



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ

Εισαγωγή στην Επιστήμη και Τεχνολογία των Υπηρεσιών

Ενότητα 10: Cascading Style Sheets for XML

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Τμήμα Επιστήμης Υπολογιστών



Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο



ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ & ΘΡΗΣΚΕΥΜΑΤΩΝ, ΠΟΛΙΤΙΣΜΟΥ & ΑΘΛΗΤΙΣΜΟΥ
ΕΙΔΙΚΗ ΥΠΗΡΕΣΙΑ ΔΙΑΧΕΙΡΙΣΗΣ

Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης



ΕΥΡΩΠΑΪΚΟ ΚΟΙΝΩΝΙΚΟ ΤΑΜΕΙΟ

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XML
Cascading Style Sheets for XML
635.444

David Silberberg
Lecture 11

Cascading Style Sheets and XML

- Cascading Style Sheets in XML and HTML are very similar
- Used for the **presentation** of XML information
- Most of CSS in HTML can be applied to XML
- Differences
 - **style** attribute
 - **class** attribute
 - no special meaning for <STYLE> tag in XML
 - no special meaning for <LINK> tag in XML

External Style Sheets in XML

- Specified by:
 - `<?xml-stylesheet type=mimetype href=stylesheetURL?>`
- Very similar to `<LINK>` in HTML
- Mimetype
 - Can reference any stylesheet language that browser supports
 - Most likely will be:
 - text/css - for cascading stylesheets
 - text/xsl - for the Extensible Stylesheet language
- Must occur after `<?xml version="1.0" ...?>`
- Must occur before the first XML document element

Tables for XML

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/css"
  href="table1.css"?>
<Bank>
  <BankTable>
    <BankRow>
      <LastName>Smith</LastName>
      <FirstName>David</FirstName>
      <SSN>111-11-1111</SSN>
    </BankRow>
    <BankRow>
      <LastName>Jones</LastName>
      <FirstName>Fred</FirstName>
      <SSN>111-11-1112</SSN>
    </BankRow>
```

```
<BankRow>
  <LastName>Moore</LastName>
  <FirstName>Roger</FirstName>
  <SSN>111-11-1113</SSN>
</BankRow>
<BankRow>
  <LastName>Harris</LastName>
  <FirstName>John</FirstName>
  <SSN>111-11-1114</SSN>
</BankRow>
</BankTable>
</Bank>
```

Tables for XML - CSS

```
<!-- table1.css -->
```

```
Bank { } <!-- don't ask me why -->
```

```
Bank {background-color:green;display:inline-table}
```

```
BankTable {display:table-row-group;}
```

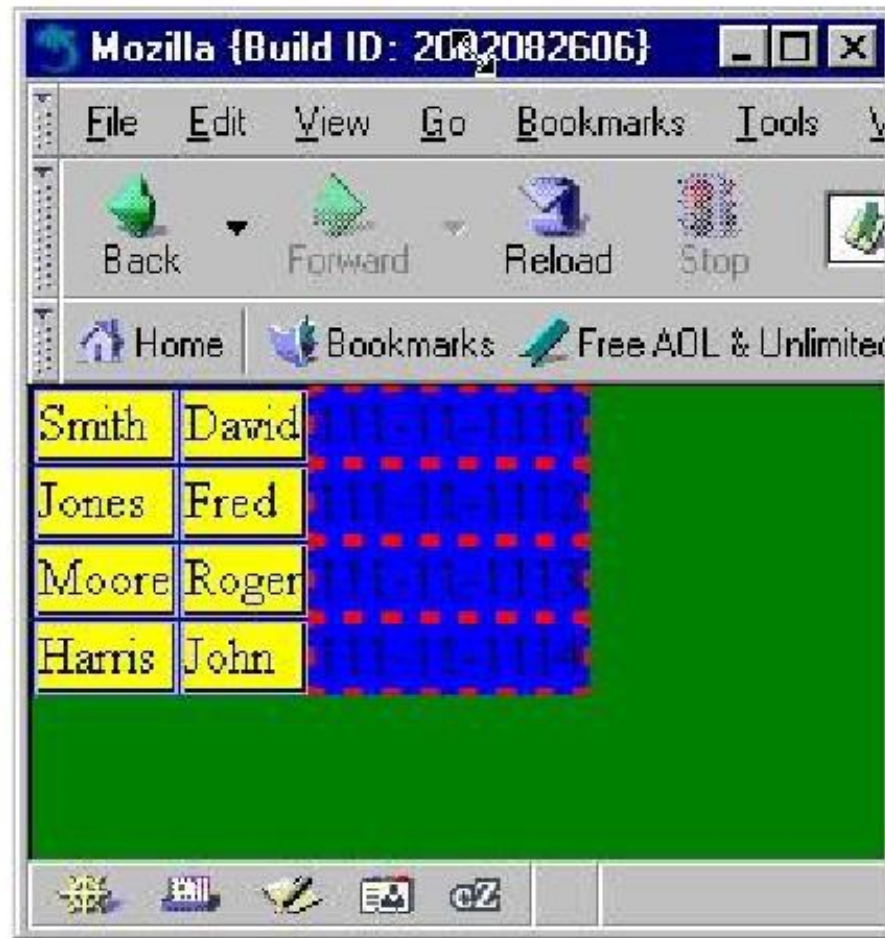
```
BankRow {display:table-row;}
```

```
LastName {display:table-cell;border:groove 2px blue;background:yellow}
```

```
FirstName {display:table-cell;border:groove 2px blue;  
            background:yellow}
```

```
SSN {display:table-cell;border:dashed 2px red;background:blue}
```


Table Result



Lists

- Outer layer of list is generally a block
- List items are displayed as „list-items“
- Example:

```
<customer_list>
  <customer>
    <lname>Jones</lname>
    <fname>Mark</fname>
    <ssn>111-22-3333</ssn>
  </customer>
  <customer>
    <lname>Sudarsen</lname>
    <fname>Pradip</fname>
    <ssn>777-22-5555</ssn>
  </customer>
</customer_list>
```

List Properties

```
<!-- list.css -->
```

```
customer_list {display:block; }
```

```
customer {display:list-item; list-style-type:circle; margin-left:5% }
```

```
lname {display:inline; font-size:14pt; color:navy;}
```


```
fname {display:inline; font-size:14pt; color:red;}
```

```
ssn {display: none}
```

List Display



List Style Type

- **list-style-type** possible values
 - **disc** - unordered disc bullet character
 - **circle** - unordered circle bullet character
 - **square** - unordered diamond bullet character
 - **decimal** - 1, 2, 3, ...
 - **decimal-leading-zero** - 01, 02, ..., 10, 11, 12, ..., 99
 - **lower-roman** - i, ii, iii, iv, ...
 - **upper-roman** - I, II, III, IV, ...
 - **lower-greek** - ...
 - **lower-alpha** - a, b, c, ...
 - **upper-alpha** - A, B, C, ...

List Style Image and Position

- **list-style-image** displays the graphical bullet
 - This is a URL image
 - bullet {list-style-image:url(images/mybullet.gif);}
- **list-style-position** determines how text is placed with respect to a bullet
 - **inside** - lines up with bullet
 - **outside** - lines up with text

■ This list element lines up with the text
which is considered **outside**

■ This list element lines up with the bullet
which is considered **inside**

Display Properties

- XML assumes that everything is displayed **inline** unless otherwise stated.
 - Things displayed **inline** are displayed as a continuation of a line of text.
 - Otherwise, displays must be specified as **block**
- Properties
 - **inline** - smallest possible size flowing automatically in the line
 - **block** - fills the flow area and starts as a new flow region
 - **none** - contents are not displayed
 - **list-item** - enables lists to be displayed
 - **run-in** - belongs to next block of text encountered - good for definitions
 - **compact** - occupies the smallest possible area in a box
 - **marker** - contents are treated as a marker or bullet

Visibility Properties

- Visibility is similar to display
- However, far less useful
- { visibility:visible; }
 - Renders element in a bounding box
- { visibility:hidden; }
 - Element not rendered in a bounding box
 - However, sets aside space for the element
 - Accepts mouse clicks (not like display:hidden)

Classes in XML

- Classes in HTML

- Used to define styles for predefined HTML tags
- HTML tags define part of document
- Classes define how HTML tags are to be displayed

- XML

- There are no pre-defined XML tags
- There is no need for a class since you can define an XML tag to be whatever you want
- Therefore, the „dot“ notation for classes is not necessary in XML

Example HTML Class Document

```
<HTML>
<HEAD> Cascading Class Example</HEAD>
<STYLE>
    .OK {background-color: green}
    .warning {background-color: yellow}
    .error {background-color: red}
</STYLE>
<BODY>
<H1 class="OK">Compiler Output: </H1>
<P class="error"> 2 errors
<DIV class="warning"> 1 warning </DIV>
<OL>
<LI class="error">error: line 25: syntax error after colon (:)</LI>
<LI class="error">error: line 35: invalid use of reserved word: int</LI>
<LI class="warning">warning: line22: variable „time“ may not be initialized.</LI>
</OL>
</BODY>
</HTML>
```

Example XML Classless Document

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/css" href="compiler1.css"?>
<Document>
  <Pagehead> Cascading Class Example</Pagehead>
  <OKTitle> Compiler Output: </OKTitle >
  <Error> 2 errors</Error>
  <Warning> 1 warning </Warning>
  <ErrorList>
    <ErrorItem>error: line 25: syntax error after colon (:)</ErrorItem >
    <ErrorItem>error: line 35: invalid use of reserved word: int</ErrorItem >
    <WarningItem>warning: line22: variable „time“ may not be
      initialized.</WarningItem>
  </ErrorList >
</Document>
```

XML Stylesheet Definition

```
<!-- compiler1.css -->
```

```
Pagehead {font-size:12pt; font-weight: bold; display:block}
```

```
OKTitle {font-size:14pt; font-weight: bold;background-color:green}
```

```
Error {background-color:red}
```

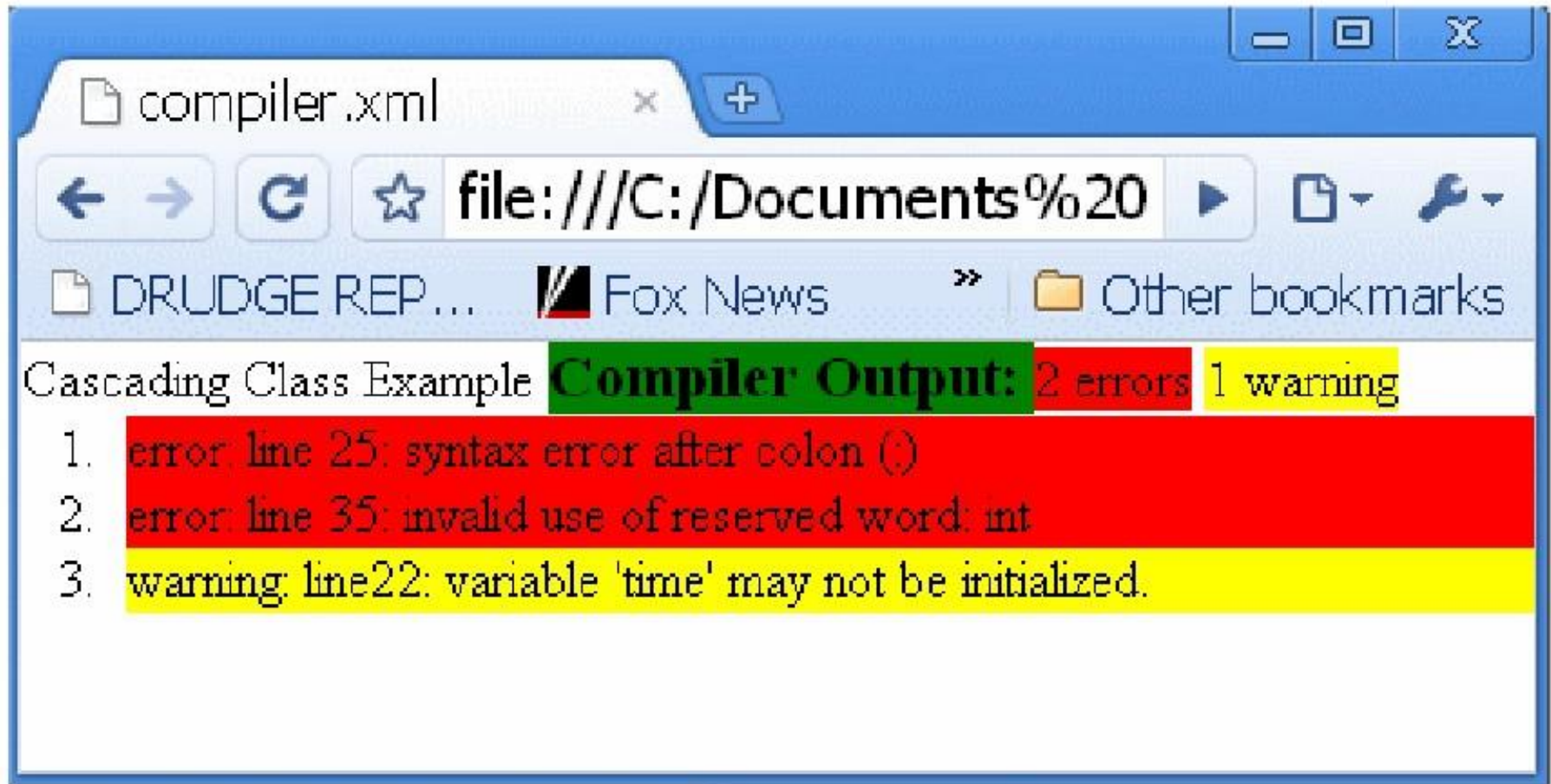
```
Warning {background-color:yellow}
```

```
ErrorList {display:block;visibility:visible;}
```

```
ErrorItem {display:list-item; list-style-type:decimal; margin-left:2em;  
            background-color:red}
```

```
WarningItem {display:list-item; list-style-type:decimal; margin-left:2em;  
             background-color:yellow}
```

Result Display



XML Style Sheet Attributes

- XML Style Sheets enable the definition of certain tag displays
- XML Style Sheets also enable the definition of tag types
- Example style sheet:

```
<!-- compiler2.css -->
```

```
Error { color: black; background-color:red }
```

```
Error [type="listitem"] { display:list-item; list-style-type:decimal }
```

- Example XML document

```
<Error> 2 errors</Error>
```

```
<ErrorList>
```

```
  <Error type="listitem">error: line 25: syntax error after colon (:)</ErrorItem >
```

```
</ErrorList >
```

Multiple Attributes

- XML style sheets permit multiple attributes per XML tag
- Example style sheet:

```
<!-- compiler3.css -->
```

```
Error { color: black; background-color:red }
```

```
Error [type="listitem"] { display:list-item; list-style-type:decimal }
```

```
Error [type="listitem"] [rank="high"] { font-weight:bold; }
```

- Example XML document excerpt:

```
<Error> 2 errors</Error>
```

```
<ErrorList>
```

```
  <Error type="listitem">
```

```
    error: line 25: syntax error after colon (:)</Error>
```

```
  <Error type="listitem" rank="high">
```

```
    error: line 35: invalid use of reserved word: int</Error>
```

```
</ErrorList >
```

XML Tag Inheritance

- Tag displays can vary according to their hierarchy
- CSS2 enables the definition of a tag display for a hierarchy
- Example:

```
<!-- Error tag at the first level below the Document tag -->
```

```
Document>Error {color: black; background-color:red}
```

```
<!-- Error tag at the first level below the ErrorList tag -->
```

```
ErrorList>Error {display:list-item; list-style-type:decimal;
```

```
color: black; background-color:red}
```


Example XML Inheritance Document

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/css" href="compiler2.css"?>
<Document>
  <Pagehead> Cascading Class Example</Pagehead>
  <OKTitle> Compiler Output: </OKTitle >
  <Error> 2 errors </Error>
  <Warning> 1 warning</Warning>
  <ErrorList>
    <Error>
      error: line 25: syntax error after colon (:)
    </Error>
    <Error>
      error: line 35: invalid use of reserved word: int
    </Error>
    <Warning>
      warning: line22: variable &lt;time&gt; may not be initialized.
    </Warning>
  </ErrorList>
</Document>
```

XML Inheritance Definition

```
<!-- compiler2.css -->
```

```
Pagehead {font-size:12pt; font-weight:bold; display:block}
```

```
OKTitle {font-size:14pt; font-weight:bold; background-color:green;  
         display:block}
```

```
Document>Error {background-color:red}
```

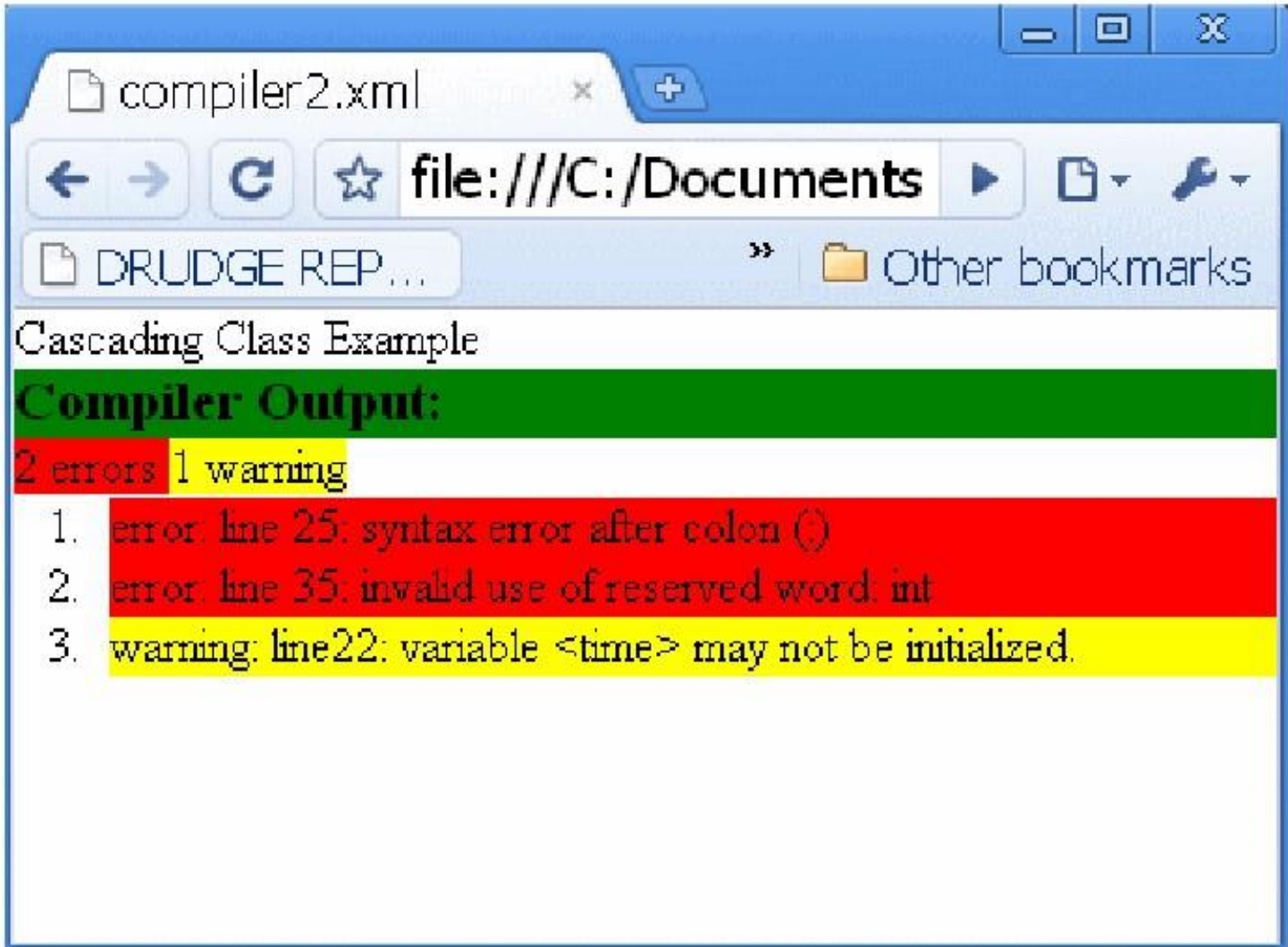
```
Document>Warning {background-color:yellow}
```

```
ErrorList {display:inline;visibility:visible;}
```

```
ErrorList>Error {display:list-item; list-style-type:decimal;  
                margin-left:2em; background-color:red}
```

```
ErrorList>Warning {display:list-item; list-style-type:decimal;  
                  margin-left:2em; background-color:yellow}
```

XML Inheritance Example Output



Multi-Level Inheritance

- Inheritance can be defined for any level of depth
- The syntax is similar to XML
- Example:

```
<!-- Error tag at any level below the Document tag -->
```

```
Document Error {background-color:red}
```

```
<!-- Warning tag at any level below the Document tag -->
```

```
Document Warning {background-color:yellow}
```

Internal Style Sheets

- Style Sheets may be referenced within a document
- Internal reference symbol # must be used
- Works similarly to the HTML anchor tag (A) for defining another location in a document

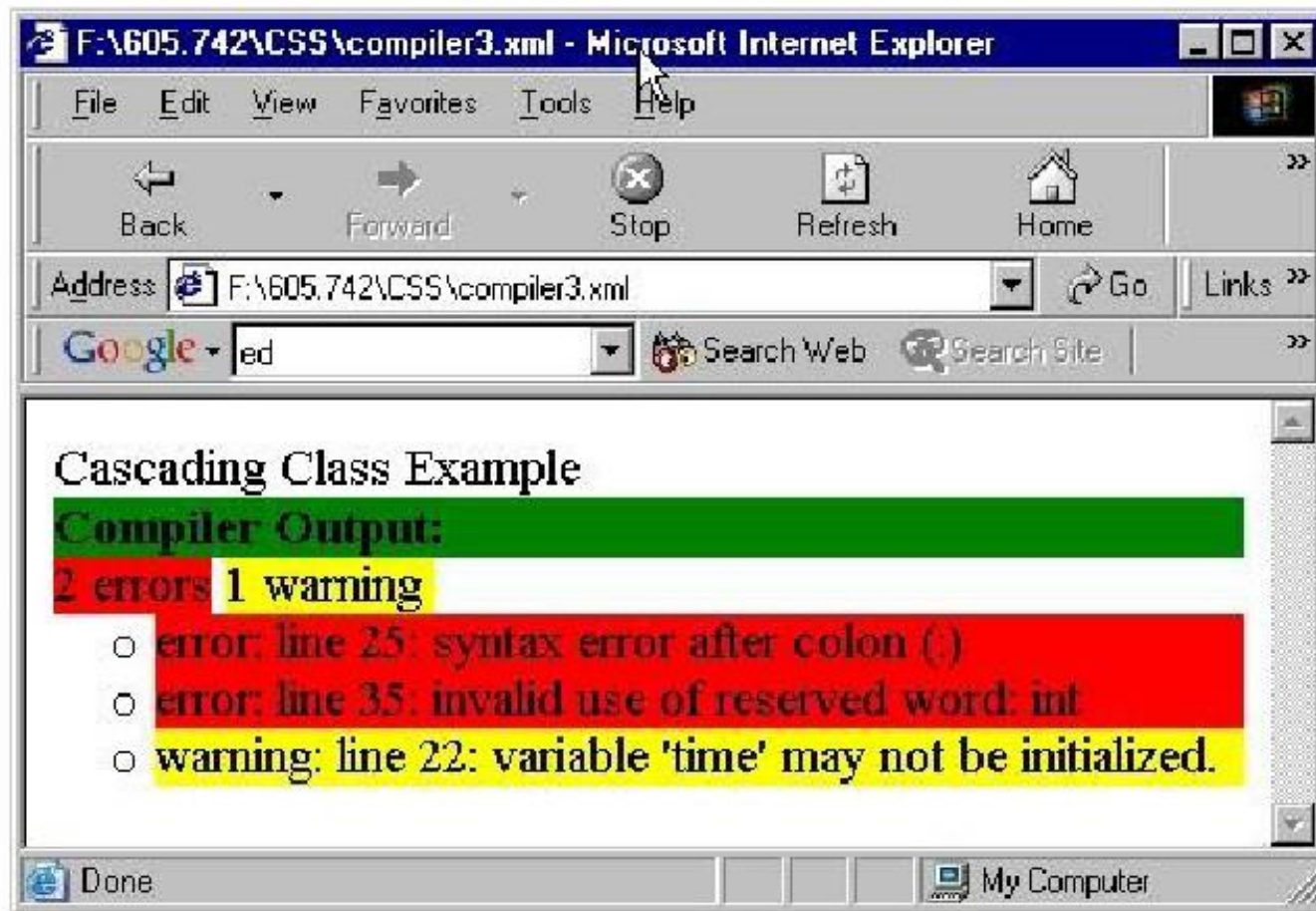
Internal Style Sheet Example

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/css" href="#sref"?>
<Document>
  <style id="#sref">
    Pagehead { font-size:12pt; font-weight: bold; white-space:pre; display:block }
    OKTitle { font-size:14pt; font-weight: bold; background-color:green; white-space: pre;
              display:block }
    Error { background-color:red;white-space: pre;}
    Warning { background-color:yellow;white-space: pre;}
    ErrorList { display:block;visibility:visible;}
    ErrorItem { display:list-item; list-style-type:circle;
                margin-left:2em; background-color:red;}
    WarningItem { display:list-item; list-style-type:circle;
                  margin-left:2em; background-color:yellow;}
    style { display:none;}           <!-- don't display the style block -->
  </style>
```

Internal Style Sheet Example (cont.)

```
<Pagehead> Cascading Class Example</Pagehead>
<OKTitle> Compiler Output: </OKTitle >
<Error> 2 errors</Error>
<Warning> 1 warning </Warning>
<ErrorList>
  <ErrorItem>
    error: line 25: syntax error after colon (:)
  </ErrorItem >
  <ErrorItem>
    error: line 35: invalid use of reserved word: int
  </ErrorItem >
  <WarningItem>
    warning: line 22: variable 'time' may not be initialized.
  </WarningItem>
</ErrorList >
</Document>
```

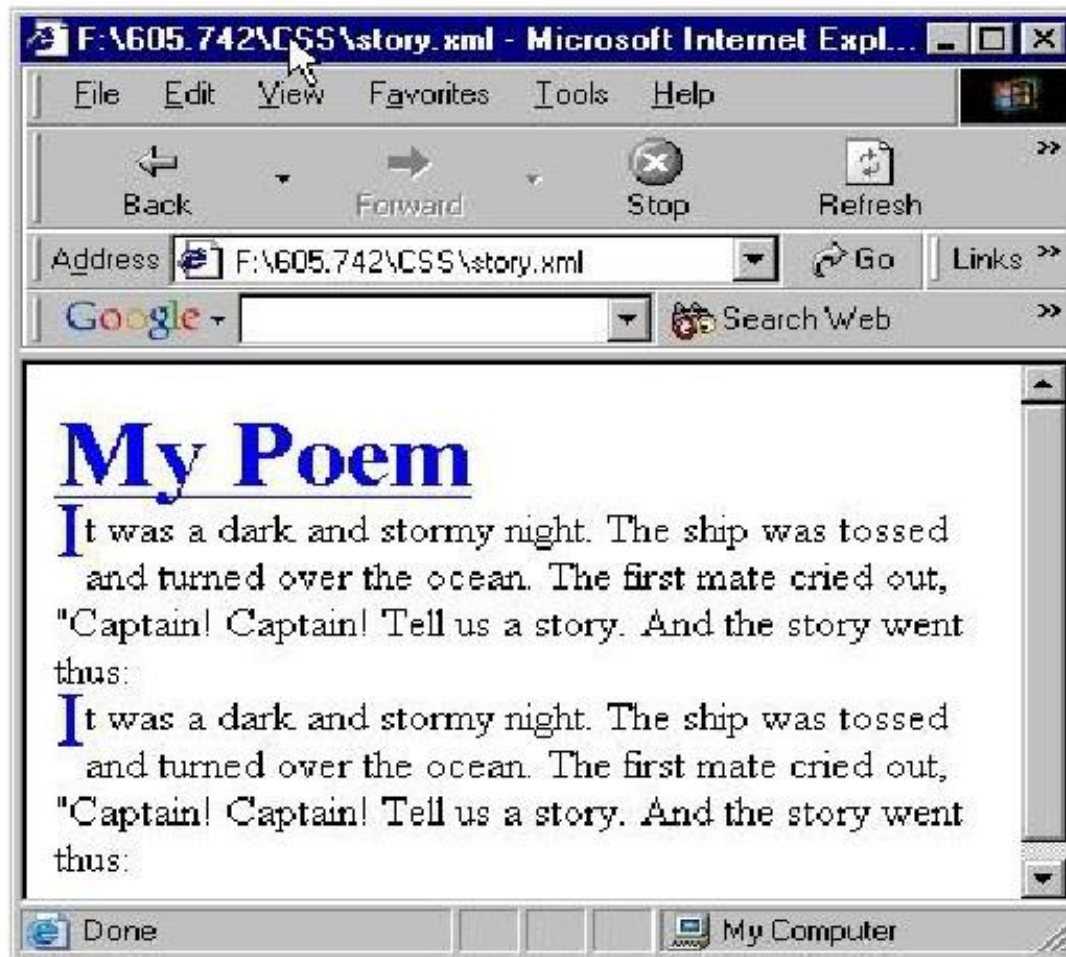
Internal Style Sheet Output



Internal Style Sheet Example 2

```
<?xml-stylesheet type="text/css" href="#internalStyleSheet"?>
<document>
  <st id="internalStyleSheet">
    <!-- internal stylesheet -->
      Header {display:block; font-size:28pt; font-weight:bold; color:blue; text-decoration: underline}
      P {font-size:12pt; color:black; display:block}
      P:first-letter {float:left; font-size:24pt; color:blue}
      st {display:none}
  </st>
  <Header>My Poem</Header>
  <P>It was a dark and stormy night. The ship was tossed and turned over
the ocean. The first mate cried out, "Captain! Captain! Tell us a story.
And the story went thus: </P>
  <P>It was a dark and stormy night. The ship was tossed and turned over
the ocean. The first mate cried out, "Captain! Captain! Tell us a story.
And the story went thus: </P>
</document>
```

Internal Style Sheet Example Output



Media Specifications

- Web pages are not the only use for XML
- CSS2 allows the same XML file to be displayed differently based on the medium
- Media types:
 - **all** - properties apply to all media
 - **aural** - for speech synthesizers
 - **braille** - for Braille devices
 - **embossed** - for Braille printers
 - **handheld** - for handheld devices with small screens or limited bandwidth
 - **print** - for printers
 - **projection** - for projection devices
 - **screen** - for color computer monitors
 - **tty** - for fixed pitch printers or teletypes, etc.
 - **tv** - for television

Media Directives

```
<!-- mediafile.css -->
```

```
@media screen, print {
```

```
    Title {font-weight: bold; font-size:14pt}
```

```
    P {font-size:12pt}
```

```
    Comment {font-size: 10pt; color: gray;}
```

```
}
```

```
@media aural {
```

```
    Title {volume: loud; }
```

```
    P {volume: medium; }
```

```
    Comment {volume:soft;}
```

```
}
```

Media Groups

- Used when characteristics, not device, is known
- **continuous** - one long string of output (e.g., aural, screen)
- **paged** - broken into discreet pages (e.g., print)
- **visual** - visual display (e.g., screen, print)
- **aural** - aural display (e.g., aural)
- **tactile** - tactile display (e.g., Braille)
- **grid** - fixed width set of characters (e.g, tty)
- **bitmap** - bitmap display (e.g., screen)
- **interactive** - media allows interaction (e.g., screen)
- **static** - no interaction (e.g., print, tty)
- **all** - all media types

Aural Style Sheets

- In general, there are many types of media that the Web is integrating and will integrate in the future
- Aural styles are useful in a number of applications
 - Automobiles or other environments where ones vision cannot be focused on a monitor
 - Automated telephone applications
 - Sites that can be accessed by people with poor or no eyesight
 - Museum tours
 - Information booths
- This area is in its infancy and is not as well developed as others

Aural Style Sheets Properties

- volume

- The average volume of the presentation

- number */* absolute value of the volume */*

- percentage */* range from 0% to 100% of possible aural comfort levels */*

- silent

- x-soft

- soft

- medium

- loud

- x-loud

- HUSH { volume: x-soft }

Aural Style Sheets Properties (cont.)

- speech-rate

- rate of speech at which the text is spoken
- ranges from slow (80 wpm) to x-fast (500wpm)
- x-slow /* 80wpm */
- slow /* 120wpm */
- medium /* 180-200wpm */
- fast /* 300wpm */
- x-fast /* 500wpm */
- faster /* adds 40wpm */
- slower /* subtracts 40wpm */
- AD_DISCLAIMER {speech-rate: x-fast }

Aural Style Sheets Properties (cont.)

- voice-family
 - Sort of like font-family
 - male
 - female
 - child
 - custom - can create custom voice families
 - valley-girl
 - surfer-dude
 - robot
 - COOL {voice: gen-x;}

Aural Style Sheets Properties (cont.)

- pitch

- Frequency of the speech
- (number) [Hz | kHz]
- SQUEAKY {pitch: 225Hz }

- pitch-range

- Range of the pitch - from 0 (completely flat like a robot) to 100 for a full range of speech
- 0 - 100
- BORING {pitch-range:15 }

Aural Style Sheets Properties (cont.)

- azimuth

- Direction that voice is coming to you

- -360deg - 360deg /* 0deg - in front of you,
90deg - to your right, etc. */

- left-side /* 270deg - with behind (270deg) */

- far-left /* 300deg - with behind (240deg) */

- left /* 320deg - with behind (220deg) */

- center-left /* 340deg - with behind (200deg) */

- center /* to your front (0deg) */

- center-right /* 20deg - with behind (160deg) */

- right /* 40deg - with behind (140deg) */

- far-right /* 60deg - with behind (120deg) */

Aural Style Sheets Properties (cont.)

- azimuth (cont.)

- right-size /* 90deg - with behind (90deg) */
- leftwards /* subtracts 20deg from current angle */
- rightwards /* adds 20deg from current angle */
- CRASH {azimuth: center-left; }
- SCREAM {azimuth: center-right behind; }

Aural Style Sheets Properties (cont.)

- pause-after
 - Pauses after a given piece of text
 - seconds or milliseconds
 - percentage of average word - if rate of speech is 120wpm then a word is said in one half second. Thus, if pause-after is set to 25%, then the pause is 1/8 sec.
 - INTRODUCTION {pause-after: 200ms; }
- pause-before
 - Pauses before a given piece of text
 - seconds or milliseconds
 - percentage of average word
 - PUNCHLINE {speech-rate: x-slow; pause-before: 200;}

Aural Style Sheets Properties (cont.)

- pause
 - Pauses both before and after text
 - seconds or milliseconds
 - percentage of average word
 - MEASURED {pause: 1sec;}
 - STACCATO {pause: 200ms 800ms;}
 - equivalent to:
 - STACCATO {pause-before: 200ms; pause-after: 800ms;}

Aural Style Sheets Properties (cont.)

- cue-before
 - Lets sound file play before selection begins
 - url
 - ANSWER {cue-before:url(drum-roll.au); }
- cue-after
 - Lets sound file play after selection ends
 - url
 - THE-END {cue-after:url(tada.au); }
- cue
 - Lets sound file play before and after selection
 - TV-SHOW {cue:url(theme-song.au); }

Aural Style Sheets Properties (cont.)

- play-during
 - Plays the selection in the background as the text is read
 - (url) - sound is played in the background while the text is spoken
 - mix - sound inherited from the parent's „play-during“ file continues to play with this sound is mixed in. Without „mix“, sound replaces parents sound.
 - repeat - sound repeats if too short to fill the duration. Otherwise, it plays once
 - auto - sound continues to play without restarting
 - none - parent sound is silent until done with current text. Then, the parent sound continues.
 - NARRATOR {play-during:url(intro-words.au) mix;}

Aural Style Sheet Example

```
@media visual {
  title {text-shadow: 3px 3px 5px red ; font-size:16pt; text-align: center; color:
    blue}
  introduction {font-size:12pt; color: black; font-style: italic;}
  text {font-size: 12pt; color: black}
  scary {font-size: 12pt; color: blue; font-style: italic; font-weight: bold; }
  end {font-size: 12pt; color: black} }

@media aural {
  title {voice-family: creature-features; volume: soft; cue-after:url(theme.au);}
  introduction {volume:medium; speech-rate:slow; pitch: 100Hz}
  text {voice-family: „Darth Vader“; pitch-range: 35}
  scary { volume: loud; play-during:url(scream.au); azimuth: right-center
    behind; }
  end {pause:3sec; }
```

Τέλος Ενότητας



Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο



Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης

