"Politehnica" University of Timisoara

Advanced Web Programming

C2. Basic Web Technologies

HTML

- Originally developed by Tim Berners-Lee in 1990 at CERN (Conseil Européen pour la Recherche Nucléaire)
- Supported by the NCSA Mosaic browser
- Should work well across different browsers and platforms
- Several versions: HTML 1, 2, 3, 4
- HTML 5 is currently under development

HTML 4

- HTML 4 (1997) extends HTML 3 with:
  - Style sheets (CSS)
  - Scripting (<script type="text/javascript>)
  - Frames (<frameset>, <frame>)
  - Embedding objects (<object>, e.g. Flash)
  - Mixed direction text (e.g. Arabic or Hebrew)
  - Richer tables (<tbody>, <colgroup>)

HTML 4. Accessibility

- Better distinction between document structure and presentation (using style sheets)
- Better forms, including the addition of access keys, semantic grouping, active labels
- A new client-side image map mechanism
- Support for the title and lang attributes on all elements, internalization features
- Better tables, including captions, column groups, and mechanisms to facilitate non-visual rendering (e.g. speech synthesizers)

HTML 4 Validation

- Validate the Web page against standard
  - http://validator.w3.org/
  - http://www.htmlhelp.com/tools/validator/
- The version of HTML against which the document is validated is based on the DOCTYPE information

<DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">

HTML DocType

- Doctype – specify the version of ML used
  - Strict
    - contains all HTML elements and attributes, but does NOT INCLUDE presentational or deprecated elements (e.g. font). Framesets are not allowed
  - Transitional
    - contains all HTML elements and attributes, INCLUDING presentational and deprecated elements. Framesets are not allowed
  - HTML 4.01 Frameset
    - as Transitional, but allows the use of frameset content

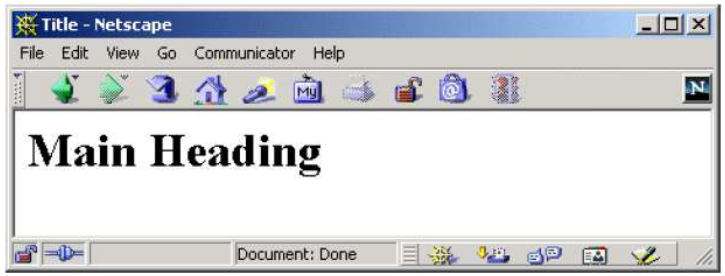
HTML Document Structure

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
  <TITLE>Title</TITLE>
</HEAD>

<BODY>
<H1>Main Heading</H1>

<!-- Rest of page goes here -->

</BODY>
</HTML>
```

Goes on browser's title bar
May not appear in printouts

Main heading. Often used as title
Appears in printouts

HTML comment
Replace with body of
WWW page



HEAD Elements

- TITLE – goes on browser's title bar
- BASE – base URL or default target
- META – meta information for robots
- BGSOUND – background sounds
- SCRIPT / NOSCRIPT – scripting/ alternative code/error message
- STYLE – add styles (CSS)

META Elements

- Records document information
  - Name = “author”
  - Name = “keywords”
  - Name = “description”
- Refresh or forward the page
  - HTTP-EQUIV = “refresh”
  - Contents = “milliseconds”
  - URL=“auto-forward target”

BODY Elements

- BGCOLOR – background color of the page
- BACKGROUND – background picture
- TEXT – color of the text on the page
- LINK – color of links not followed yet
- VLINK – color of links that have been followed
- ALINK – color of links while you are clicking on them
- BGPROPERTIES - if the background image should not scroll (BGPROPERTIES=FIXED)

Font Elements

- <FONT>
  - SIZE – size of the font (ex. SIZE=4)
  - COLOR – color of the text (ex. COLOR="#FF3399")
  - FACE – typestyle (ex. FACE="Arial")
  - WEIGHT – thickness (ex. WEIGHT="900")
- <TT>/<PRE> – teletype (fixed width)
- <SUB> – subscript
- <SUP> – superscript

Text Elements

- <STRIKE>/<S> – strikeout
- <U> – underline
- <B> – bold
- <I> – italics
- <BIG> – bigger than normal
- <SMALL> – smaller than normal
- <BLINK> – causes the text to blink

Text Structural Elements

- <P> – paragraph
  - ALIGN – alignment of text within the paragraph (left , center , right , justify)
-
 – line break
- <CENTER> – a section that is centered
- <HR> – horizontal rule
  - SIZE – height, WIDTH - width of the line
  - COLOR – color of the line
- <H1>…<H6> – headings

Special characters

Desired character	HTML code
<	&lt;
>	&gt;
&	&amp;
“	&quot;
Space	

Lists Elements

- <OL> – ordered list
  - TYPE - type of numerals (1, A, a, I, i)
  - START - where to start counting
- <UL> – unordered list
  - TYPE - type of bullets (DISC, CIRCLE, SQUARE)
- <LI> – list item

Special lists

- <DL> – definition list
  - COMPACT - take up less space
- <DT> – definition term
- <DD> – definition description

- <DIR> – directory list (use <UL> instead)

Image Elements

- <IMG> – external image
  - SRC - where to get the picture
  - ALT - text to show if you don't show the picture
  - WIDTH - how wide is the picture
  - HEIGHT - how tall is the picture
  - ALIGN - how text should flow around the picture
  - BORDER - border around the picture
  - HSPACE - horizontal distance between the picture and the text
  - VSPACE - vertical distance between the picture and the text
  - ISMAP - is this a clickable map?

TABLE Attributes

- <TABLE> – create a table
  - WIDTH - width of the table as a whole
  - HEIGHT - height of the table as a whole
  - BORDER - size of border around the table
  - BORDERCOLOR - color of border around the table
  - BGCOLOR - color of the background
  - BACKGROUND - picture to use as background
  - CELLPADDING - space between the edge and the cell contents
  - CELLSPACING - space between cells

TABLE Elements

- <TR> - table row
- <TD> - table data
- <TH> - table header
- <COLGROUP> - column group with common properties
- <CAPTION> - table caption
- <THEAD> - table header section (group of rows)
- <TBODY> - table body section (group of rows)
- <TFOOT> - table footer section

TABLE Example

```
<TABLE CELLPADDING=6 RULES=GROUPS  FRAME=BOX>

<THEAD>
<TR> <TH>Weekday</TH> <TH>Date</TH> <TH>Manager</TH> <TH>Qty</TH> </TR>
</THEAD>

<TBODY>
<TR> <TD>Mon</TD> <TD>09/11</TD> <TD>Kelsey</TD>  <TD>639</TD>  </TR>
<TR> <TD>Tue</TD> <TD>09/12</TD> <TD>Lindsey</TD> <TD>596</TD>  </TR>
<TR> <TD>Wed</TD> <TD>09/13</TD> <TD>Randy</TD>   <TD>1135</TD> </TR>
<TR> <TD>Thu</TD> <TD>09/14</TD> <TD>Susan</TD>   <TD>1002</TD> </TR>
<TR> <TD>Fri</TD> <TD>09/15</TD> <TD>Randy</TD>   <TD>908</TD>  </TR>
<TR> <TD>Sat</TD> <TD>09/16</TD> <TD>Lindsey</TD> <TD>371</TD>  </TR>
<TR> <TD>Sun</TD> <TD>09/17</TD> <TD>Susan</TD>   <TD>272</TD>  </TR>
</TBODY>

<TFOOT>
<TR> <TH ALIGN=LEFT COLSPAN=3>Total</TH> <TH>4923</TH> </TR>
</TFOOT>

</TABLE>
```

Weekday	Date	Manager	Qty
Mon	09/11	Kelsey	639
Tue	09/12	Lindsey	596
Wed	09/13	Randy	1135
Thu	09/14	Susan	1002
Fri	09/15	Randy	908
Sat	09/16	Lindsey	371
Sun	09/17	Susan	272
Total			**4923**

Links

- <A> - link anchor
  - HREF - URL you are linking to
  - NAME - name a section of the page
  - TARGET - which window the document should go in
- <BASE> - base address. Any relative reference will be calculated from the URL given by it instead of the actual URL
  - HREF - default address for hypertext links
  - TARGET - default window for linked documents

Frames Elements

- <FRAMESET> - defines the general layout of a web page that uses frames
  - COLS/ROWS - how many cols/rows in the frameset
  - FRAMEBORDER: if the frames should have borders
  - FRAMESPACING: space between the frames
- <FRAME> - sets a single frame
  - SRC - what file to put in the frame
  - NAME - the name of the frame
- <NOFRAMES> - text for older browsers
- <IFRAME> - frame over a page (“floating”)

Forms Elements

- <FORM> - display an HTML form
  - ACTION - URL of a SSC or CGI program
  - METHOD - how to transfer the data to the server
- <INPUT> - creates a data entry field
- <TEXTAREA> - a form field for large text
- <SELECT> - a selectable list
- <OPTION> - an option inside a <select> list
- <BUTTON> - creates a button
- <LABEL> - a text associated with an element

HTML - ref

- HTML tutorial
  http://www.w3schools.com/html/default.asp

XHTML

- XHTML (eXtensible Hypertext Markup Language) - a family of XML languages developed to extend HTML
- The main goal: to make HTML more extensible and increase interoperability with other data formats through XML mechanisms
- Allows mixing of HTML code with other XML based languages like Scalable Vector Graphics (SVG) or MathML

XHTML versus HTML

- There are several differences between HTML and XHTML:
  - all elements (tags) has to be closed (incl. </input> or </br>)
  - XML is case-sensitive for element and attribute names
  - XML does not allowed attribute minimization (ex. <option selected="selected">)
  - behavior on parse errors differ (processing could be aborted)
  - support for namespaces
  - differences in JavaScript processing (ex. document.write() will not work in XHTML)
  - There are three different XHTML 1.0 corresponding to the three different versions of HTML 4 as: XHTML 1.0 Strict, XHTML 1.0 Transitional and XHTML 1.0 Frameset.

CSS

- CSS - Cascading Style Sheets is a language used to describe the appearance (the look and formatting) of a document written in a markup language (ex. HTML)
- The main objective was to enable the separation of document content from the document presentation
- CSS specifications are maintained by the W3C

CSS Syntax

- Three Ways to Insert CSS
  - External style sheet
  - Internal style sheet
  - Inline style
- Syntax: selector { propriety: value;… }
- Selectors
  - Element: p {color:red;}
  - Class: .redText {color:red;}
  - Id: #textC {text-align:center;}
  - Hierarchical: #bigTable td {text-align:left;}

CSS Solving Conflicts

```
<html>
<head>
   <style type="text/css">
              .red{
                     font-size:15px;
                     color:red;
              }
   </style>
   <title>Apple Example</title>
</head>
<body>
   <p class="red" style="color:green">Apple</p>
</body>
</html>
```

CSS Styling Text

```
color:           .. color.. | ..hex.. | ..rgb..
direction:       ltr | rtl
letter-spacing:  nomal | ..px..
word-spacing:    normal | ..px..
text-align:      left | right | center | justify
text-decoration: none | underline | line-through |
                 blink
text-ident:      ..px.. | %
text-transform:  none | capitalize | uppercase |
                 lowercase
white-space:     normal | pre | nowrap
```

CSS Styling Font

```
font-family:   ..font..
font-size:     % | ..px.. | ..pt.. | ..cm.. | ..em..
font-style:    normal | italic | obligue
font-variant:  normal | small-caps
font-weight:   normal | bold | bolder | lighter |
               100 – 900
line-height:   % | ..nr..
```

CSS Styling Lists and Tables

```
list-style-image: none | url
list-style-position: inside | outside
list-style-type: disc | circle | lower-greek | ..

border: size border-type color;
border-collapse: separate | collapse;
width: size;
height: size;
text-align: left | right | center;
padding: size;
color: color | rgb(r,g,b);
background-color: color | rgb(r,g,b);
```

CSS - ref

- CSS Tutorial
  http://www.w3schools.com/css/default.asp

- Free CSS Menu Editor
  http://purecssmenu.com/

HTML 5

- Next standard
- Some browsers offer some limited support
- Aims
  - Reduce the need for external plugins (like Flash)
  - Better error handling
  - More markup to replace scripting
  - Device independent (e.g. various mobile devices)

HTML 5 – New Features

- Some of the new features:
  - Canvas element - drawing
  - Video and audio elements - media playback
  - Better support for local offline storage
  - New content specific elements (article, footer, header, nav, section)
  - New form controls (calendar, date, time, email, url, search)

HTML 5 – New Media Tags

- <audio>
  - audio streams: sounds, music (mpeg4, ogg, WebM)
- <video>
  - video content: movie clips (mp3, ogg vorbis, wav)
- <source>
  - for media elements, defined inside video or audio elements
- <embed>
  - for embedded content, such as a plug-in
- <canvas>
  - runtime drawings with a script (e.g. javascript)

HTML 5 – Data Storage

- Two new objects for storing data on the client
  - localStorage - stores data with no time limit
  - sessionStorage - stores data for current session
- Data is not passed on by every server request, but used only when asked for. It is possible to store large amounts of data without affecting the website's performance
- The data is stored in different areas for different websites, and a website can only access data stored by itself
- JavaScript is used to store and access the data.

HTML 5 – Local Storage

- E.g. Page counter

```
<script type="text/javascript">
   if (localStorage.counter)
  {
     localStorage.counter=Number(localStorage.counter)+1;
   }
   else
  {
     localStorage.counter=1;
   }
   document.write("Visitor #"+localStorage.counter);
</script>
```

HTML5 - ref

- HTML5 Tutorial

  http://www.w3schools.com/html/html5_intro.asp

- W3C HTML5 Reference

  http://www.w3.org/TR/html5/