Core Web Technologies
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Cascading Style Sheets
Agenda

- Specifying style sheet rules
- External and inline style specifications
- Creating new HTML elements through style sheet classes
- Specifying font and text properties
- Controlling foreground and background properties
- Netscape LAYERs
- Creating layers through style sheets
Benefits of Cascading Style Sheets

• Powerful and flexible way to specify the formatting of HTML elements
  – Can define font, size, background color, background image, margins, etc.

• Share style sheets across multiple documents or entire Web site

• Can specify a class definition for a style, effectively defining new HTML elements

• Rules are applied in a hierarchical manner (precedence rules)
Cascading Style Sheets Solve a Common Problem

• HTML tags were originally designed to define the content of a document. They were supposed to say "This is a header", "This is a paragraph", "This is a table", by using tags like <h1>, <p>, <table>, and so on. The layout of the document was supposed to be taken care of by the browser, without using any formatting tags.
  
  As the two major browsers - Netscape and IE - continued to add new HTML tags and attributes (like the <font> tag and the color attribute) to the original HTML specification, it became more and more difficult to create Web sites where the content of HTML documents was clearly separated from the document's presentation layout.

• To solve this problem, the World Wide Web Consortium (W3C) created STYLES in addition to HTML 4.0.
  
  Both Netscape 4.0 and Internet Explorer 4.0 support Cascading Style Sheets.
Cascading Style Sheets Solve a Common Problem

- Styles in HTML 4.0 define how HTML elements are displayed, just like the font tag and the color attribute in HTML 3.2.
- Styles are normally saved in files external to your HTML documents.
  - External style sheets enable you to change the appearance and layout of all the pages in your Web, just by editing a single CSS document.
- CSS is a breakthrough in Web design because it allows developers to control the style and layout of multiple Web pages all at once.
  - As a Web developer you can define a style for each HTML element and apply it to as many Web pages as you want. To make a global change, simply change the style, and all elements in the Web are updated automatically.
Cascading Style Sheets

- **CSS, Level 1 (1996)**
  - Concerned with applying simple styles to HTML elements
  - [http://www.w3.org/TR/REC-CSS1](http://www.w3.org/TR/REC-CSS1)

- **CSS, Level 2 (1998)**
  - Supports media-specific style sheets (visual browsers, aural devices, printers, braille devices)
  - [http://www.w3.org/TR/REC-CSS2](http://www.w3.org/TR/REC-CSS2)

- **CSS, Level 3 (draft 2001)**
  - Focused on modularization of the CSS specification
  - [http://www.w3.org/TR/css3-roadmap/](http://www.w3.org/TR/css3-roadmap/)

- **Note:**
  - CSS1 is supported by Netscape and Internet Explorer 4.x and above
Specifying Style Rules

• General form of rule

  selector { property: value }

  or

  selector { property1: value1;
            property2: value2;
            ...
            propertyN: valueN }

• Example

  H1 { text-align: center;
       color: blue }
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<html>
  <head>
    <title>New Advances in Physics</title>
  </head>
  <body>
    <h1>New Advances in Physics</h1>
    <h2>Turning Gold into Lead</h2>
    In a startling breakthrough, scientist B.O. "Gus" Fizzics has invented a <strong>practical</strong> technique for transmutation! For more details, please see <a href="give-us-your-gold.html">our transmutation thesis</a>.
    ...
  </body>
</html>
New Advances in Physics

Turning Gold into Lead

In a startling breakthrough, scientist B.O. "Gus" Fizzics has invented a practical technique for transmutation! For more details, please see our transmutation thesis.

Perpetual Inactivity Machine

In a radical approach that turned traditional attempts to develop perpetual motion machines on their heads, Prof. Fizzics has developed a verified bona-fide perpetual inaction machine. To purchase your own for only $99.00 (plus $43.29 shipping and handling), please see our order form.
Fizzics2.html, Example (with style sheet)

- Style information

```html
<HEAD>
  <TITLE>Document Title</TITLE>
  <STYLE TYPE="text/css">
    <!--
    BODY { background: URL(images/confetti-background.jpg) }
    H1 { text-align: center;
        font-family: Blackout }
    H2 { font-family: MeppDisplayShadow }
    STRONG { text-decoration: underline }
    -->
  </STYLE>
</HEAD>
```
In a startling breakthrough, scientist B.O. "Gus" Fizzics has invented a **practical**
technique for transmutation! For more details, please see [our transmutation thesis](#).

**Perpetual Inactivity Machine**

In a radical approach that turned traditional attempts to develop perpetual motion
machines on their heads, Prof. Fizzics has developed a verified bona-fide perpetual
**inaction** machine. To purchase your own for only $99.00 (plus $43.29 shipping and
handling), please see [our order form](#).
External Style Sheets

• Specify link to external style sheet in the HEAD section of the HTML document

  <LINK REL=STYLESHEET
       HREF="Sitestyle.css" // Absolute or relative link
       TYPE="text/css">

• Sitestyle.css

  /* Example of an external style sheet */

  H1 { text-align: center;
       font-family: Arial
  }

  H2 { color: #440000;
      text-align: center;
      font-family: Arial Black, Arial, Helvetica, sans-serif
  }

  ...

  ...
<html>
  <head>
    <link rel="stylesheet" type="text/css" href="ex2.css" />
  </head>
  <body>
    <h1>This is a header 1</h1>
    <hr>
    <p>You can see that the style sheet formats the text</p>
    <p><a href="http://www.microsoft.com" target="_blank">This is a link</a></p>
  </body>
</html>

ex2.css

body {background-color: tan}

h1 {color:maroon; font-size:20pt}

hr {color:navy}

p {font-size:11pt; margin-left: 15px}

a:link {color:green}

a:visited {color:yellow}

a:hover {color:black}

a:active {color:blue}
An internal style sheet should be used when a single document has a unique style. You define internal styles in the head section by using the <style> tag

```html
<head>
  <style type="text/css">
    hr {color: sienna}
    p {margin-left: 20px}
    body {background-image: url("images/back40.gif")}
  </style>
</head>
```

The browser will now read the style definitions, and format the document according to it.

Note: A browser normally ignores unknown tags. This means that an old browser that does not support styles, will ignore the <style> tag, but the content of the <style> tag will be displayed on the page. It is possible to prevent an old browser from displaying the content by hiding the style tag in an HTML comment element <!-- and -->
• Use the **STYLE attribute** defined for each HTML element to directly specify the style

• Example

...  

`<H1>New Advances in Physics</H1>`

`<P STYLE="margin-left: 0.5in;
     margin-right: 0.5in;
     font-style: italic">`

This paper gives the solution to three previously unsolved problems: turning lead into gold, antigravity, and a practical perpetual motion machine.

...
Cascading Order of Precedence

• Closer styles take precedence over distant styles
  – First, linked style sheets are applied
  – Then internal style sheets are applied
  – Finally applies inline styles

• Properties defined for a specific class of a tag take precedence over properties defined for a tag in general

• When multiple properties are defined for the same tag, the last property defined is applied
Defining Style Classes

• To define an *element style class* proceed the HTML element by a *period and class name*

```javascript
// Define an "abstract" paragraph type
P.abstract { margin-left: 0.5in;
            margin-right: 0.5in;
            font-style: italic }
```

• To use, supply the name of the style class in the **CLASS attribute** of the HTML element

```html
<H1>New Advances in Physics</H1>
<P CLASS="abstract">
This paper gives the solution to three previously unsolved problems: turning lead into gold, antigravity, and a practical perpetual motion machine.
```
Defining Style Classes

• To define a *global style class*, omit the element name

```javascript
// Style available to all elements
.blue { color: blue; font-weight: bold }
```

• To use, simply specify the style class in the `CLASS` attribute of the HTML element

```html
<H2 CLASS="blue">A Blue Heading</H2>

<SPAN CLASS="blue">this text is blue.</SPAN>
```

<!-- Apply to a section of text -->
This text is in the default color, but
<SPAN CLASS="blue">this text is blue.</SPAN>
Useful Font Properties

• **font-weight**
  – Relative weight (boldness) of font
  – *normal* | lighter | bold | bolder | 100 | 200 | ... | 900

    H1 { font-weight : 200 }
    H2 { font-weight : bolder }

• **font-style**
  – Font face type within a family
  – *normal* | italic | oblique

    P   { font-style : normal }
    TH  { font-style : italic }
Useful Font Properties, cont.

- **font-size**
  - Either relative or absolute size of font
  - `pt`, `pc`, `in`, `cm`, `mm` | `em`, `ex`, `px`, `%` |
    - `xx-large` | `x-large` | `large` | `medium` | `small` | `x-small` |
    - `xx-small` | `smaller` | `larger`

```css
STRONG { font-size: 150% }
P { font-size: 14pt }
P { font-size: xx-large }
```

- **font-family**
  - Typeface family for the font

```css
H1 { font-family: Arial }
```
<table>
<thead>
<tr>
<th>Rule</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>h2 {font-family:Arial; font-style:italic; color:blue}</td>
<td><em>Heading 2 in blue Arial italicised text</em></td>
</tr>
<tr>
<td>p {font-family:Arial; font-weight:bold; color:red}</td>
<td><em>A paragraph of bold Red text</em></td>
</tr>
<tr>
<td>p {background:yellow; font-family:Arial; color:red}</td>
<td><em>A paragraph of Red text on a yellow background</em></td>
</tr>
<tr>
<td>p {font-family:Arial; font-size:large; color:blue}</td>
<td><em>Large Blue Text</em></td>
</tr>
<tr>
<td>em {background:red; color:white; font-style:italic}</td>
<td><em>Text with emphasized</em></td>
</tr>
</tbody>
</table>
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<html>
  <head>
    <title>Camp Bear Claw</title>
    <link rel=stylesheet href="CampBearClaw.css" type="text/css">
  </head>
  <body>
    <h1>Camp Bear Claw</h1>
    We have the following activities:
    <h2 class="archery">Archery</h2>
    <h2 class="arts">Arts and Crafts</h2>
    <h2 class="horseback">Horseback Riding</h2>
    <h2 class="hiking">Hiking</h2>
    <h2 class="campfire">Campfire Song Times</h2>
    <h2 class="java">Java Programming</h2>
  </body>
</html>
```css
H1 { text-align: center;
    font-family: Funstuff }
H2.archery { font-family: ArcheryDisplay }
H2.arts { font-family: ClampettsDisplay }
H2.horseback { font-family: Rodeo }
H2.hiking { font-family: SnowtopCaps }
H2.campfire { font-family: Music Hall }
H2.java { font-family: Digiface }
```
Camp Bear Claw

We have the following activities:

ARCHERY

Arts and Crafts

HORSEBACK RIDING

HIKING

Campfire Song Times

JAVA PROGRAMMING
Useful Text Properties

• **text-decoration**
  – Describes text additions or “decorations” that are added to the text of an element
  – **none** | underline | overline | line-through | blink

  ```html
  p { text-decoration: underline }
  ```

• **vertical-align**
  – Determines how elements are positioned *vertically*
  – top | bottom | **baseline** | middle | sub | super | text-top | text-bottom | %

• **text-align**
  – Determines how paragraphs are positioned *horizontally*
  – **left** | right | center | justify
Useful Text Properties, cont.

• **text-indent**
  - Specifies the indentation of the *first* line of the paragraph
  - `+/- pt, pc, in, cm, mm | +/- em, ex, px, %`

    ```css
    P { text-indent: -25px } /* Hanging indent */
    ```

• **line-height**
  - Specifies the distance between two consecutive baselines in a paragraph
  - `normal | number | pt, pc, in, cm, mm | em, ex, px, %`

    ```css
    .double { line-height: 200% }
    .triple { line-height: 3 } /* 3x the font size */
    DIV { line-height: 1.5em }
    ```
An Open Letter to the IRS

April 1, 2001

William A. Bates
Macrosoft Corporation
Blumond, WA 12345

Dear Sirs,

I am writing to inform you that, due to financial difficulties, ...
Bates.css

P { margin-top: 5px }
P.rhead { text-align: right;
    margin-right: 0.5in;
    font-family: sans-serif }
P.lhead { font-family: sans-serif }
P.body { text-align: justify;
    text-indent: 0.5in }
P.foot { margin-left: 60%;
    line-height: 300% }
April 1, 2001

William A. Bates
Macrosoft Corporation
Blumond, WA 12345

Internal Revenue Service
Philadelphia, PA 67890

Dear Sirs,

I am writing to inform you that, due to financial difficulties, I will be unable to pay my taxes this year.

You see, my company has had reduced profits this year. In fact gross revenues have now dropped below the GDP of twelve foreign countries! Given this intolerable situation, I am sure you will understand.

Sincerely,

William A. Bates
Useful Foreground and Background Properties

• **color**
  
  Color of the text or foreground color
  
  - color-name | #RRGGBB | #RGB | rgb(rrr, ggg, bbb) | rgb(rrr%, ggg%, bbb%)

  ```
  P { color: blue }
  H1 { color: #00AABB }
  H3 { color: rgb(255, 0, 0) } /* red */
  ```

• **background-image**
  
  - none | url(filename)
  
  - Specifies an image to use as the background of region

  ```
  H2 { background-image: url(Bluedrop.gif); }
  ```
• **background-repeat**
  - Specifies how to tile the image in the region
  - `repeat` | `repeat-x` | `repeat-y` | `norepeat`

```html
BODY {
    background-image: url(Bluedot.gif);
    background-repeat: repeat-x;
}
```

• **background**
  - Lets you combine properties in a single entry

```html
P { background: url(wallpaper.jpg) repeat-x }
```
<!-- DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<html>
  <head>
    <title>Joe's Cabinets</title>
    <link rel=stylesheet href="Cabinets.css" type="text/css">
  </head>
  <body>
    <center>
        <table width=360 height=199>
          <tr><td align="center" class="banner">Joe's Cabinets</td></tr>
        </table>
    </center>
    <p>
    Welcome to Joe's Cabinets. We specialize in
    <ul>
      <li>Custom Cabinets</li>
      <li>Kitchen Remodeling</li>
      <!-- Etc -->
    </ul>
    <!-- Etc -->
  </body>
</html>
Cabinets.css

.ban...url(images/boards.jpg) repeat-x;
font-size: 50pt;
font-family: Arial Rounded MT Bold }
Cabinets.html, Result

Welcome to Joe's Cabinets. We specialize in

- Custom Cabinets
- Kitchen Remodeling
### Appendix, Length Units

<table>
<thead>
<tr>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cm</td>
<td>Centimeters (absolute unit)</td>
</tr>
<tr>
<td>em</td>
<td>The height of the current font (relative unit)</td>
</tr>
<tr>
<td>ex</td>
<td>The height of the letter “x” in the current font (relative unit)</td>
</tr>
<tr>
<td>in</td>
<td>Inches (absolute unit)</td>
</tr>
<tr>
<td>mm</td>
<td>Millimeters (absolute unit)</td>
</tr>
<tr>
<td>pc</td>
<td>Picas; 6 picas per inch; 12 points per pica (absolute unit)</td>
</tr>
<tr>
<td>pt</td>
<td>Points; 72 points per inch (absolute unit)</td>
</tr>
<tr>
<td>px</td>
<td>Pixels (relative unit)</td>
</tr>
</tbody>
</table>