



CSS: Cascading Style Sheets

Source: refer from the lecture of Dr. Boris Jukic
IS400: Development of Business Applications on the Internet

Objectives

- **Topics covered:**
 - Using a style sheet to give all the pages of a website the same look and feel.
 - Style sheet types and cascade precedence
 - CSS syntax for assigning style properties
 - Class selector and using the `class` attribute to apply styles.
 - Using style sheets to separate presentation from content.

Introduction

- **Cascading Style Sheets (CSS)**
 - Separation of structure from presentation
 - Relationship between the style formatting and the structure/content is no longer 1:1
 - multiple style sheets can be applied to the same Web page
 - Same style sheet can be applied to the multiple Web page

Multiple Levels of Style Definition

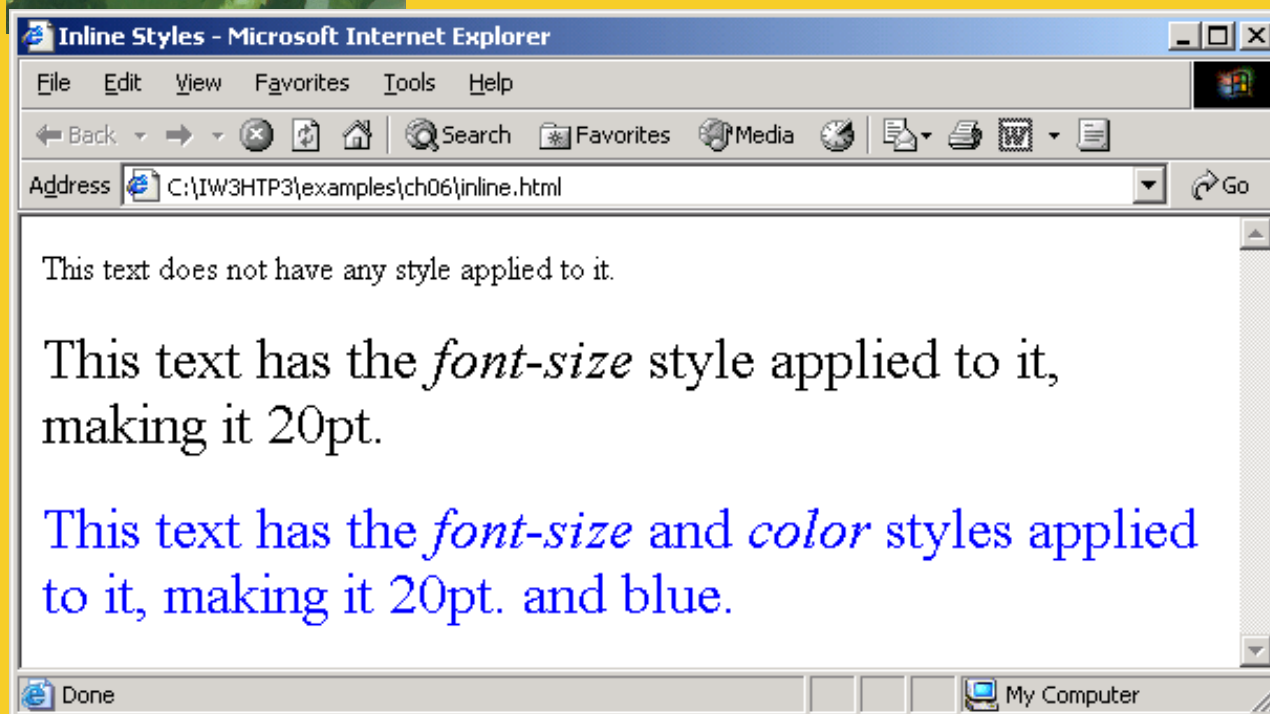
- **Cascade Precedence: resolves conflicting style rules**
 - Inline style sheets
 - Embedded sheets
 - External style sheets
 - Author vs. User

Inline Styles

- **style information is directly attached to the HTML elements they affect**
- **higher cascade precedence than the other specification methods**
- **declaring an individual element's format:**
 - Attribute style
 - CSS (style) property
 - Followed by a colon and a value

```
1 <?xml version = "1.0"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
3   "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
4
5 <!-- Fig. 6.1: inline.html -->
6 <!-- Using inline styles -->
7
8 <html xmlns = "http://www.w3.org/1999/xhtml">
9   <head>
10     <title>Inline Styles</title>
11   </head>
12
13   <body>
14
15     <p>This text does not have any style applied to it.</p>
16
17     <!-- The style attribute allows you to declare -->
18     <!-- inline styles. Separate multiple styles -->
19     <!-- with a semicolon. -->
20     <p style = "font-size: 20pt">This text has the
21     <em>font-size</em> style applied to it, making it 20pt.
22     </p>
23
```

```
24 <p style = "font-size: 20pt; color: #0000ff">
25     This text has the <em>font-size</em> and
26     <em>color</em> styles applied to it, making it
27     20pt. and blue.</p>
28
29 </body>
30 </html>
```



Embedded Style Sheets

- **this method can only specify style information for the current document:**
 - 1:1 relationship
 - However, the same document may have other style definitions applied to it
 - 1:M relationship
- **embedded style sheet rule will have higher precedence than external style sheet rule, if there is a conflict between styles**
- **embedded style sheet rule will have lower precedence than an inline style sheet rule**

Embedded Style Sheets

- **Embed an entire CSS document in an XHTML document's head section inside a style element**
 - Attribute type
 - Multipurpose Internet Mail Extensions (MIME) type
 - describes the type of the document's content
 - text/css is the type for CSS document
 - Style properties are defined for:
 - Existing defined elements, such as p (paragraph), h3 (header), li (list) or any other
 - *Style class* that can be applied to either:
 - Any existing type of element in the body of the document or
 - One specific element in the document

CSS Syntax for Assigning Style Properties

- The CSS syntax is made up of three parts: a selector, a property and a value:
 - `selector {property: value}`
- A selector can be:
 - the HTML element/tag you wish to define. In this example:
 - `body {color: black}` , element `body` is the selector
 - The class selector, which can be tied to a specific element, such as:
 - `p.right {text-align: right}`
 - The class selector applicable to any element, such as:
 - `.loud {font-family: fantasy; font-size: xx-large}`
- If a class selector is used, it has to be invoked in the body of the XHTML document:
 - `<p class="right">` or
 - `<table class="loud">`

CSS Syntax for Assigning Style Properties: additional issues

- Group selectors are possible for a group of HTML elements. For example:
 - `h1,h2,h3,h4,h5,h6 {color: green}` will make all header elements text green
- When a class selector is defined for a particular element, it can not be invoked on other elements. Using example from the previous slide which of these uses of class styles in the XHTML document is correct?
 - `<ul class = "loud">`
 - `<ul class = "right">`
- Pseudo-class selectors define the style for the parts of a document based on some characteristics other than tag name, attributes or content. They may be defined by a user action such as:
 - Mouseover (hover pseudoclass)
 - Clicking (active pseudoclass)

CSS syntax: continue

- **Invoking a style class to a block of text not defined by a particular element**
 - span element
 - div element (block level element)

Style Inheritance and Conflict Resolution

- **Inheritance**

- An element that is present within another element (child) inherits all style properties from its “parent” element
- However, if such child (or descendant) element has properties that conflict with defined properties of its parent element, conflict is resolved in favors of properties of a child element
 - Child element properties have greater *specificity* than ancestor’s properties

```

1  <?xml version = "1.0"?>
2  <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
3      "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
4
5  <!-- Fig. 6.2: declared.html -->
6  <!-- Declaring a style sheet in the header section. -->
7
8  <html xmlns = "http://www.w3.org/1999/xhtml">
9      <head>
10         <title>Style Sheets</title>
11
12         <!-- this begins the style sheet section -->
13         <style type = "text/css">
14
15             em { background-color: #8000ff;
16                 color: white }
17
18             h1 { font-family: arial, sans-serif }
19
20             p { font-size: 14pt }
21
22             .special { color: blue }
23
24         </style>
25     </head>

```

← Style Class selector: applicable
to any element in this document

26

27 <body>

28

29 <!-- this class attribute applies the .special style -->

30 <h1 class = "special">Deitel & Associates, Inc.</h1>

← Style Class “special”
invoked for h1 element

31

32 <p>Deitel & Associates, Inc. is an internationally

33 recognized corporate training and publishing organization

34 specializing in programming languages, Internet/World

35 wide web technology and object technology education.

36 Deitel & Associates, Inc. is a member of the world wide

37 Web Consortium. The company provides courses on Java,

38 C++, Visual Basic, C, Internet and world wide web

39 programming, and Object Technology.</p>

40

41 <h1>Clients</h1>

42 <p class = "special"> The company's clients include many

← Style Class “special”
invoked for p element

43 Fortune 1000 companies, government agencies,

44 branches of the military and business organizations.

45 Through its publishing partnership with Prentice Hall,

46 Deitel & Associates, Inc. publishes leading-edge

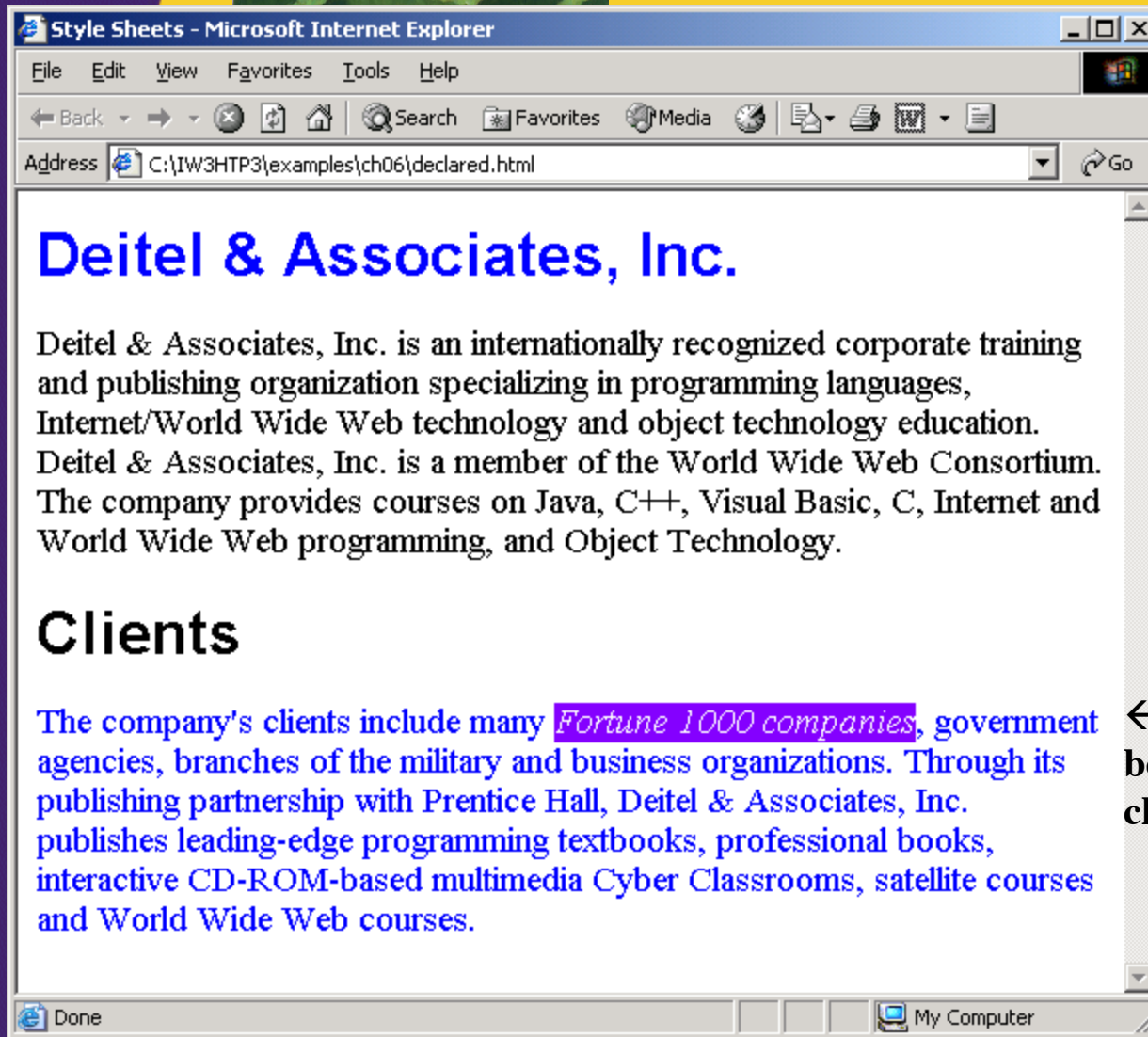
47 programming textbooks, professional books, interactive

48 CD-ROM-based multimedia Cyber Classrooms, satellite

49 courses and world wide web courses.</p>

50 </body>

51 </html>



← color Conflict resolution
between parent element p and
child element em


```

1 <?xml version = "1.0"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
3   "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
4
5 <!-- Fig 6.3: advanced.html -->
6 <!-- More advanced style sheets -->
7
8 <html xmlns = "http://www.w3.org/1999/xhtml">
9   <head>
10     <title>More Styles</title>
11
12     <style type = "text/css">
13
14       a.nodect { text-decoration: none }
15
16       a:hover { text-decoration: underline;
17                color: red;
18                background-color: #ccffcc }
19
20       li em    { color: red;
21                font-weight: bold }
22
23       ul      { margin-left: 75px }
24

```

← Style Class: applicable only to element **a** in this document

← Pseudoclass: applicable only to element **a** in this document. (note different syntax)

← This is **NOT** a group selector. It declares that this specific style is applicable to **em** elements inside an **li** element

```
25         ul ul      { text-decoration: underline;
26                     margin-left: 15px }
27
28     </style>
29 </head>
30
31 <body>
32
33     <h1>Shopping list for <em>Monday</em>:</h1>
34
35     <ul>
36         <li>Milk</li>
37         <li>Bread
38             <ul>
39                 <li>white bread</li>
40                 <li>Rye bread</li>
41                 <li>whole wheat bread</li>
42             </ul>
43         </li>
44         <li>Rice</li>
45         <li>Potatoes</li>
46         <li>Pizza <em>with mushrooms</em></li>
47     </ul>
48
```

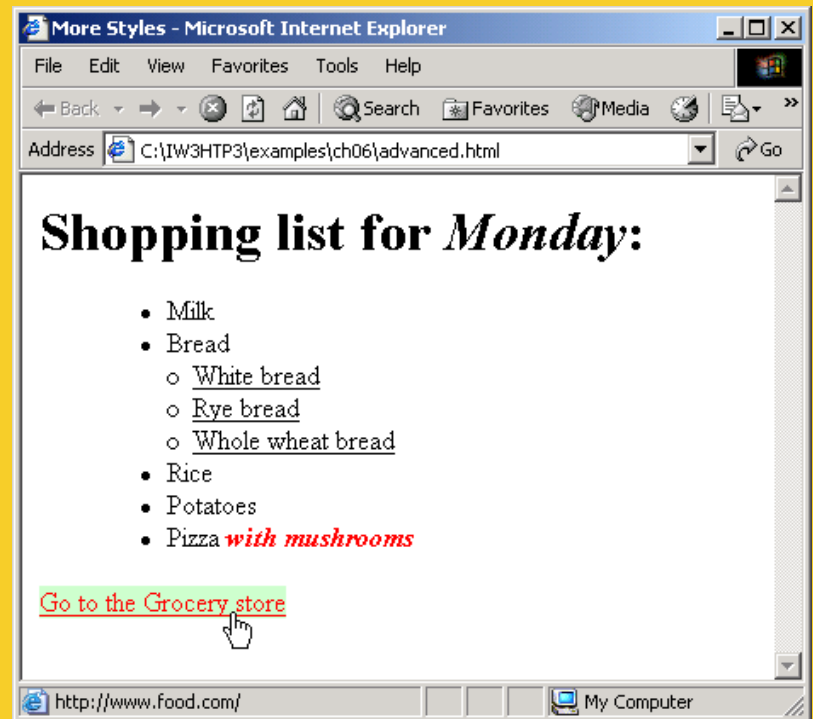
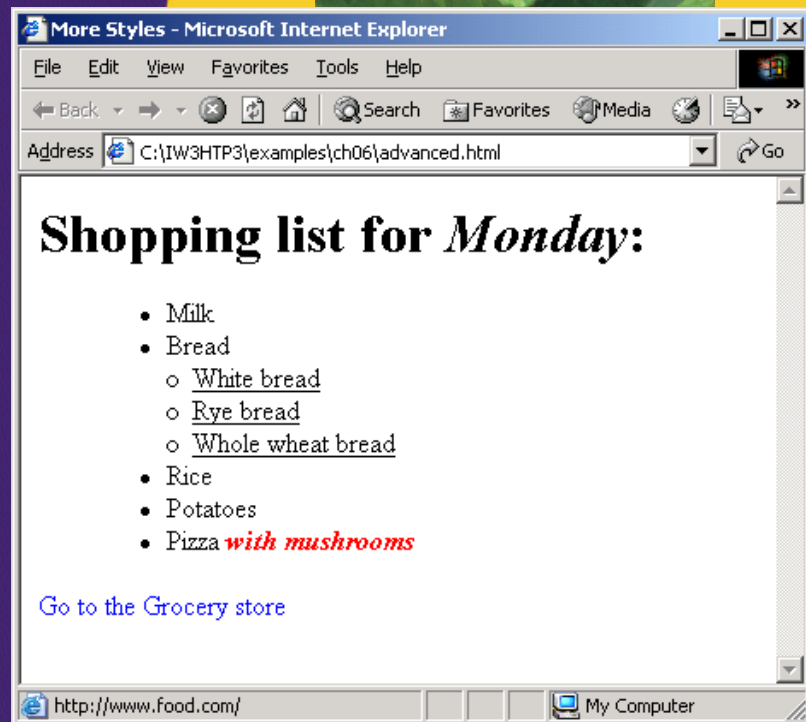
49 <p>

50 Go to the Grocery store</p>

51

52 </body>

53 </html>



External Style Sheets

- **External style sheets**
 - Applicable to more than document
 - Documents can have more than one source for style specification
 - M:M relationship
- **Can provide uniform look and feel to entire site**
- **Same CSS syntax rules for assigning and invoking style properties apply**

External Style Sheets

- **Location (href) and type (type) of the external style sheet are specified as attributes of a link element in the head portion of an XHTML document**
- **In addition, the rel attribute specifies the nature of the relationship between the stylesheet and the document that is referencing it**
 - Persistent stylesheets must be applied to the document
 - Preferred style sheet should be applied unless the user has selected a different alternate
 - Alternate style sheets may be selected by users depending on their preferences

Linking External Style Sheets

- To make a style sheet *persistent*, set the `rel` attribute to "stylesheet".
- To make a style sheet *preferred*, set the `rel` attribute to "stylesheet" and name the style sheet with the additional `title` attribute.
- To specify an *alternate* style sheet, set the `rel` attribute to "alternate stylesheet" and name the style sheet with the `title` attribute.

```
1  /* Fig. 6.4: styles.css */
2  /* An external stylesheet */
3
4  a      { text-decoration: none }
5
6  a:hover { text-decoration: underline;
7             color: red;
8             background-color: #ccffcc }
9
10 li em   { color: red;
11            font-weight: bold;
12            background-color: #ffffff }
13
14 ul      { margin-left: 2cm }
15
16 ul ul   { text-decoration: underline;
17            margin-left: .5cm }
```

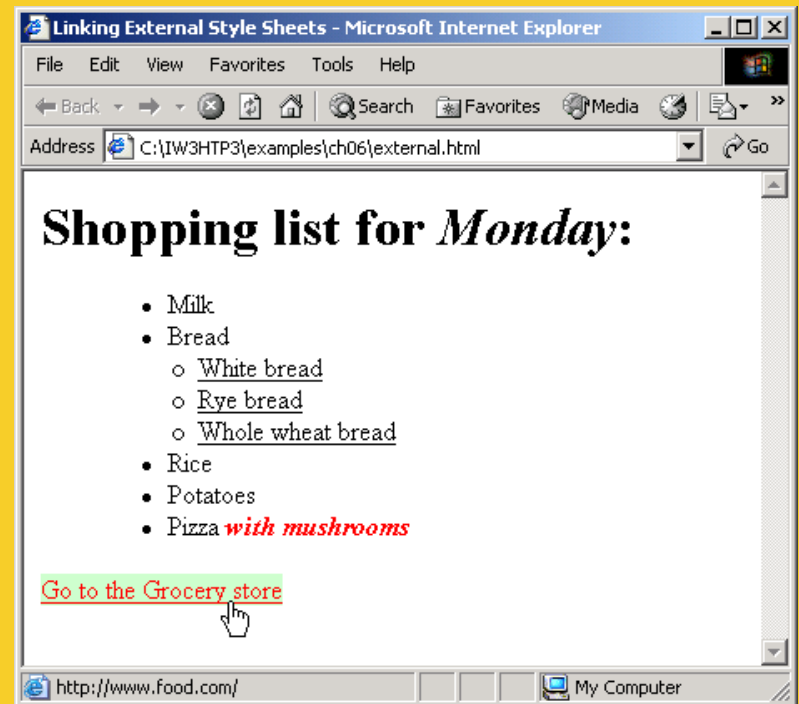
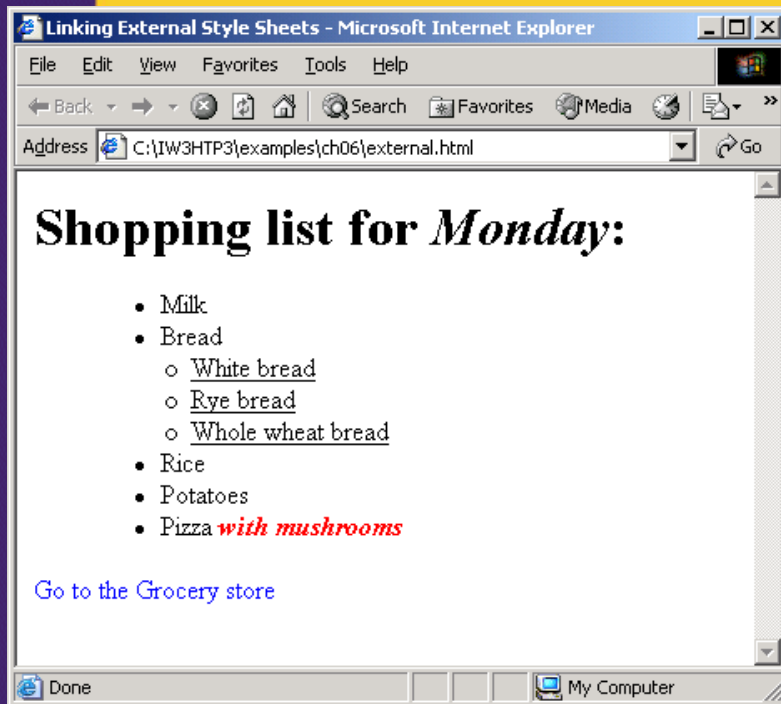
```
1 <?xml version = "1.0"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
3     "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
4
5 <!-- Fig. 6.5: external.html      -->
6 <!-- Linking external style sheets -->
7
8 <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10         <title>Linking External Style Sheets</title>
11         <link rel = "stylesheet" type = "text/css"
12             href = "styles.css" />
13     </head>
14
15     <body>
16
17         <h1>Shopping list for <em>Monday</em>:</h1>
18         <ul>
19             <li>Milk</li>
20             <li>Bread
21                 <ul>
22                     <li>White bread</li>
23                     <li>Rye bread</li>
24                     <li>Whole wheat bread</li>
25                 </ul>
26             </li>
27         </ul>
28     </body>
29 </html>
```



```

26         </li>
27         <li>Rice</li>
28         <li>Potatoes</li>
29         <li>Pizza <em>with mushrooms</em></li>
30     </ul>
31
32     <p>
33         <a href = "http://www.food.com">Go to the Grocery store</a>
34     </p>
35
36 </body>
37 </html>

```



W3C CSS Validation Service

- **Validates external CSS documents**
- **Ensures that style sheets are syntactically correct**
- **<http://jigsaw.w3.org/css-validator/>**

6.10 Text Flow and the Box Model

- **Floating**
 - Move an element to one side of the screen
- **Box model**
 - Margins
 - Padding
 - Border

```
1 <?xml version = "1.0"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
3     "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
4
5 <!-- Fig. 6.12: floating.html          -->
6 <!-- Floating elements and element boxes -->
7
8 <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10         <title>Flowing Text Around Floating Elements</title>
11
12         <style type = "text/css">
13
14             div { background-color: #ffccff;
15                 margin-bottom: .5em;
16                 font-size: 1.5em;
17                 width: 50% }
18
19             p   { text-align: justify }
20
21         </style>
22
23     </head>
24
```

25 <body>

26
27 <div style = "text-align: center">

28 Deitel & Associates, Inc.</div>

29
30 <div style = "float: right; margin: .5em;
31 text-align: right">

32 Corporate Training and Publishing</div>

33
34 <p>Deitel & Associates, Inc. is an internationally
35 recognized corporate training and publishing organization
36 specializing in programming languages, Internet/world
37 wide web technology and object technology education.
38 The company provides courses on Java, C++, Visual Basic, C,
39 Internet and world wide web programming, and Object Technology.</p>

40
41 <div style = "float: right; padding: .5em;
42 text-align: right">

43 Leading-Edge Programming Textbooks</div>

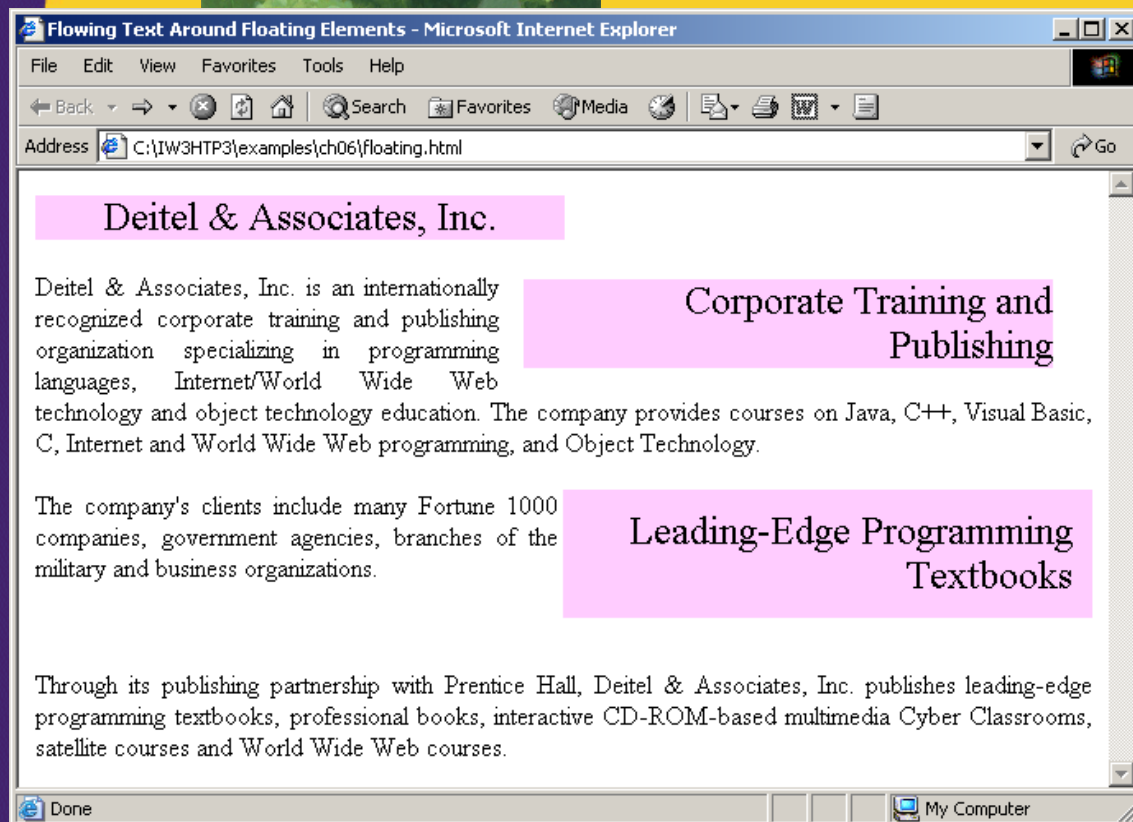
44
45 <p>The company's clients include many Fortune 1000
46 companies, government agencies, branches of the military
47 and business organizations.</p>

48

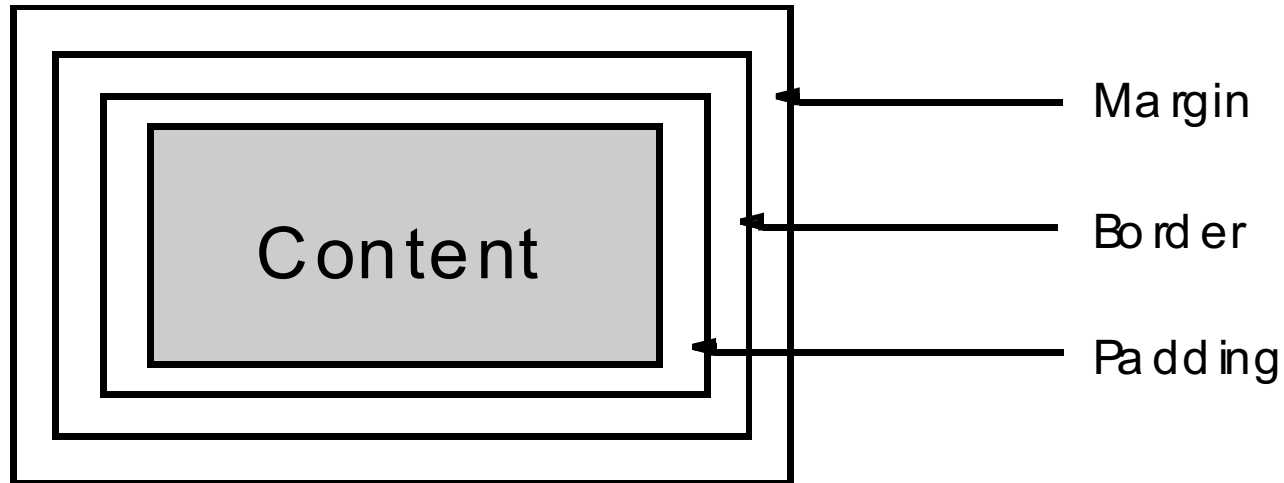
```
49 <p style = "clear: right">Through its publishing  
50 partnership with Prentice Hall, Deitel & Associates,  
51 Inc. publishes leading-edge programming textbooks,  
52 professional books, interactive CD-ROM-based multimedia  
53 cyber classrooms, satellite courses and world wide web  
54 courses.</p>
```

```
55  
56 </body>
```

```
57 </html>
```



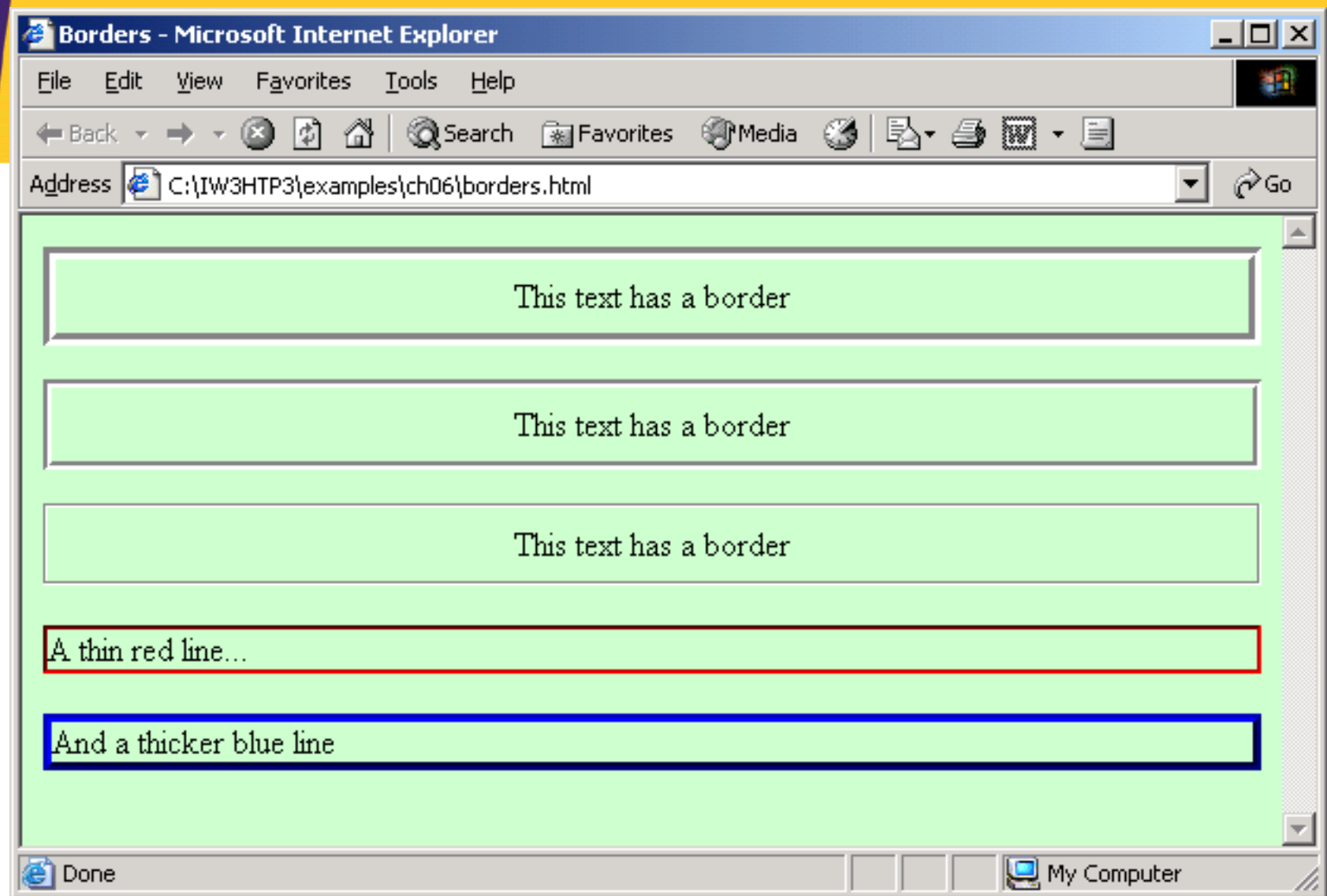
Text Flow and the Box Model



```
1 <?xml version = "1.0"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
3     "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
4
5 <!-- Fig. 6.14: borders.html      -->
6 <!-- Setting borders of an element -->
7
8 <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10         <title>Borders</title>
11
12         <style type = "text/css">
13
14             body    { background-color: #ccffcc }
15
16             div     { text-align: center;
17                     margin-bottom: 1em;
18                     padding: .5em }
19
20             .thick  { border-width: thick }
21
22             .medium { border-width: medium }
23
24             .thin   { border-width: thin }
25
```



```
26     .groove { border-style: groove }
27
28     .inset { border-style: inset }
29
30     .outset { border-style: outset }
31
32     .red { border-color: red }
33
34     .blue { border-color: blue }
35
36 </style>
37 </head>
38
39 <body>
40
41     <div class = "thick groove">This text has a border</div>
42     <div class = "medium groove">This text has a border</div>
43     <div class = "thin groove">This text has a border</div>
44
45     <p class = "thin red inset">A thin red line...</p>
46     <p class = "medium blue outset">
47         And a thicker blue line</p>
48
49 </body>
50 </html>
```



User Style Sheets

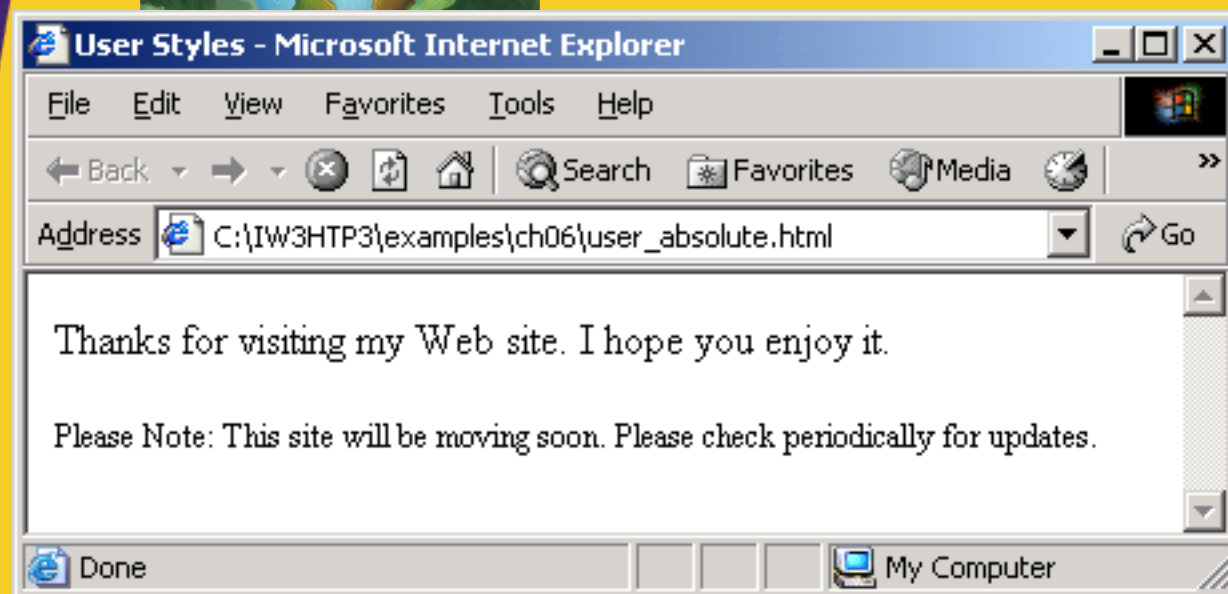
- **Format pages based on user preferences**
- **User style sheets are not linked in the document**
 - They are set in browser's options

```
1 <?xml version = "1.0"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
3     "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
4
5 <!-- Fig. 6.16: user_absolute.html -->
6 <!-- User styles -->
7
8 <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10         <title>User Styles</title>
11
12         <style type = "text/css">
13
14             .note { font-size: 9pt }
15
16         </style>
17     </head>
18
19     <body>
20
21         <p>Thanks for visiting my web site. I hope you enjoy it.
22         </p><p class = "note">Please Note: This site will be
23         moving soon. Please check periodically for updates.</p>
```

24

25 </body>

26 </html>



```
1  /* Fig. 6.17: userstyles.css */
2  /* A user stylesheet      */
3
4  body    { font-size: 20pt;
5           color: yellow;
6           background-color: #000080 }
```



User Style Sheets

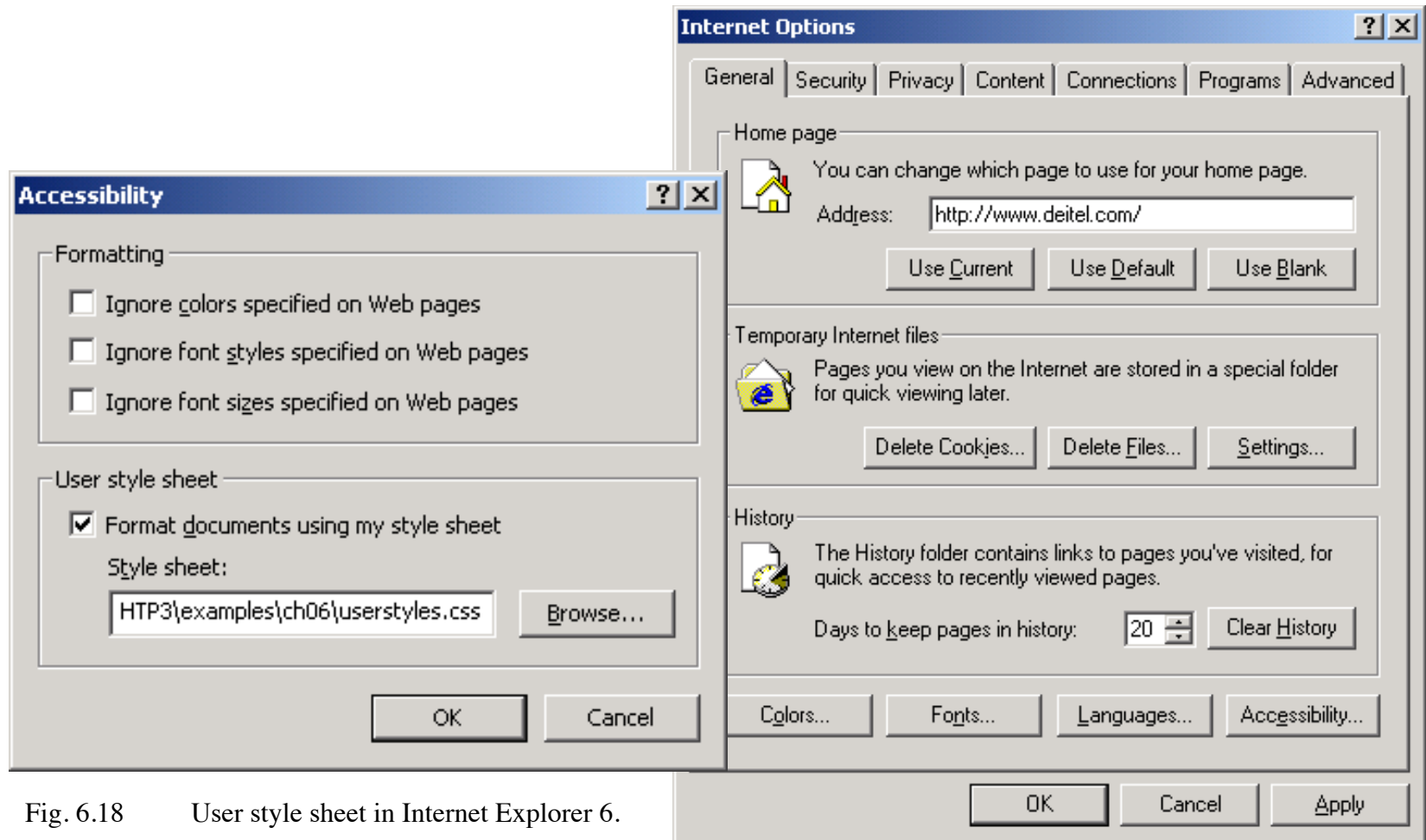
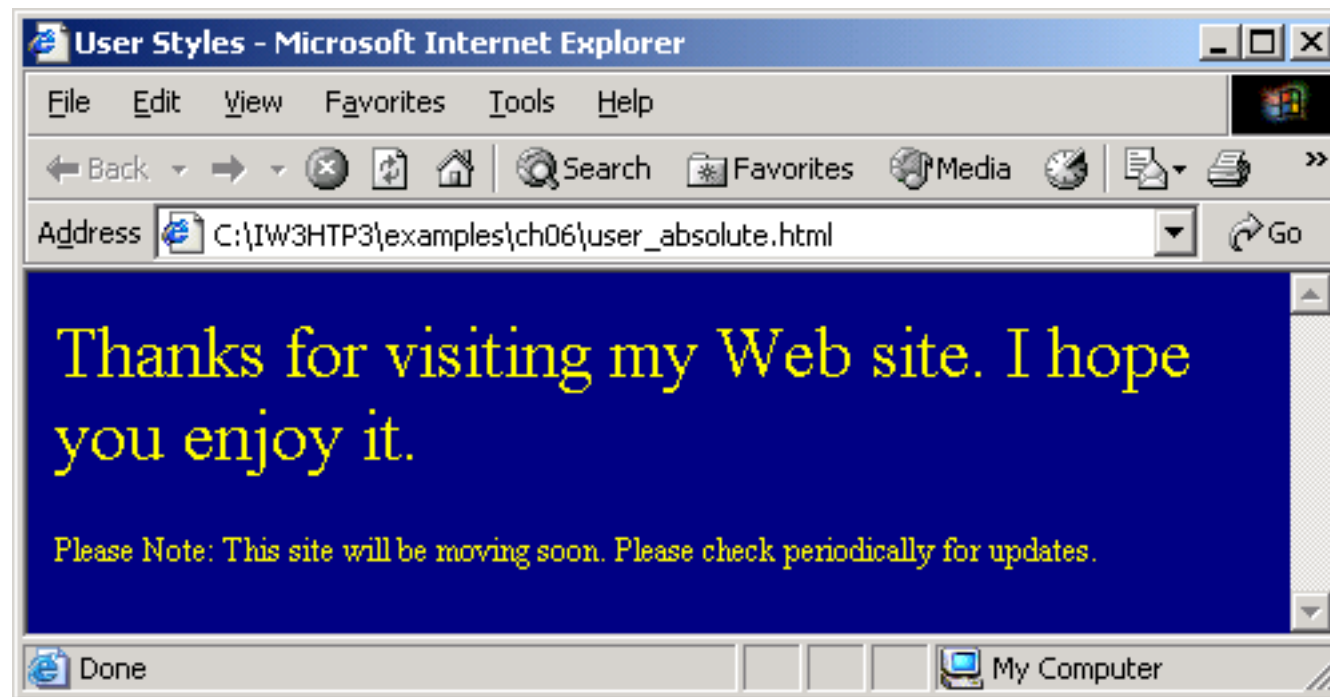


Fig. 6.18 User style sheet in Internet Explorer 6.

User Style Sheets

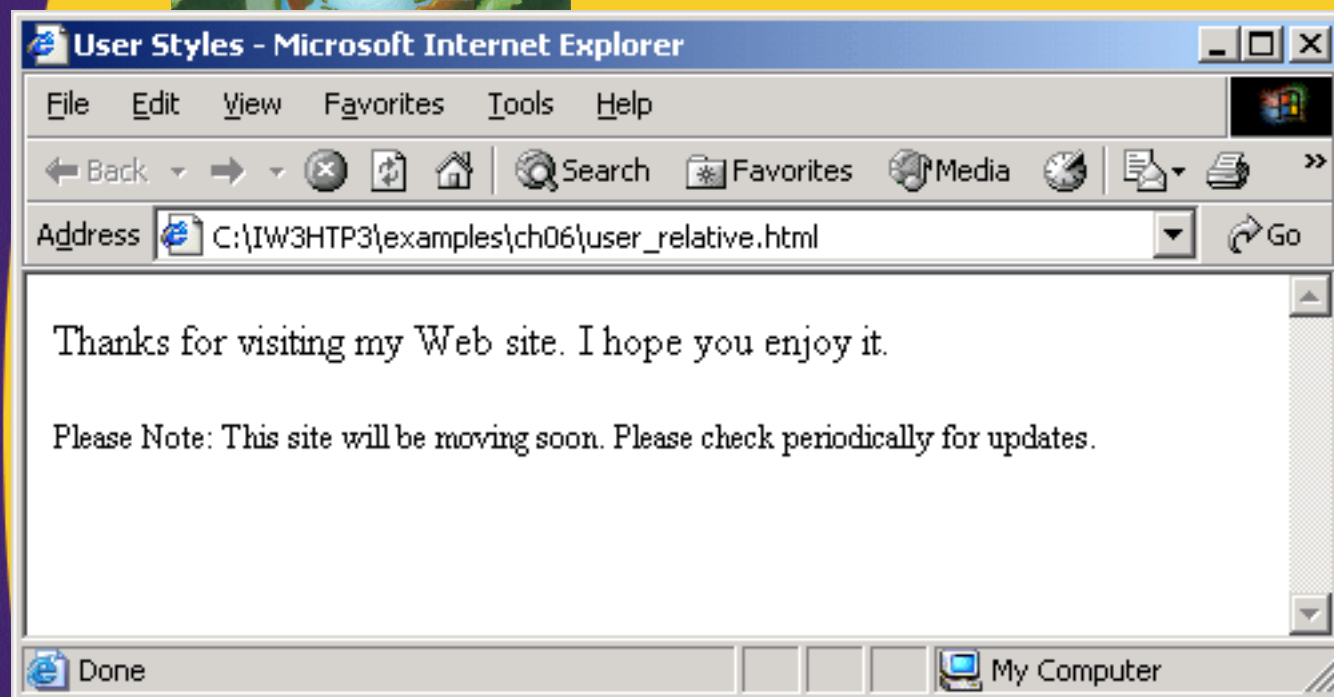



```
1 <?xml version = "1.0"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
3     "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
4
5 <!-- Fig. 6.20: user_relative.html -->
6 <!-- User styles -->
7
8 <html xmlns = "http://www.w3.org/1999/xhtml">
9     <head>
10         <title>User Styles</title>
11
12         <style type = "text/css">
13
14             .note { font-size: .75em }
15
16         </style>
17     </head>
18
19     <body>
20
21         <p>Thanks for visiting my web site. I hope you enjoy it.
22         </p><p class = "note">Please Note: This site will be
23         moving soon. Please check periodically for updates.</p>
```

24

25 </body>

26 </html>



User Style Sheets

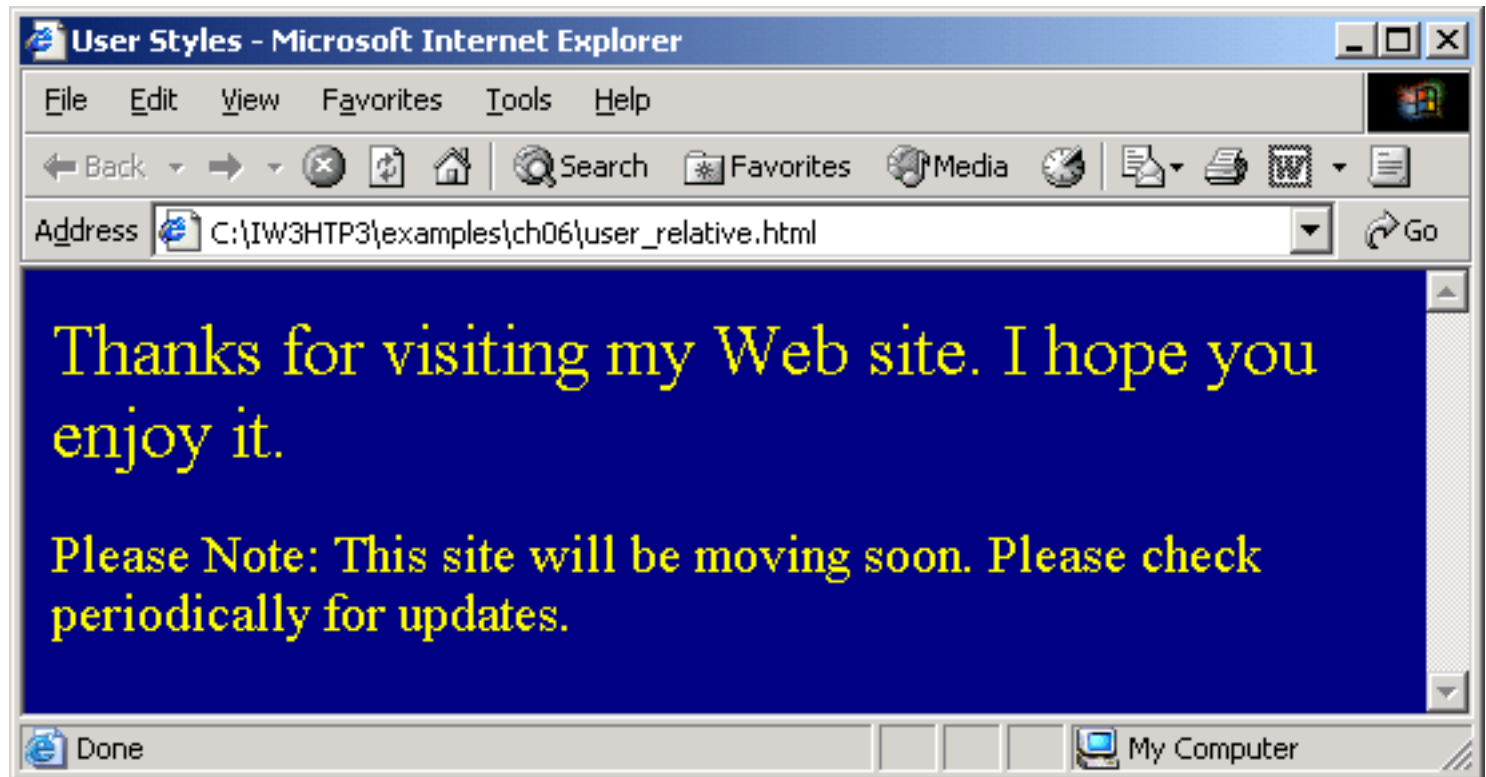


Fig. 6.21 User style sheet applied with em measurement.

Homework

1. Read and test all examples in chapter 5 of the book: “Core web programming”
2. Refer chapter 3 in VN-book!
3. refer:
https://www.w3schools.com/css/css_howto.asp