" />
    <p>A cool logo.</p>
</div>
```

Invoke the accompanying CSS `text-align` style for `#mycontent` with the value of `center`.

**CSS**

```
#mycontent {
    text-align: center;
}
```

The result is that both the image and its caption are centered on the displayed web page.
ADDENDUMS

This section provides additional information on the use and construction of web sites.
III. Addendums

CSS Navigation Menu

**HTML Input**

```html
<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8"/>
  <title>Lists as navigation menu</title>
  <link rel="stylesheet" href="navmenu.css" type="text/css"/>
</head>
<body>
  <nav>
    <ul>
      <li><a href="#">Option 1</a></li>
      <li><a href="#">Option 2</a></li>
      <li><a href="#">Option 3</a></li>
      <li><a href="#">Option 4</a></li>
    </ul>
  </nav>
</body>
</html>
```

**CSS Input**

```css
nav {
  float: left;
  width: 7em;
  font-family: Arial, Helvetica, sans-serif;
}
nav ul {
  list-style: none;
  margin: 0 1em 1em 0;
  padding: 0;
}
nav li {
  border-bottom: 1px solid rgb(153,153,153);
}
nav li a:link, nav li a:visited {
  display: block;
  color: white;
  background-color: rgb(167,184,201);
  text-decoration: none;
  padding: .4em .5em .4em .5em;
  border-left: .8em solid rgb(177,143,160);
  border-right: .15em solid rgb(177,143,160);
}
nav li a:hover {
  color: white;
  background-color: rgb(177,143,160);
}
```
Browser Output

No Mouse Hover

Mouse Hovering over Option 2
Template for a CSS Three-Column Layout (with a Header and Footer)

**Layout by Section**

<table>
<thead>
<tr>
<th>Header h1</th>
<th>Left Column id=&quot;leftcol&quot;</th>
<th>Center Column id=&quot;centercol&quot;</th>
<th>Right Column id=&quot;rightcol&quot;</th>
<th>Footer id=&quot;footer&quot;</th>
</tr>
</thead>
</table>

**CSS**

```css
h1 {
  margin: .5em .5em .5em 0em;
  background-color: rgb(204,204,204);
}
#leftcol {
  float: left;
  width: 15em;
}
#rightcol {
  float: right;
  width: 15em;
}
#centercol {
  margin-top: 1em;
  margin-left: 16em;
  margin-right: 16em;
  background-color: rgb(204,204,204);
}
#footer {
  clear: both;
  text-align: center;
  margin: 2em 1em 2em 0;
  background-color: rgb(204,204,204);
}
```

**HTML**

```html
<h1>This is the header area</h1>

<div id="leftcol">
  <p style="margin-top: 0;">This column of the 3-column layout displays on the left side with the float:left property.</p>
</div>

<div id="rightcol">
  <p style="margin-top: 0;">This column of the 3-column layout displays on the right side with the float:right property. In the HTML file this section follows the left column section.</p>
</div>

<div id="centercol">
  <p>This center column appears last in the HTML file, after the content for the left and right columns. To leave room for the side columns, set the margins for this center column equal to the respective column widths plus allow room for additional spacing between the columns.</p>
</div>

<div id="footer">
  <p>This is the footer which lies beneath all three columns.</p>
</div>
```

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