

Scientific Communication CITS7200

Computer Science & Software Engineering

Lecture 11

1 Writing a web page

The Internet provides an environment for hypertext documents to be accessed rapidly around the world. Many academics and students use this facility, and have created their own Home Pages as a way of providing an information resource and letting the world know about their work. An academic home page would typically include the title, name and position of the person, perhaps a photograph, contact information, information relating to the research and teaching (or class) activities of the person, and any other information the person wants to be made public. As its web address is a Uniform Resource Locator (URL), so the web page itself should be constructed as a *resource*. That is, web pages should be designed to be *client-focused*.

What makes a hypertext document hyper is its non-linear structure and the inclusion of non-textual information, such as images or audio. Hypertext documents are read by net browsers, such as Internet Explorer or Netscape.

Clicking onto the highlighted portions of a web document will open other resource files containing other information. How the document is read is entirely up to the reader; the writer has little control over the order in which material is accessed, other than by reverting to a straight text document.

1.1 History

The Web was first proposed in 1989 by Tim Lee, working at CERN and wishing to provide an environment for physicists to link up and share their work and data from around the world. The web browser for the X Window system, Mosaic, was released in 1993, and in 1994 a working group was set up to begin defining standards for the hypertext markup language, HTML.

1.2 HTML

HTML is the language in which most web documents have been written to date. It is a markup language similar to \LaTeX , and consists of plain text plus markup directives, called *tags*. Tag names are not case sensitive. HTML is an application of SGML—Standard Generalized Markup Language. In 1998 version 1.0 of XML—Extensible Markup Language— was developed. XML is a subset of SGML. XHTML is an application of XML.

An HTML document consists of a *head* and a *body*. The head contains information about the document, and the body contains the document's contents.

Document contents typically consist of paragraphs of text, lists of items, and hypertext links to other documents.

Here is an example of an HTML document containing the types of links and information that might typically be found on an academic home page.

The file is called `index.html` and is kept in a directory called `WWW`, which is a subdirectory of the top directory. These directories must be world executable, and all web files world readable. Comments in an HTML document are included in `<!-- . . . -->`.

```

<!-- This is the head of the document -->
<!DOCTYPE HTML SYSTEM "html.dtd">

<HTML>
<HEAD>
<!--The title appears right at the top of the browser-->
<TITLE>The Title of the Page</TITLE>

<!--META tags are used for various types of meta-information about the
document-->
<META NAME=' 'keywords' 'CONTENT=' 'your name, your university' '>
<META NAME=' 'description' 'CONTENT=' 'Personal home page of Your Name' '>
<!--This next command ensures that a fresh version of the page is loaded
each time. It is good to include if the page is likely to change
frequently-->
<META HTTP-EQUIV="Expires" CONTENT="Tue, 20 Aug 1996 14:25:27 GMT">
</HEAD>

<!-- This is the body of the document -->
<BODY>

<!-- This is a header with an image -->
<H1><IMG ALIGN=TOP SRC="pic.gif" ALT="Gif image of Something">
The Home Page of Your Name</H1>

<!-- Next comes a horizontal line -->
<HR>

<!-- A paragraph with hypertext links -->
<P>Your Name is Your Position at
<A HREF="http://www.youruniversity">Your University</A>. Some
more details might follow concerning your provenance or
other relevant information.</P>

<!-- A smaller header -->
<H2>Contact</H2>

<!-- An unordered list with hypertext links -->
<UL>
<LI> <A HREF="address.html">Addresses</A></LI>

```

```
<LI> <A HREF="mailto:yourname@youraddress">yourname@youraddress</A></LI>
</UL>
```

```
<H2>Teaching and Learning</H2>
```

```
<!--Insert some graphics or text about what you do,
either as a student or as a teacher, or both. Maybe this
can be done as thumbnails
that can be clicked to open up more information-->
```

```
<!--As done below, these will just appear as they fit in the browser.
For a better layout, see the section on Tables below-->
```

```
<a href='info1.html'><img src='info1.jpg' ALT='first stuff'>Whatever</a>
<a href='info2.html'><img src='info2.jpg' ALT='second stuff'>More Stuff</a>
<a href='info3.html'><img src='info3.jpg' ALT='third stuff'>And the Rest</a>
```

```
<H2>Research</H2>
```

```
<!--Another list, this time ordered, but for no particular reason-->
<OL>
<LI><A HREF="resproj.html">Research Projects</A></LI>
<LI><A HREF="papers.html">Publications</A></LI>
</OL>
```

```
<HR>
</BODY>
</HTML>
```

1.3 Including images in your document

Images can make your hypertext documents visually very exciting, but need to be used with care. If your document has too many images, or images with very high resolution, then they will be slow to fetch over the network. If you use other people's images in your document, be careful of any copyright issues. If you use an image, always use an ALT tag to give a text version of the image for visually disabled users to access the content.

Images are usually included with a command of the following style:

```
<IMG SRC='url' [ALT='description'] [ALIGN='spec']>
```

The term `url` refers to the Uniform Resource Locator (URL), or path, to the image file. The `ALT` attribute gives an alternative textual description of the image that can be used by browsers when operating in text-only mode. The `ALIGN` attribute can only take the values `TOP`, `MIDDLE`, or `BOTTOM`, and aligns at those places any text that comes with the image.

1.4 Tables

Tables can be used to layout information on the page. You can put graphics or text or any hypertext into the table as your table data.

The `<TABLE>` command invokes the environment, `<TR>` defines table rows, and `<TD>` defines the table data. You can also use `<CAPTION>` to give a table a caption.

Here's a (very!) simple example:

```
<TABLE>
<CAPTION>Some SciComm Students in 2001</CAPTION>

<TR>
<TD>Paul</TD>
<TD>Cindy</TD>
<TD>Chee</TD>
<TD>Julian</TD>
</TR>
<TR>
<TD>Jason</TD>
<TD>Xiang</TD>
<TD>Iris</TD>
<TD>Matthew</TD>
</TR>
<TR>
<TD>Sam</TD>
<TD>Robert</TD>
<TD>James</TD>
<TD>Edward</TD>
</TR>
</TABLE>
```

1.5 Design

This section covers a few of the points relating to design, as well as links to some of the many sites that are useful for web designers.

1.5.1 HTML

www.htmlgoodies.com is an excellent introductory site with many simple tutorials for getting started in HTML. From the start, you should aim to write well-structured HTML code, with opening and closing tags properly balanced, and internal documentation.

www.webmonkey.com has a list of HTML code snippets in cheat sheets, along with a page on ASCII colour codes for web-safe colours.

1.5.2 What to Include

It is essential to say

- Who you are
- What you do
- How you can be contacted

A simple and elegant example is given at www.boothhansen.com. Aim for your opening page to be simple and concise, with the option to click on to more detailed information at a deeper level.

1.5.3 Navigation

Navigation should be logical and sequential. The *3-click rule* states that you should be able to get to anywhere in the site in three or fewer clicks. The structure of the site should be easy to follow, meaning that every page should exhibit a visual consistency, with the same location of menus, buttons and information in each page.

Before you begin, draw a hierarchy or flow chart to design your site, ensuring that navigation links can get you from any part to any other part in three or fewer clicks.

1.5.4 Site Design

Each site should have a look that is consistent. This means that you should use the same colours and designs throughout. Use frames or tables to position elements on each page, and use the same, or consistent, positioning across the whole site. Limit colours to two or three at the maximum, and choose colours that go together well. Colour scale books are available in university libraries.

Before writing any code, go through a story-boarding exercise so that you have a design plan. Page size should be designed to a ratio of 2:3 for height:breath.

1.5.5 Backgrounds

There should be a high contrast between the background and text or images. Be wary of using red against green because colour-blind users cannot distinguish between these shades.

All text should be coded as text, because text is easier to read and clearer than graphics. Exceptions can be made for fancy headings. The default font is `arial`. The standard font size is 12pt.

Keep backgrounds simple. Plain backgrounds load quickly and give the best readability. Simple backgrounds can be created by tiling small patterns, but the background should never be busy.

Text downloads much faster than images, so make sure there is some text to read while the images are downloading.

Shorter pages are better, so use links to information rather than have long pages with scroll bars. As well, text that runs right across the screen is much more difficult to read than text that appears in small blocks.

1.5.6 Images

One large image loads much more quickly than several small ones. Use the `gif` format for line drawings, maps and other fine featured or detailed images, but note that `gif` only supports 256 colours. Use `jpg` for natural coloured images. Balance text with images and have no more than about 20k in images per page. A whole site should fit on to a single floppy disk if you want to be sure of a fast download time. Various compression routines are available in many design tools, such as Photoshop. Make sure that any images you include are the correct size at the point of insertion into the code; do not use your HTML code to resize images.

Be careful of copyright issues with regard to images. Either create your own images, or ensure you have the right to use those that belong to others.

`www.ratz.com/features.html` has a lists of **dos** and **don'ts** for web sites.

1.5.7 Menu

Limit the number of menu items you have on a page, and restrict each item to one or two words for the title. List similar items together, and use the same placement of menus throughout your site. `www.lynda.com` has a number of sample sites that illustrate good design principles.

1.5.8 Resolution and Browsers

Check your site at 640×480 , 800×600 , and 1024×768 , and also at higher resolutions to ensure longevity. Until recently, 51% of users were viewing at 800×600 resolution, and another 41% at 1024×768 . Moreover, over 80% are using Microsoft Internet Explorer Version 5 or 6.

Check out your finished site on as many different operating systems and browsers as possible.

`www.webpagesthatsuck.com` is a good way to learn about good web design by looking at examples of poor web design.

1.5.9 Flash

Flash is a program for dynamic web page design that greatly reduces file size. It is relatively easy to do animations and the websites tend to be interactive. It is also easy to do roll-overs. You can download a 30 day free Flash trial from www.macromedia.com/software/flash/trial/.

1.6 XML

XML is a meta-markup language to define other languages. XML describes structure and semantics, not formatting. The following simple example illustrates how XML differs from HTML. In the first example of code below, we see how we could define a song in HTML.

```
<DL>
<DT>Mambo</DT>
<DD>by Enrique Garcia</DD>
</DL>
<UL>
<LI>Producer: Enrique Garcia</LI>
<LI>Publisher: Sony Music Entertainment</LI>
<LI>Length: 3:46</LI>
<LI>Written: 1991</LI>
<LI>Artist: Azucar Moreno</LI>
</UL>
```

The same information in XML could be given as follows:

```
<SONG>
<TITLE>Mambo</TITLE>
<COMPOSER>Enrique Garcia</COMPOSER>
<PRODUCER>Enrique Garcia</PRODUCER>
<PUBLISHER>Sony Music Entertainment</PUBLISHER>
<LENGTH>3:46</LENGTH>
<YEAR>1991</YEAR>
<ARTIST>Azucar Moreno</ARTIST>
</SONG>
```

More about XML can be found at www.w3.org/TR/REC-xml.