



Cascading Style Sheets (CSS)

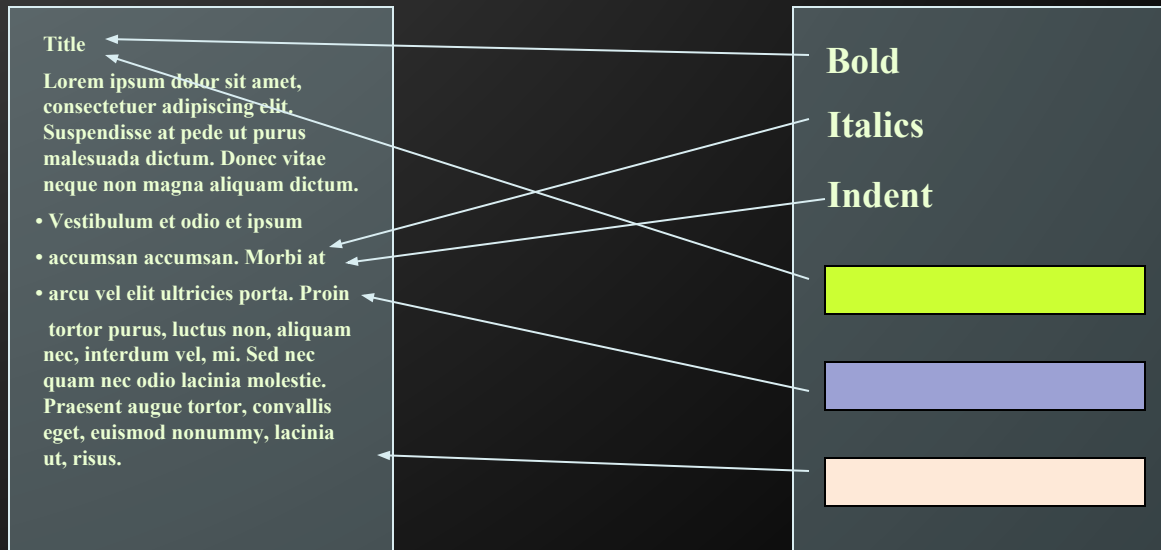
```
171 #content .article img.left.border {  
172     padding: 0 9px 9px 0;  
173     border-right: 1px dotted #999;  
174     border-bottom: 1px dotted #999; }  
175 #content .article blockquote {  
176     margin-left: 10px;  
177     padding-left: 10px;  
178     border-left: 3px solid #252525; }  
179 #content .article ul {  
180     padding-left: 1em;  
181     list-style-type: circle; }
```

CSS: A New Philosophy

◆ Separate content from presentation!

**Content
(HTML
document)**

**Presentation
(CSS Document)**



The Resulting Page

Title

Lorem ipsum dolor sit amet,
consectetur adipiscing elit.
Suspendisse at pede ut purus
malesuada dictum. Donec vitae neque
non magna aliquam dictum.

- *Vestibulum et odio et ipsum*
- *accumsan accumsan. Morbi at*
- *arcu vel elit ultricies porta. Proin*

Tortor purus, luctus non, aliquam nec,
interdum vel, mi. Sed nec quam nec
odio lacinia molestie. Praesent augue
tortor, convallis eget, euismod
nonummy, lacinia ut, risus.



CSS Intro

Styling with Cascading Stylesheets

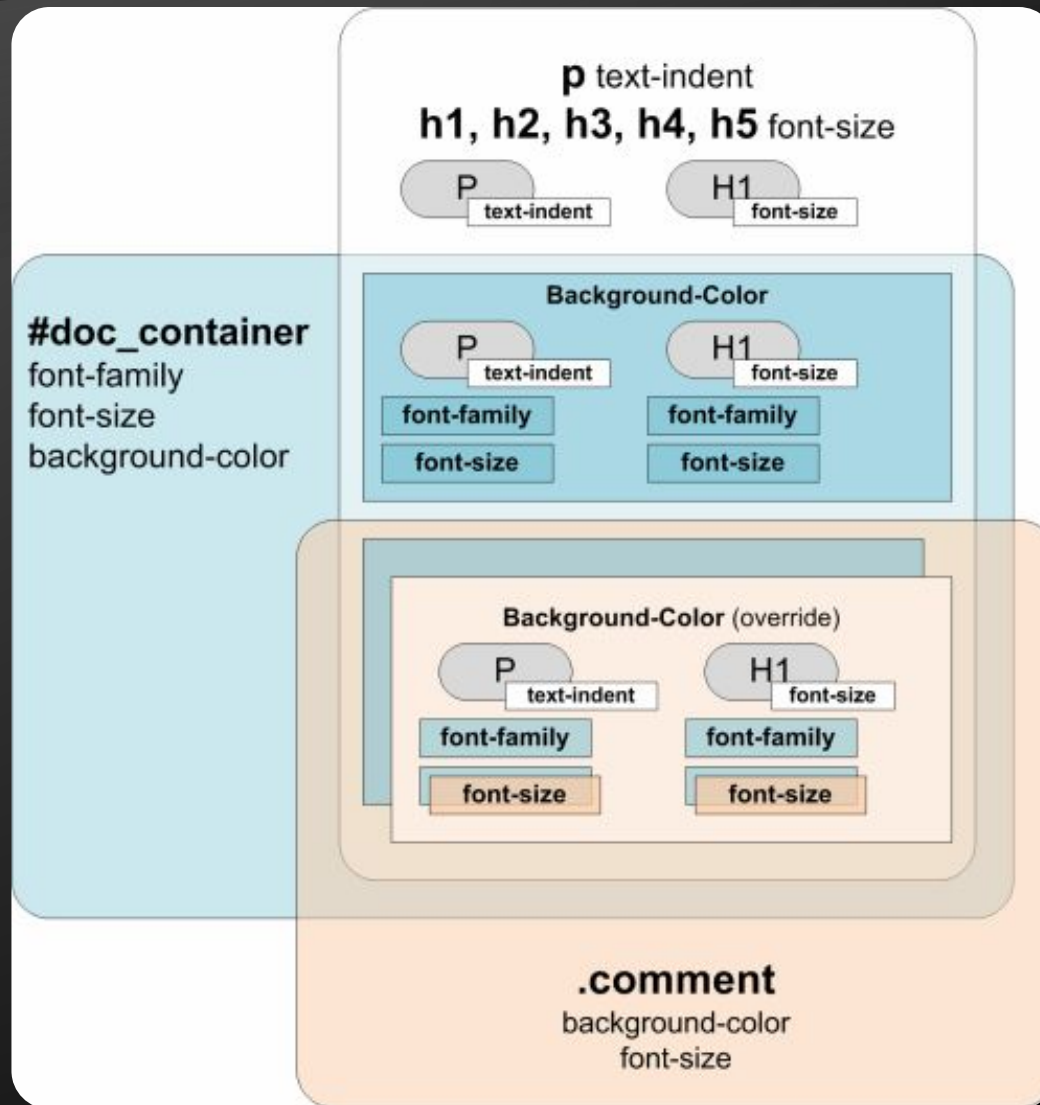
- ◆ **Cascading Style Sheets (CSS)**
 - ◆ **Used to describe the presentation of documents**
 - ◆ **Define sizes, spacing, fonts, colors, layout, etc.**
 - ◆ **Improve content accessibility**
 - ◆ **Improve flexibility**
- ◆ **Designed to separate presentation from content**
- ◆ **Due to CSS, all HTML presentation tags and attributes are deprecated, e.g. font, center, etc.**

- ◆ CSS can be applied to any XML document
 - ◆ Not just to HTML / XHTML
- ◆ CSS can specify different styles for different media
 - ◆ On-screen
 - ◆ In print
 - ◆ Handheld, projection, etc.
 - ◆ ... even by voice or Braille-based reader

Why “Cascading”?

- ◆ **Priority scheme determining which style rules apply to element**
 - ◆ **Cascade priorities or specificity (weight) are calculated and assigned to the rules**
 - ◆ **Child elements in the HTML DOM tree inherit styles from their parent**
 - ◆ **Can override them**
 - ◆ **Control via !important rule**

Why “Cascading”? (2)

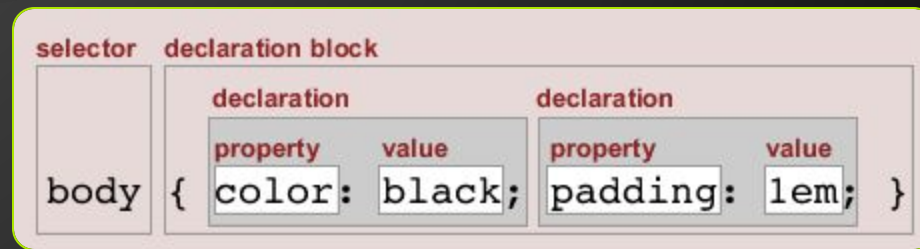


Why “Cascading”? (3)

- ◆ Some CSS styles are inherited and some not
 - ◆ Text-related and list-related properties are inherited - color, font-size, font-family, line-height, text-align, list-style, etc
 - ◆ Box-related and positioning styles are not inherited - width, height, border, margin, padding, position, float, etc
 - ◆ `<a>` elements do not inherit color and text-decoration

Style Sheets Syntax

- ◆ Stylesheets consist of rules, selectors, declarations, properties and values



<http://css.maxdesign.com.au/>

- ◆ Selectors are separated by commas
- ◆ Declarations are separated by semicolons
- ◆ `h1, h2, h3 { color: green; font-weight: bold; }` Properties and values are separated by colons

- ◆ **Selectors determine which element the rule applies to:**
 - ◆ All elements of specific type (tag)
 - ◆ Those that match a specific attribute (id, class)
 - ◆ Elements may be matched depending on how they are nested in the document tree (HTML)
- ◆ **Examples:**

```
.header a { color: green }
```

```
#menu>li { padding-top: 8px }
```

- ◆ Three primary kinds of selectors:

- ◆ By tag (type selector):

```
h1 { font-family: verdana,sans-serif; }
```

- ◆ By element id:

```
#element_id { color: #ff0000; }
```

- ◆ By element class name (only for HTML):

```
.myClass {border: 1px solid red}
```

- ◆ Selectors can be combined with commas:

```
h1, link, #top-link {font-weight: bold}
```

This will match <h1> tags, elements with class link,

- ◆ Pseudo-classes define state
 - ◆ :hover, :visited, :active, :lang
- ◆ Pseudo-elements define element "parts" or are used to generate content
 - ◆ :first-line, :before, :after

```
a:hover { color: red; }  
p:first-line { text-transform: uppercase; }  
.title:before { content: "»"; }  
.title:after { content: "«"; }
```

- ◆ Match relative to element placement:

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

This will match all `<a>` tags that are inside of `<p>`

- ◆ * — universal selector (avoid or use with care!):

```
p * {color: black}
```

This will match all descendants of `<p>` element

- ◆ + selector — used to match “next sibling”:

```
img + .link {float:right}
```

This will match all siblings with class name `link` that appear immediately after `` tag

- ◆ > selector – matches direct child nodes:

```
p > .error {font-size: 8px}
```

This will match all elements with class **error**, direct children of **<p>** tag

- ◆ [] – matches tag attributes by regular expression:

```
img[alt~=logo] {border: none}
```

This will match all **** tags with **alt** attribute containing the word **logo**

- ◆ .class1.class2 (no space) - matches elements with

Values in the CSS Rules

- ◆ Colors are set in RGB format (decimal or hex):
 - ◆ Example: `#a0a6aa = rgb(160, 166, 170)`
 - ◆ Predefined color aliases exist: `black`, `blue`, etc.
- ◆ Numeric values are specified in:
 - ◆ Pixels, ems, e.g. `12px` , `1.4em`
 - ◆ Points, inches, centimeters, millimeters
 - ◆ E.g. `10pt` , `1in`, `1cm`, `1mm`
 - ◆ Percentages, e.g. `50%`
 - ◆ Percentage of what?...
 - ◆ Zero can be used with no unit: `border: 0;`

Default Browser Styles

- ◆ Browsers have default CSS styles
 - ◆ Used when there is no CSS information or any other style information in the document
 - ◆ Caution: default styles differ in browsers
 - ◆ E.g. margins, paddings and font sizes differ
- most often and usually developers reset them

```
* { margin: 0; padding: 0; }
```

```
body, h1, p, ul, li { margin: 0; padding: 0; }
```

Linking HTML and CSS

- ◆ **HTML (content) and CSS (presentation) can be linked in three ways:**
 - ◆ **Inline: the CSS rules in the `style` attribute**
 - ◆ **No selectors are needed**
 - ◆ **Embedded: in the `<head>` in a `<style>` tag**
 - ◆ **External: CSS rules in separate file (best)**
 - ◆ **Usually a file with `.css` extension**
 - ◆ **Linked via `<link rel="stylesheet" href=...>` tag**
or **`@import` directive in embedded CSS block**

Linking HTML and CSS (2)

- ◆ Using external files is highly recommended
 - ◆ Simplifies the HTML document
 - ◆ Improves page load speed as the CSS file is cached

Inline Styles: Example

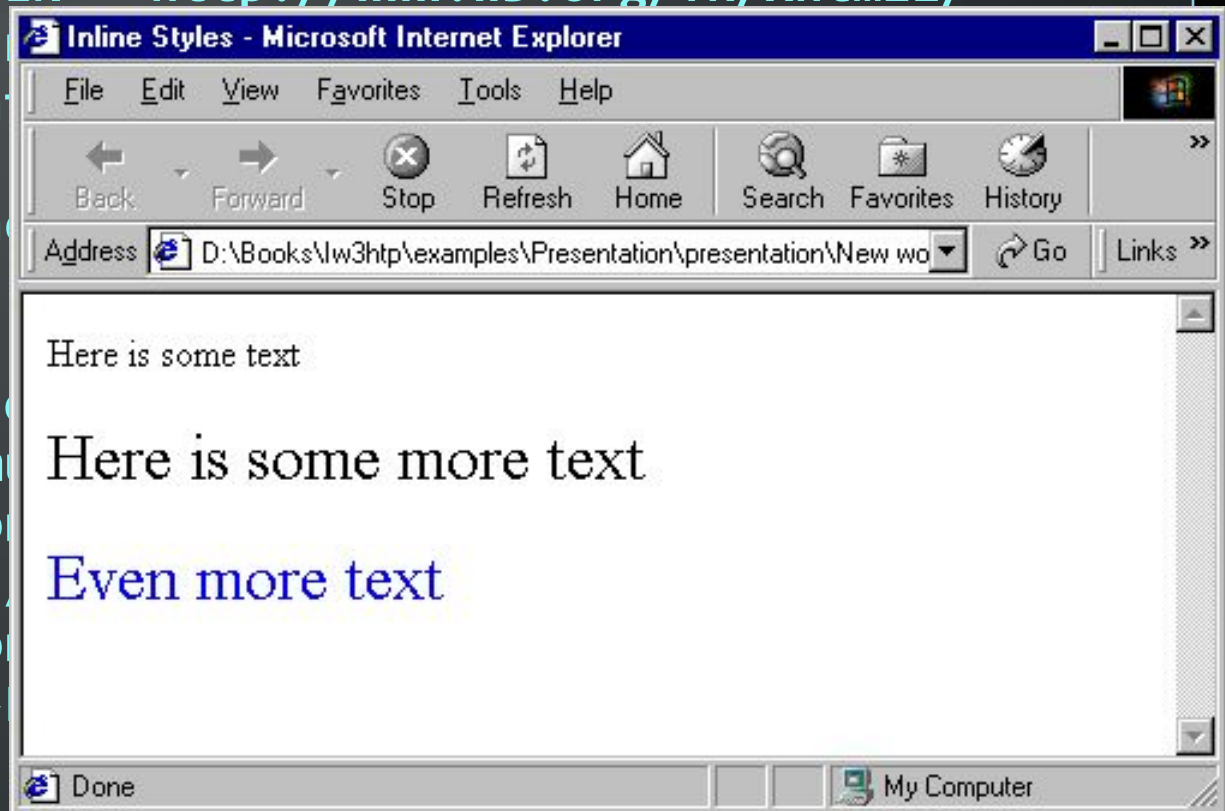
inline-styles.html

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0  
Transitional//EN" "http://www.w3.org/TR/xhtml1/  
DTD/xhtml1-transitional.dtd">  
<html xmlns="http://www.w3.org/1999/xhtml">  
<head>  
  <title>Inline Styles</title>  
</head>  
<body>  
  <p>Here is some text</p>  
<!--Separate multiple styles with a semicolon-->  
  <p style="font-size: 20pt">Here is some  
    more text</p>  
  <p style="font-size: 20pt;color:  
    #0000FF" >Even more text</p>  
</body>  
</html>
```

Inline Styles: Example

inline-styles.html

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
Transitional//EN" "http://www.w3.org/TR/xhtml1/
DTD/xhtml1-tra
<html xmlns="h
<head>
  <title>Inlin
</head>
<body>
  <p>Here is s
<!--Separate m
  <p style="fo
    more text<
  <p style="fo
    #0000FF" >
</body>
</html>
```



CSS Cascade (Precedence)

- ◆ There are browser, user and author stylesheets with "normal" and "important" declarations
 - ◆ Browser styles (least priority)
 - ◆ Normal user styles
 - ◆ Normal author styles (external, in head, inline)
 - ◆ Important author styles
 - ◆ Important user styles (max priority)
`body { color: red !important; }`

<http://www.slideshare.net/maxdesign/css-cascade-1658158>

- ◆ CSS specificity is used to determine the precedence of CSS style declarations with the same origin. Selectors are what matters
 - ◆ Simple calculation: `#id = 100`, `.class = 10`, `:pseudo = 10`, `[attr] = 10`, `tag = 1`, `* = 0`
 - ◆ Same number of points? Order matters.
 - ◆ See also:
 - ◆ <http://www.smashingmagazine.com/2007/07/27/css-specificity-things-you-should-know/>

- ◆ Embedded in the HTML in the `<style>` tag:

```
<style type="text/css">
```

- ◆ The `<style>` tag is placed in the `<head>` section of the document
- ◆ `type` attribute specifies the MIME type
 - ◆ MIME describes the format of the content
 - ◆ Other MIME types include `text/html`, `image/gif`, `text/javascript` ...
- ◆ Used for document-specific styles

Embedded Styles: Example

embedded-stylesheets.html

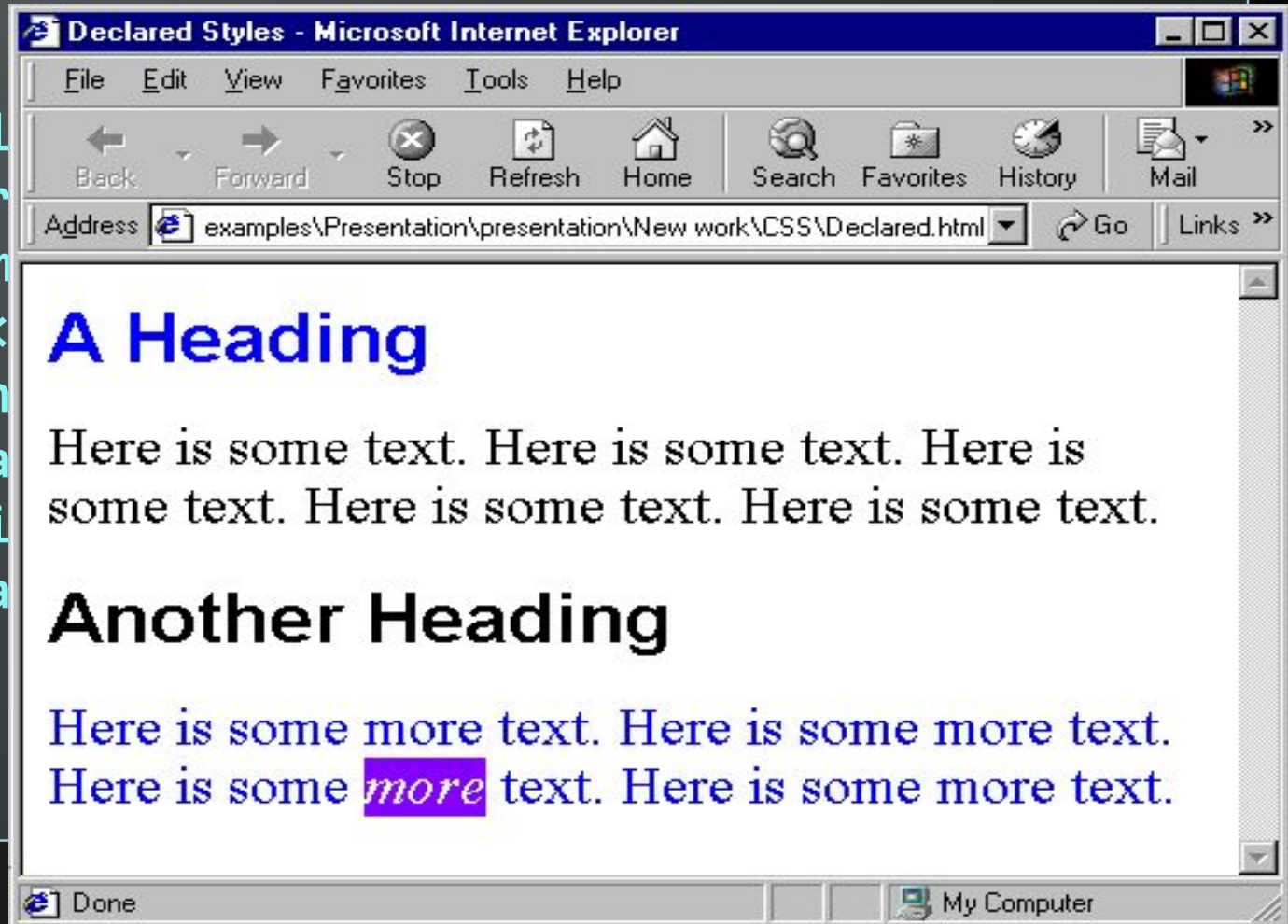
```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0  
Transitional//EN"  
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitio  
nal.dtd">  
<html xmlns="http://www.w3.org/1999/xhtml">  
<head>  
  <title>Style Sheets</title>  
  <style type="text/css">  
    em {background-color:#8000FF; color:white}  
    h1 {font-family:Arial, sans-serif}  
    p {font-size:18pt}  
    .blue {color:blue}  
  </style>  
</head>
```

Embedded Styles: Example (2)

```
...  
<body>  
  <h1 class="blue">A Heading</h1>  
  <p>Here is some text. Here is some text. Here  
  is some text. Here is some text. Here is some  
  text.</p>  
  <h1>Another Heading</h1>  
  <p class="blue">Here is some more text.  
  Here is some more text.</p>  
  <p class="blue">Here is some <em>more</em>  
  text. Here is some more text.</p>  
</body>  
</html>
```

Embedded Styles: Example (3)

```
...
<body>
  <h1 class="declared">A Heading</h1>
  <p>Here is some text. Here is some text. Here is some text.</p>
  <h1>Another Heading</h1>
  <p class="declared">Here is some more text. Here is some more text. Here is some more text.</p>
</body>
</html>
```



- ◆ External linking
 - ◆ Separate pages can all use a shared style sheet
 - ◆ Only modify a single file to change the styles across your entire Web site (see <http://www.csszengarden.com/>)
- ◆ link tag (with a rel attribute)
 - ◆ Specifies a relationship between current document

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

@import

- ◆ Another way to link external CSS files
- ◆ Example:

```
<style type="text/css">  
  @import url("styles.css");  
  /* same as */  
  @import "styles.css";  
</style>
```

- ◆ Ancient browsers do not recognize @import
- ◆ Use @import in an external CSS file to workaround the IE 32 CSS file limit

External Styles: Example

styles.css

```
/* CSS Document */

a      { text-decoration: none }

a:hover { text-decoration: underline;
          color: red;
          background-color: #CCFFCC }

li em   { color: red;
          font-weight: bold }

ul      { margin-left: 2cm }

ul ul   { text-decoration: underline;
          margin-left: .5cm }
```

External Styles: Example (2)

external-styles.html

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
    Transitional//EN"

"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitio
    nal.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
    <title>Importing style sheets</title>
    <link type="text/css" rel="stylesheet"
        href="styles.css" />
</head>
<body>
    <h1>Shopping list for <em>Monday</em>:</h1>
    <li>Milk</li>
```

...

External Styles: Example (3)

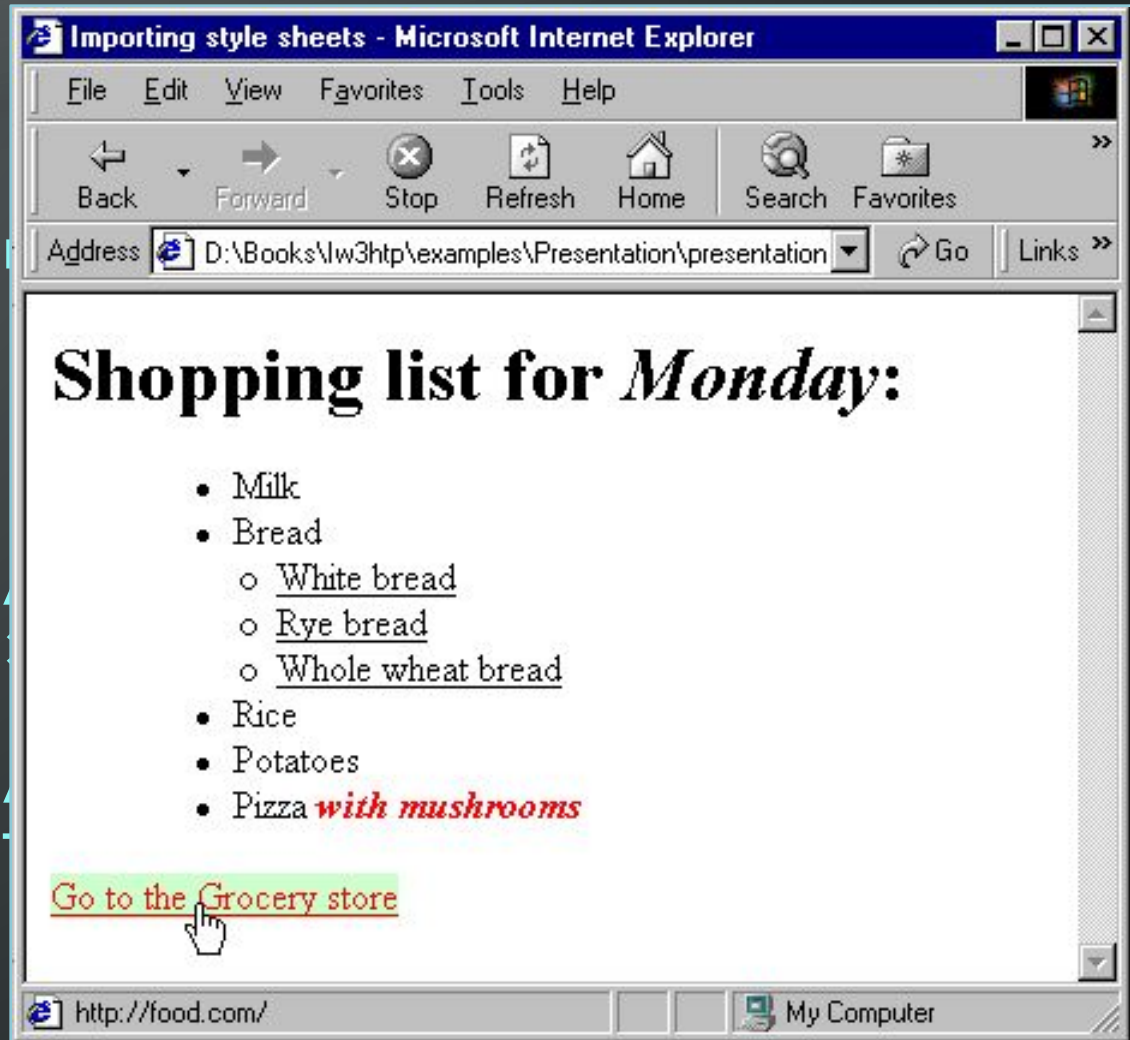
```
...  
<li>Bread  
  <ul>  
    <li>White bread</li>  
    <li>Rye bread</li>  
    <li>Whole wheat bread</li>  
  </ul>  
</li>  
<li>Rice</li>  
<li>Potatoes</li>  
<li>Pizza <em>with mushrooms</em></li>  
</ul>  
<a href="http://food.com" title="grocery  
  store">Go to the Grocery store</a>  
</body>  
</html>
```


External Styles: Example (4)

```

...
<li>Bread
  <ul>
    <li>White
    <li>Rye b
    <li>Whole
  </ul>
</li>
<li>Rice</li>
<li>Potatoes</li>
<li>Pizza <em>
</ul>
<a href="http://
  store">Go to
</body>
</html>

```



Text-related CSS Properties

- ◆ **color** – specifies the color of the text
- ◆ **font-size** – size of font: **xx-small**, **x-small**, **small**, **medium**, **large**, **x-large**, **xx-large**, **smaller**, **larger** or numeric value
- ◆ **font-family** – comma separated font names
 - ◆ **Example:** **verdana**, **sans-serif**, etc.
 - ◆ The browser loads the first one that is available
 - ◆ There should always be at least one generic font
- ◆ **font-weight** can be **normal**, **bold**, **bolder**, **lighter** or a number in range **[100 ... 900]**

CSS Rules for Fonts (2)

- ◆ **font-style** – styles the font
 - ◆ **Values:** normal, italic, oblique
- ◆ **text-decoration** – decorates the text
 - ◆ **Values:** none, underline, line-through, overline, blink
- ◆ **text-align** – defines the alignment of text or other content
 - ◆ **Values:** left, right, center, justify

Shorthand Font Property

◆ font

- ◆ Shorthand rule for setting multiple font properties at the same time

```
font:italic normal bold 12px/16px verdana
```

is equal to writing this:

```
font-style: italic;  
font-variant: normal;  
font-weight: bold;  
font-size: 12px;  
line-height: 16px;  
font-family: verdana;
```

- ◆ background-image

- ◆ URL of image to be used as background, e.g.:

```
background-image:url("back.gif");
```

- ◆ background-color

- ◆ Using color and image and the same time

- ◆ background-repeat

- ◆ repeat-x, repeat-y, repeat, no-repeat

- ◆ background-attachment

- ◆ **background-position:** specifies vertical and horizontal position of the background image
 - ◆ **Vertical position:** top, center, bottom
 - ◆ **Horizontal position:** left, center, right
 - ◆ **Both can be specified in percentage or other numerical values**
- ◆ **Examples:**
 - `background-position: top left;`
 - `background-position: -5px 50%;`

Background Shorthand Property

- ◆ **background:** shorthand rule for setting background properties at the same time:

```
background: #FFF0C0 url("back.gif") no-repeat  
fixed top;
```

is equal to writing:

```
background-color: #FFF0C0;  
background-image: url("back.gif");  
background-repeat: no-repeat;  
background-attachment: fixed;  
background-position: top;
```

- ◆ Some browsers will not apply BOTH color and image for background if using shorthand rule

Background-image or ?

- ◆ Background images allow you to save many image tags from the HTML
 - ◆ Leads to less code
 - ◆ More content-oriented approach
- ◆ All images that are not part of the page content (and are used only for "beautification") should be moved to the CSS

- ◆ **border-width:** thin, medium, thick or numerical value (e.g. 10px)
- ◆ **border-color:** color alias or RGB value
- ◆ **border-style:** none, hidden, dotted, dashed, solid, double, groove, ridge, inset, outset
- ◆ **Each property can be defined separately for left, top, bottom and right**
 - ◆ **border-top-style, border-left-color, ...**

Border Shorthand Property

- ◆ **border:** shorthand rule for setting border properties at once:

```
border: 1px solid red
```

is equal to writing:

```
border-width:1px;  
border-color:red;  
border-style:solid;
```

- ◆ Specify different borders for the sides via shorthand rules: **border-top**, **border-left**, **border-right**, **border-bottom**

Width and Height

- ◆ **width** – defines numerical value for the width of element, e.g. **200px**
- ◆ **height** – defines numerical value for the height of element, e.g. **100px**
 - ◆ By default the height of an element is defined by its content
 - ◆ Inline elements do not apply height, unless you change their **display** style.

Margin and Padding

- ◆ **margin and padding** define the spacing around the element
 - ◆ Numerical value, e.g. **10px** or **-5px**
 - ◆ Can be defined for each of the four sides separately - **margin-top**, **padding-left**, ...
 - ◆ **margin** is the spacing outside of the border
 - ◆ **padding** is the spacing between the border and the content
 - ◆ What are collapsing margins?

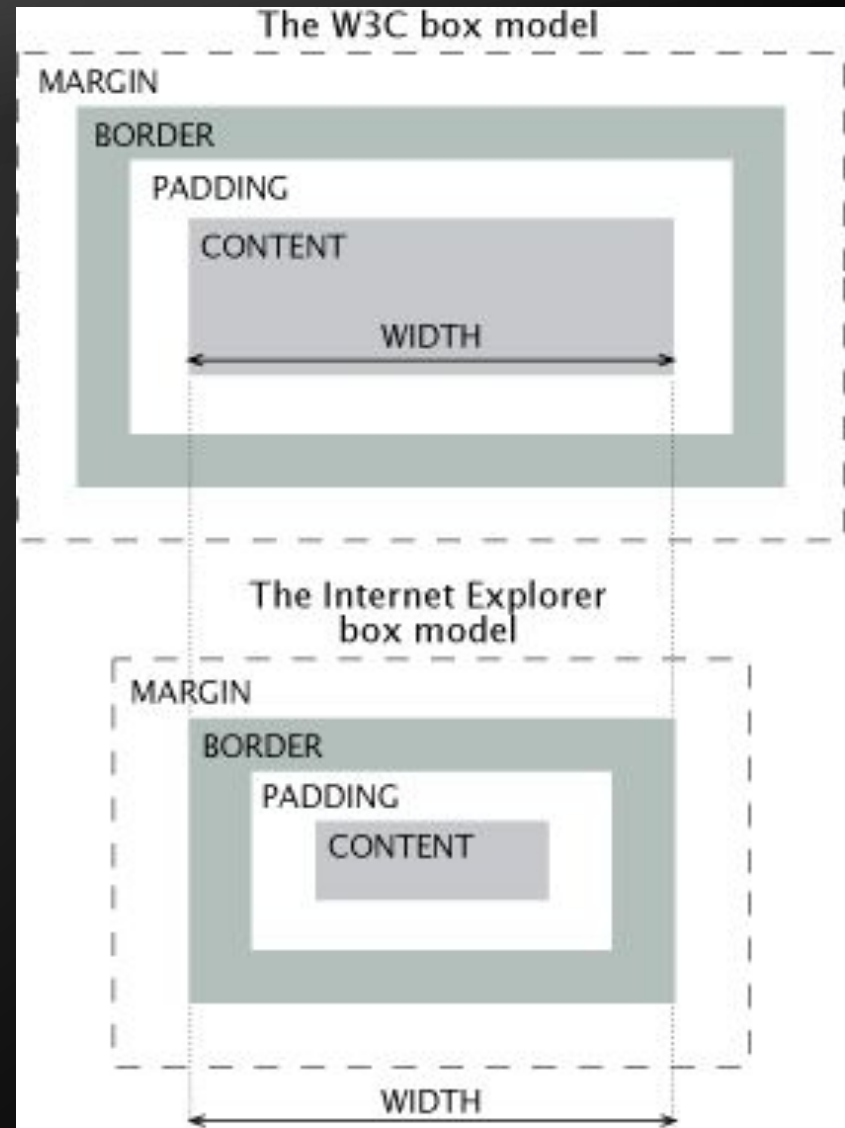
Margin and Padding: Short Rules

- ◆ `margin: 5px;`
 - ◆ Sets all four sides to have margin of 5 px;
- ◆ `margin: 10px 20px;`
 - ◆ top and bottom to 10px, left and right to 20px;
- ◆ `margin: 5px 3px 8px;`
 - ◆ top 5px, left/right 3px, bottom 8px
- ◆ `margin: 1px 3px 5px 7px;`
 - ◆ top, right, bottom, left (clockwise from top)
- ◆ Same for padding

The Box Model



- ◆ When using quirks mode (pages with no DOCTYPE or with a HTML 4 Transitional DOCTYPE), Internet Explorer violates the box model standard



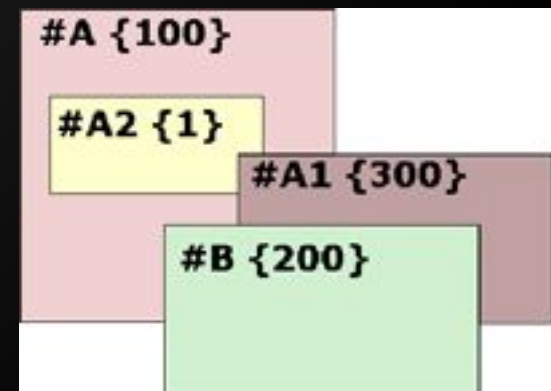
- ◆ **position:** defines the positioning of the element in the page content flow
- ◆ The value is one of:
 - ◆ **static** (default)
 - ◆ **relative** – relative position according to where the element would appear with static position
 - ◆ **absolute** – position according to the innermost positioned parent element
 - ◆ **fixed** – same as **absolute**, but ignores page scrolling

- ◆ **Margin VS relative positioning**
- ◆ **Fixed and absolutely positioned elements do not influence the page normal flow and usually stay on top of other elements**
 - ◆ **Their position and size is ignored when calculating the size of parent element or position of surrounding elements**
 - ◆ **Overlaid according to their z-index**
 - ◆ **Inline fixed or absolutely positioned elements can apply height like block-level elements**

- ◆ **top, left, bottom, right**: specifies offset of absolute/fixed/relative positioned element as numerical values
- ◆ **z-index** : specifies the stack level of positioned elements
- ◆ **Understanding stacking context**

Each positioned element creates a stacking context.

Elements in different stacking contexts are overlapped according to the stacking order of their containers. For example, there is no way for #A1 and #A2 (children of #A) to be placed over #B without increasing the z-index of #A.

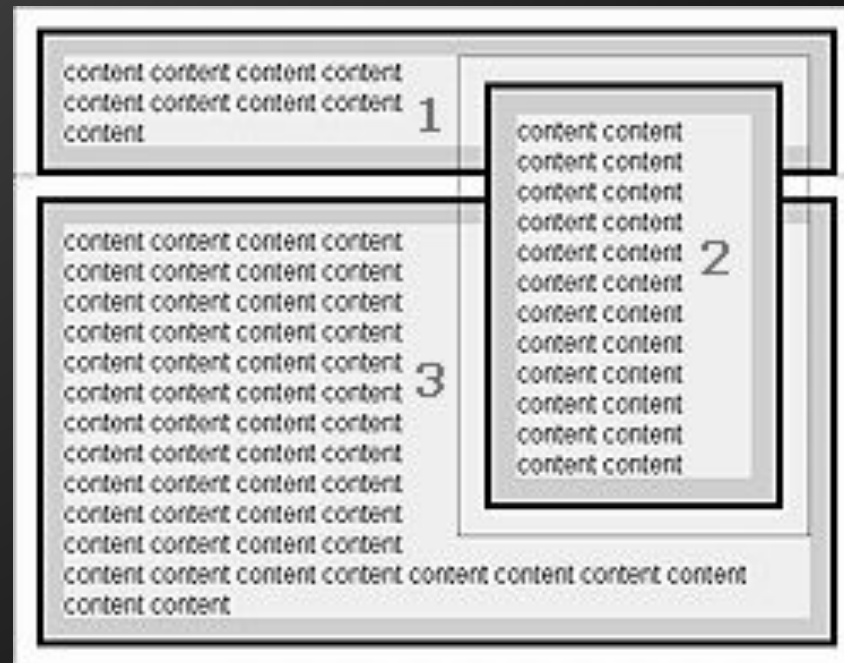


Inline element positioning

- ◆ **vertical-align**: sets the vertical-alignment of an inline element, according to the line height
 - ◆ **Values**: baseline, sub, super, top, text-top, middle, bottom, text-bottom or numeric
- ◆ **Also used for content of table cells (which apply middle alignment by default)**

- ◆ **float:** the element “floats” to one side
 - ◆ **left:** places the element on the left and following content on the right
 - ◆ **right:** places the element on the right and following content on the left
 - ◆ **floated elements should come before the content that will wrap around them in the code**
 - ◆ **margins of floated elements do not collapse**
 - ◆ **floated inline elements can apply height**

◆ How floated elements are positioned



◆ clear

- ◆ Sets the sides of the element where other floating elements are NOT allowed
 - ◆ Used to "drop" elements below floated ones or expand a container, which contains only floated children
 - ◆ Possible values: left, right, both
- ## ◆ Clearing floats
- ◆ additional element (<div>) with a clear style

◆ Clearing floats (continued)

- ◆ `:after { content: ""; display: block; clear: both; height: 0; }`
- ◆ **Triggering hasLayout in IE expands a container of floated elements**
 - ◆ `display: inline-block;`
 - ◆ `zoom: 1;`

- ◆ **opacity**: specifies the opacity of the element
 - ◆ Floating point number from 0 to 1
 - ◆ For old Mozilla browsers use **-moz-opacity**
 - ◆ For IE use **filter:alpha(opacity=value)** where value is from 0 to 100; also, "binary and script behaviors" must be enabled and **hasLayout** must be triggered, e.g. with **zoom:1**

◆ visibility

- ◆ **Determines whether the element is visible**
- ◆ **hidden: element is not rendered, but still occupies place on the page (similar to `opacity:0`)**
- ◆ **visible: element is rendered normally**

- ◆ **display:** controls the display of the element and the way it is rendered and if breaks should be placed before and after the element
- ◆ **inline:** no breaks are placed before and after (`` is an inline element)
- ◆ **block:** breaks are placed before AND after the element (`<div>` is a block element)

- ◆ **display:** controls the display of the element and the way it is rendered and if breaks should be placed before and after the element
- ◆ **none:** element is hidden and its dimensions are not used to calculate the surrounding elements rendering (differs from **visibility: hidden!**)
- ◆ There are some more possible values, but not all browsers support them
 - ◆ Specific displays like **table-cell** and **table-row**

- ◆ **overflow**: defines the behavior of element when content needs more space than you have specified by the size properties or for other reasons. Values:
 - ◆ **visible** (default) – content spills out of the element
 - ◆ **auto** - show scrollbars if needed
 - ◆ **scroll** – always show scrollbars
 - ◆ **hidden** – any content that cannot fit is clipped

Other CSS Properties

- ◆ **cursor:** specifies the look of the mouse cursor when placed over the element
 - ◆ **Values:** crosshair, help, pointer, progress, move, hair, col-resize, row-resize, text, wait, copy, drop, and others
- ◆ **white-space** – controls the line breaking of text. Value is one of:
 - ◆ **nowrap** – keeps the text on one line
 - ◆ **normal** (default) – browser decides whether to brake the lines if needed

Benefits of using CSS

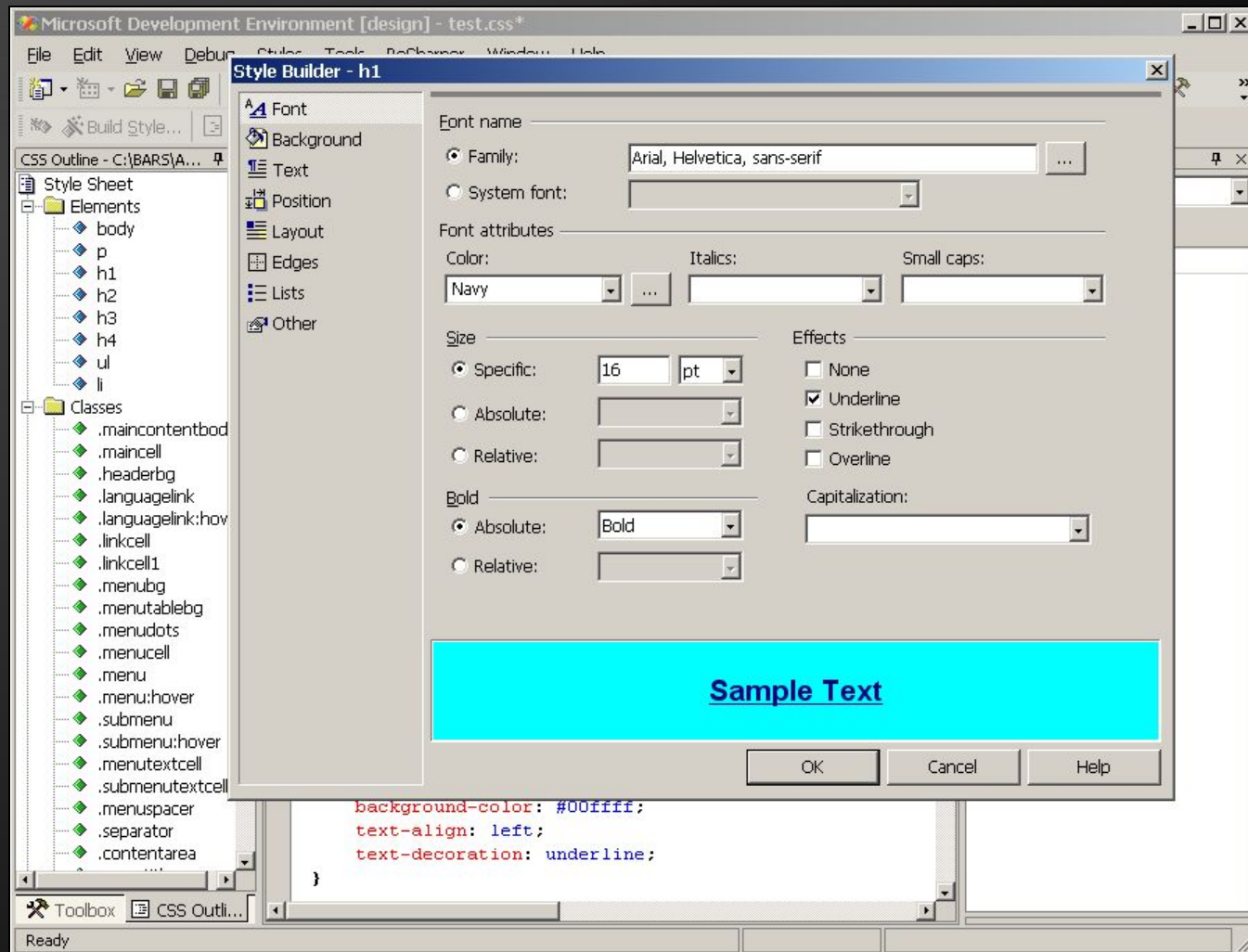
- ◆ More powerful formatting than using presentation tags
- ◆ Your pages load faster, because browsers cache the `.css` files
- ◆ Increased accessibility, because rules can be defined according given media
- ◆ Pages are easier to maintain and update

Maintenance Example

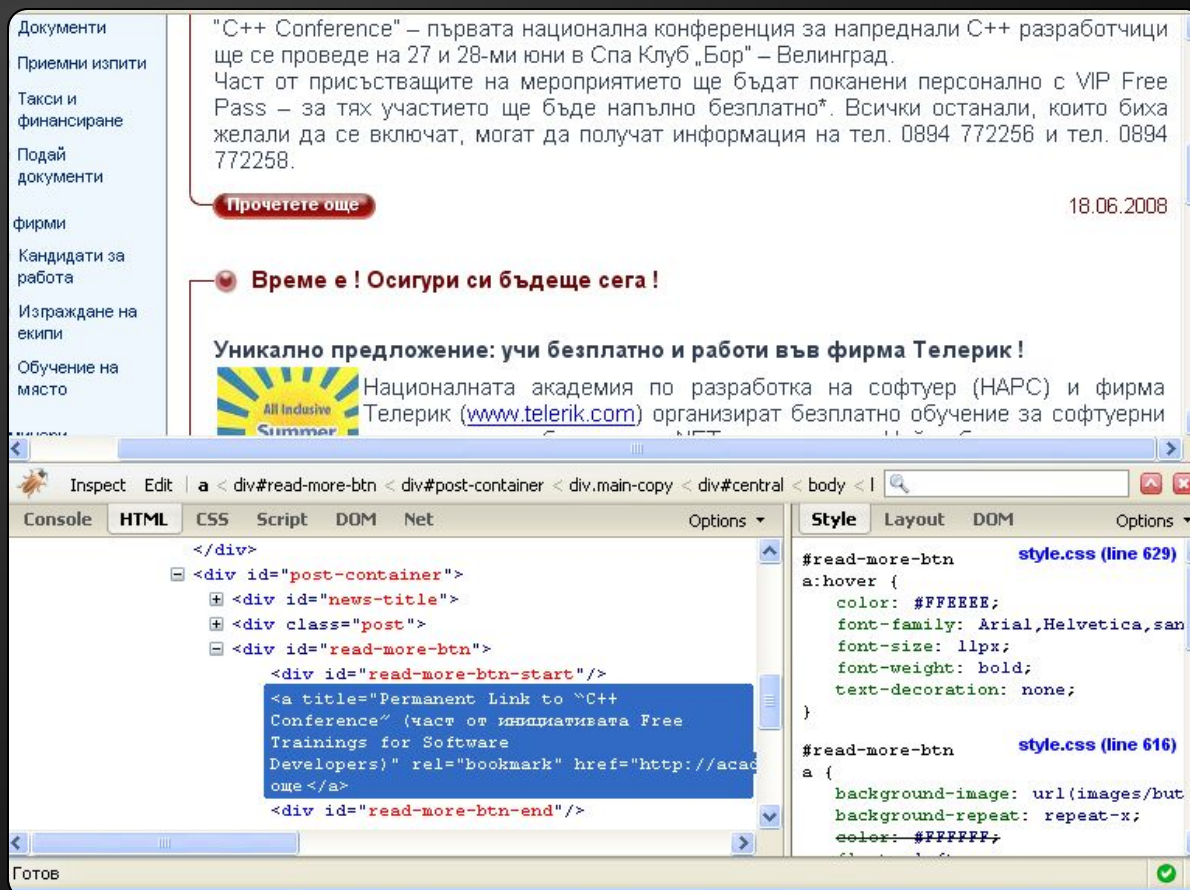


CS
S
file

◆ Visual Studio – CSS Editor



- ◆ Firebug – add-on to Firefox used to examine and adjust CSS and HTML



CSS Development Tools (4)

- ◆ IE Developer Toolbar – add-on to IE used to examine CSS and HTML (press [F12])

