ĐẠI HỌC BÁCH KHOA HÀ NỘI
VIỆN CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG

CSS

Content

Basic CSS

Advanced CSS

Basic CSS

Content vs. Presentation

- Most HTML tags define content type, independent of presentation.
  - exceptions? (e.g. …… for bold text and ….. for italicized text)

- Style sheets associate presentation formats with HTML elements.
  - CSS1: developed in 1996 by W3C
  - CSS2: released in 1998, but still not fully supported by all browsers
  - CSS3: specification still under development by the W3C, “completely backwards compatible with CSS2” (according to the W3C)

- The trend has been towards an increasing separation of the content of webpages from the presentation of them.

- Style sheets allow us to maintain this separation, which allows for easier maintenance of webpages, and for a consistent look across a collection of webpages.

Content vs. Presentation (cont.)

- Style sheets can be used to specify how tables should be rendered, how lists should be presented, what colors should be used on the webpage, what fonts should be used and how big/small they are, etc.

- HTML style sheets are known as *Cascading Style Sheets*, since can be defined at three different levels
    1. *inline* style sheets apply to the content of a single HTML element
    2. *document* style sheets apply to the whole BODY of a document
    3. *external* style sheets can be linked and applied to numerous documents, might also specify how things should be presented on screen or in print lower-level style sheets can override higher-level style sheets

- User-defined style sheets can also be used to override the specifications of the webpage designer. These might be used, say, to make text larger (e.g. for visually-impaired users).

Inline Style Sheets

```
<html>
<!-- CS443 page17.html  17.10.14 -->

<head>
  <title>Inline Style Sheets</title>
</head>

<body>
  <p style="font-family: Arial,sans-serif;
            text-align: right">This is a
  right-justified paragraph in a sans serif
  font (preferably Arial), with some
  <span style="color: green">green
text</span>.
  </p>

  <p>And <a style=" color: red;
                   text-decoration: none;
                   font-size: larger;"
           href="page01.html">here</a>
     is a formatted link.
  </p>
</body>
</html>
```

view page

- Using the `style` attribute, you can specify presentation style for a single HTML element
  - within tag, list sequence of property:value pairs separated by semi-colons

font-family:Courier,monospace
font-style:italic
font-weight:bold
font-size:12pt font-size:large font-size:larger

color:red color:#000080
background-color:white

text-decoration:underline
text-decoration:none
text-align:left text-align:center
text-align:right text-align:justify
vertical-align:top vertical-align:middle
vertical-align:bottom

text-indent:5em text-indent:0.2in

Inline Style Sheets (cont.)

```
<html>
<!-- CS443 page18.html  17.09.09 -->

<head>
  <title>Inline Style Sheets</title>
</head>

<body>
  <p>Here is an image
    <img src="VictoriaBldg.jpeg"
         alt="image of Victoria Building"
         style="margin-left:0.3in;
                margin-right:0.3in;
                vertical-align:middle;
                border-style:double;
                border-color:blue" />
    embedded in text.
  </p>

  <ol style="list-style-type:upper-alpha">
    <li> one thing</li>
    <li> or another</li>
    <ul style="list-style-type:square;
               whitespace:pre">
      <li> with  this</li>
      <li> or    that</li>
    </ul>
  </ol>
</body>
</html>
```

view page

- more style properties & values

margin-left:0.1in margin-right:5%
margin:3em
padding-top:0.1in padding-bottom:5%
padding:3em

border-width:thin border-width:thick
border-width:5
border-color:red
border-style:dashed border-style:dotted
border-style:double border-style:none

whitespace:pre

list-style-type:square
list-style-type:decimal
list-style-type:lower-alpha
list-style-type:upper-roman

Inline Style Sheets (cont.)

```
<html>
<!-- CS443 page19.html 17.10.14 -->

<head>
  <title> Inline Style Sheets </title>
</head>

<body>
  <table style="font-family:Arial,sans-serif">
    <caption style="color:red;
                    font-style:italic;
                    text-decoration:underline">
       Student data. </caption>
    <tr style="background-color:red">
      <th> name </th> <th> age </th>
    </tr>
    <tr>
      <td> Chris Smith </td> <td> 19 </td>
    </tr>
    <tr>
      <td> Pat Jones </td> <td> 20 </td>
    </tr>
    <tr>
      <td> Doogie Howser </td> <td> 9 </td>
    </tr>
</table>
</body>
</html>
```

view page

- style sheets can be applied to tables for interesting effects

Document Style Sheets

- Inline style sheets apply to individual elements in the page.
  - using inline style directives can lead to inconsistencies, as similar elements are formatted differently
    - e.g., we might like for all <h1> elements to be centered
  - inline definitions mix content & presentation
    - violates the general philosophy of HTML
- As a general rule, inline style sheet directives should be used as sparingly as pos
- Alternatively, document style sheets allow for a cleaner separation of content and presentation.
  - style definitions are placed in the <head> of the page (within STYLE tags)
  - can apply to all elements, or a subclass of elements, throughout the page sible.

Document Style Sheets

```
<html>
<!-- CS443 page20.html  17.10.14 -->

<head>
  <title>Document Style Sheets</title>
  <style type="text/css">
     h1 {color:blue;
         text-align:center}
     p.indented {text-indent:0.2in}
  </style>
</head>

<body>
  <h1> Centered Title </h1>

  <p class="indented">This paragraph will have
the first line indented, but subsequent lines
will be flush. </p>

  <p>This paragraph will not be indented.
  </p>

 <h1> The End </h1>

</body>
</html>
```

view page

- document style sheets ensure that similar elements are formatted similarly
  - can even define subclasses of elements and specify formatting

`p.indented` defines subclass of paragraphs
- inherits all defaults of <p>
- adds new features

to specify this newly defined class, place class="ID" attribute in tag

- note how "clean" the <body> element is

Document Style Sheets (cont.)

```
<html>
<!-- CS443 page21.html  17.10.14 -->

<head>
  <title> Inline Style Sheets </title>
 <style type="text/css">
     table { font-family: Arial,sans-serif }
     caption { color: red;
               font-style: italic;
               text-decoration: underline }
     th {background-color: red}
  </style>
</head>

<body>
  <table>
    <caption> Student data. </caption>
    <tr><th> name </th>          <th>
age</th></tr>
    <tr><td> Chris Smith </td>   <td> 19
</td></tr>
    <tr><td> Pat Jones </td>     <td> 20
</td></tr>
    <tr><td> Doogie Howser </td> <td> 9 </td></tr>
</table>
</body>
</html>
```

view page

- document style sheets are especially useful in formatting tables
- effectively separates content from presentation
  - what if you wanted to right-justify the column of numbers?
  - what if you changed your mind?

Pseudo-Elements

```
<html>
<!-- CS443 page23.html  17.10.14 -->

<head>
  <title>Title for Page</title>
  <style type="text/css">
      a {color : red;
         text-decoration : none;
         font-size : larger}
      a:visited {color : black}
      a:active {color : orange}
      a:hover {color : blue}
      p:first-letter {font-size : large;
              color : white;
              background-color : darkblue}
  </style>
</head>

<body>
  <p> Welcome to my Web page.  I am so
  happy you are here.
  </p>
  <p> Be sure to visit
  <a href="http://www.cnn.com" >CNN</a>
  for late-breaking news.
  </p>
</body>
</html>
```

view page

- pseudo-elements are used to address sub-parts of elements
  - can specify appearance of link in various states
    - `:visited` `:active` `:hover`
  - can specify format of first line in page or paragraph
    - `:first-line`
  - can specify format of first letter in page or paragraph
    - `:first-letter`

- *Danger :* changing the look of familiar elements is confusing
- *Careful :* current browsers do not support all CSS2 features

External Style Sheets

- modularity is key to the development and reuse of software
  - design/implement/test useful routines and classes
  - package and make available for reuse
  - saves in development cost & time
  - central libraries make it possible to make a single change and propagate the changes
- external style sheets place the style definitions in separate files
  - multiple pages can link to the same style sheet, consistent look across a site
  - possible to make a single change and propagate automatically
  - represents the ultimate in content/representation separation

Modularity & Style Sheets

```
<html>
<!-- CS443 page26.html 17.10.14 -->

<head>
  <title>Title for Page</title>
  <link rel="stylesheet"
        type="text/css"
        href="myStyle.css"
        title="myStyle" />
</head>

<body>
 <h1>Centered Title</h1>

 <p class="indented">This paragraph will
have the first line indented, but subsequent
lines will be flush.</p>

 <p>This paragraph will not be indented.
 </p>

 <h1>The End</h1>

</body>
</html>
```

view page

```
/* myStyle.css  CS443 02.09.05 */

h1 {color : blue; text-align : center}
p.indented {text-indent: 0.2in}
```

- Ideally, the developer(s) of a Web site would place all formatting options in an external style sheet.
- All Web pages link to that same style sheet for a uniform look.
  - simplifies Web pages since only need to specify structure/content tags
  - Note: no <style> tags are used in the external style sheet

and Tags

- Problem: font properties apply to whole elements, which are often too large
  - Solution: a new tag to define an element in the content of a larger element -
  - The default meaning of is to leave the content as it is (i.e. unchanged)

```
<p> Now is the <span> best time </span> ever! </p>
```

- Use to apply a document style sheet definition to its content

```
<style type = "text/css">
 .bigred {font-size: 24pt;
 font-family: Ariel; color: red}
 </style>
... ...
 <p> Now is the <span class="bigred">
     best time </span> ever!
 </p>
```

- The tag is similar to other HTML tags, they can be nested and they have id and class attributes

view page

- Another tag that is useful for style specifications:

Used to create document sections (or divisions) for which style can be specified
e.g., a section of five paragraphs for which you want some particular style

Web rules of thumb (ok, my rules of thumb…)

- HTML and CSS provide lots of neat features,

  but just because you can add a feature doesn't mean you should!

  don't add features that distract from the content of the page

  - use color & fonts sparingly and be careful how elements fit together
    - e.g, no purple text on a pink background, no weird fonts
    - e.g. I find bright white text on a black background difficult to read
    - Consider the needs of visually impaired users of your website!!
  - use images only where appropriate
    - e.g., bright background images can make text hard to read
    - e.g., the use of clickable images instead of standard HTML buttons or links can slow access
  - don't rely on window or font size for layout
    - e.g., font size may be adjusted by viewer, window constrained
  - don't be annoying
    - e.g., lots of pop-up windows, excessive advertising, silly music
  - break a large document into several smaller ones or provide a menu for navigation
  - stick to standard features and test as many browsers as possible (and versions of the same browser)
  - utilize style sheets to make changes easy & ensure consistency

Advaned CSS

Rounded Corners

- With the CSS border-radius property, you can give any element “rounded corners”.
  - Rounded corners for an element with a specified background color:

```
#rcorners1 {
  border-radius: 25px;
  background: #73AD21;
  padding: 20px;
  width: 200px;
  height: 150px;
}
```

Rounded Corners

- With the CSS border-radius property, you can give any element “rounded corners”.
  - Rounded corners for an element with a border:

```
#rcorners2 {
  border-radius: 25px;
  border: 2px solid #73AD21;
  padding: 20px;
  width: 200px;
  height: 150px;
}
```

Rounded Corners

- With the CSS border-radius property, you can give any element “rounded corners”.
  - Rounded corners for an element with a background image:

```
#rcorners3 {
  border-radius: 25px;
  background: url(paper.gif);
  background-position: left top;
  background-repeat: repeat;
  padding: 20px;
  width: 200px;
  height: 150px;
}
```

Rounded Corners

- With the CSS border-radius property, you can give any element “rounded corners”.
  - Rounded corners for an element with a background image:

```
#rcorners3 {
  border-radius: 25px;
  background: url(paper.gif);
  background-position: left top;
  background-repeat: repeat;
  padding: 20px;
  width: 200px;
  height: 150px;
}
```

Rounded Corners

- border-radius with multiple values

Shadows

- With CSS you can add shadow to text and to elements.
- Box Shadows: applies shadow to elements.

```
box-shadow: 5px 5px 3px 1px #999
```

- The first value is **the horizontal offset** — how far the shadow is nudged to the right (or left if it's negative)
- The second value is **the vertical offset** — how far the shadow is nudged downwards (or upwards if it's negative)
- The third value **is the blur radius** — the higher the value the less sharp the shadow. ("0" being absolutely sharp). This is optional — omitting it is equivalent of setting "0".
- The fourth value is **the spread distance** — the higher the value, the larger the shadow ("0" being the inherited size of the box). This is also optional — omitting it is equivalent of setting "0".
- The fifth value is a **color**. That's optional, too.

Shadows

- With CSS you can add shadow to text and to elements.
- Box Shadows: applies shadow to elements.

```
box-shadow: inset 0 0 7px 5px
#ddd;
```

- apply shadows to the inside of a box by adding “inset” to the list

Shadows

- Text Shadows: applies shadow to text.

```
text-shadow: -2px 2px 2px #999;
```

- The first value is the **horizontal offset**
- The second value is the **vertical offset**
- The third value is the **blur radius** (optional)
- The fourth value is the **color** (optional, although omitting this will make the shadow the same color as the text itself)

Universal, Child, and Adjacent Selectors

- Universal selectors: set global styles for a page, or as a descendant of a selector to set styles of everything within something.

```
* {
    margin: 0;
    padding: 0;
}
#contact * {
    display: block;
}
```

Example: set the margin and padding on everything in a page to zero and everything within an element with the ID “contact” to be displayed as a block

Universal, Child, and Adjacent Selectors

- Child selectors: A greater-than symbol (“>”) can be used to specify something that is a child of something else, that is, something immediately nested within something.

```
#genus_examples > li { border: 1px solid
red }
```

Example: set the border for all <li> child of element has id=“genus_examples”

Universal, Child, and Adjacent Selectors

- Adjacent selectors: A plus sign (“+”) is used to target an adjacent sibling of an element, essentially, something immediately following something.

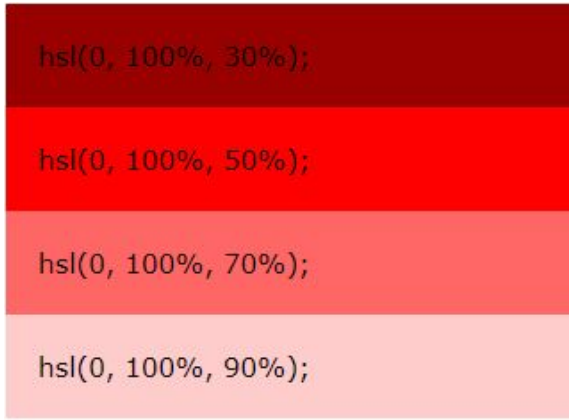
```
<h1>Clouded leopards</h1>
<p>Clouded leopards are cats that
belong to the genus Neofelis.</p>
<p>There are two extant species:
Neofelis nebulosa and Neofelis
diardi.</p>
```

```
h1 + p { font-weight: bold }
```

Only the first paragraph, that following the heading, will be made bold.

Advanced Colors

- We already know that colors can be defined by name, RGB, or hex values
- CSS 3 also allows you to paint away with HSL — hue, saturation, and lightness
- An HSL color value is specified with: hsl(hue, saturation, lightness).
  - Hue is a degree on the color wheel (from 0 to 360):
    - 0 (or 360) is red
    - 120 is green
    - 240 is blue
  - Saturation is a percentage value: 100% is the full color.
  - Lightness is also a percentage; 0% is dark (black) and 100% is white.



Advanced Colors

- HSLA

CSS Transitions

- Transitions allow you to easily animate parts of your design without the need for the likes of JavaScript
- CSS transitions allows you to change property values smoothly, over a given duration.

  - transition-property: which property (or properties) will transition.
  - transition-duration: how long the transition takes.
  - transition-timing-function: if the transition takes place at a constant speed or if it accelerates and decelerates.
  - transition-delay: how long to wait until the transition takes place.

Backgrounds: Multiples, Size, and Origin

- Multiples background: CSS3 allows you to apply multiple background images to a single box by simply putting image locations in a comma-separated list

```
background-image: url(this.jpg), url(that.gif),
url(theother.png);
```

Backgrounds: Multiples, Size, and Origin

- Background size: The background-size property allows you to stretch or compress a background image.
  - **auto**, which maintains the background image's original size and width/height ratio.
  - **lengths**, a width and a height
  - **percentages**, a width and a height
  - A **combination** of lengths, percentages, and auto
  - **contain**, which maintains the background image's original ratio and makes it as large as possible whilst fitting entirely within the box's background area.
  - **cover**, which maintains the background image's original ratio and makes it large enough to fill the entire background area, which may result in cropping of either the height or width.

Backgrounds: Multiples, Size, and Origin

- Background origin: specifies where the background image is positioned.
- The property takes three different values:
  - border-box - the background image starts from the upper left corner of the border
  - padding-box - (default) the background image starts from the upper left corner of the padding edge
  - content-box - the background image starts from the upper left corner of the content

Transformations

- CSS transforms allow you to move, rotate, scale, and skew elements.
  - The translate() method moves an element from its current position (according to the parameters given for the X-axis and the Y-axis).
  - The rotate() method rotates an element clockwise or counter-clockwise according to a given degree.
  - The scale() method increases or decreases the size of an element (according to the parameters given for the width and height).
  - The skew() method skews an element along the X and Y-axis by the given angles.
  - The matrix() method combines all the 2D transform methods into one.