CS 200

Lecture 07
The Web
(HTML, CGIs, & CSS)

Miscellaneous Notes

Abbreviations

aka	Also Known As
CSS	Cascading Style Sheets
CWS	Course Web Site

Reading

Learning Web Design (2/e, library reserve)

Extracts from HTML & XHTML (5/e) — The Definitive Guide, Chapter 8 on Cascading Style Sheets
also available online from the University at http://safari.ora.com > MY BOOKSHELF – Book 27

Western Civilization's tutorial on CSS properties (for reference)
http://www.westciv.com/style_master/academy/css_tutorial/introduction/css_intro.html

Sitepoint's CSS Introduction and Documentation (for reference)
http://reference.sitepoint.com/css

The "Cascading Style Sheet Properties Quick Reference" (for reference)
in HTML & XHTML (5/e) The Definitive Guide, available online at http://proquest.safaribooksonline.com/ Book 27

CSS Pocket Reference (3/e), by Eric Meyer, O'Reilly & Associates (book store)

Optional background reading

Web Style Guide, by Lynch & Horton, Yale Univ Press, 0-300-07675-4 (Library Reserves)
Web Style Guide (2/e), by Lynch & Horton, Yale Univ Press, 0-300-09682-8

Optional reference text

CSS — The Definitive Guide (3/e), by Eric Meyer, O'Reilly, ISBN 0-596-52733-0 (Safari Books Online > Book 10)

Administrivia

Please read and high-light, before lab:

- Assignment 5
- This week's slides

There are hyper-text commented source files for many of the web pages used in this lecture

- Handouts > Commented HTML on the CWS

Major topics today

- read and recall pearl
- the client-server paradigm
- putting HTML in context
- relative vs absolute URLs
- tables as a layout tool
- forms
- styles in HTML (esp cascading style sheets)

Today's lecture assumes an elementary understanding of HTML tags & attributes (eg from CS 100)

- if you lack it, see Learning Web Design, or www.htmlCodeTutorial.com

Road Map

New applications for this week

- PageSpinner

  a Mac-only HTML editor

- EditiX

  a cross-platform XML editor

- StyleMaster

  a cross-platform CSS editor

This week's lecture builds on the preceding weeks' material

- tables
- styles
- graphics

The Read 'n Recall Pearl

Dialogs and Menus

- Menus
- Dialogs
- Toolbars & Palettes

Documentation

- The user manual
- Online help
- Online tutorials

Assumptions

You have an understanding of:

- Tables
- Styles
- Indirection

Things to Think About

- How does the manipulation of data objects differ from other applications?
- Is this there more than one way to manipulate a data object?

Client-Server File Sharing

EG the AppleShare file Server on Oscar

- your lab Mac is the "client:" slower, cheaper, smaller disks
- oscar is the "server machine:" faster, more expensive, bigger disks
- AppleShare is the "server application," running on the server machine
- "share points" are folders on the server that are made available over the network
- "network disks"

  "mounting" a share point (use the Finder's Go > Connect to Server... menu item) creates a "network disk" on your client machine

  an icon appears on the desktop, just as for a local disk

  use a network disk just like a local disk, although it's a bit slower
- "network folders"

  these are subfolders (aka subdirectories) of a network disk

  eg 101BeaJ_main is my "cs200main network folder"

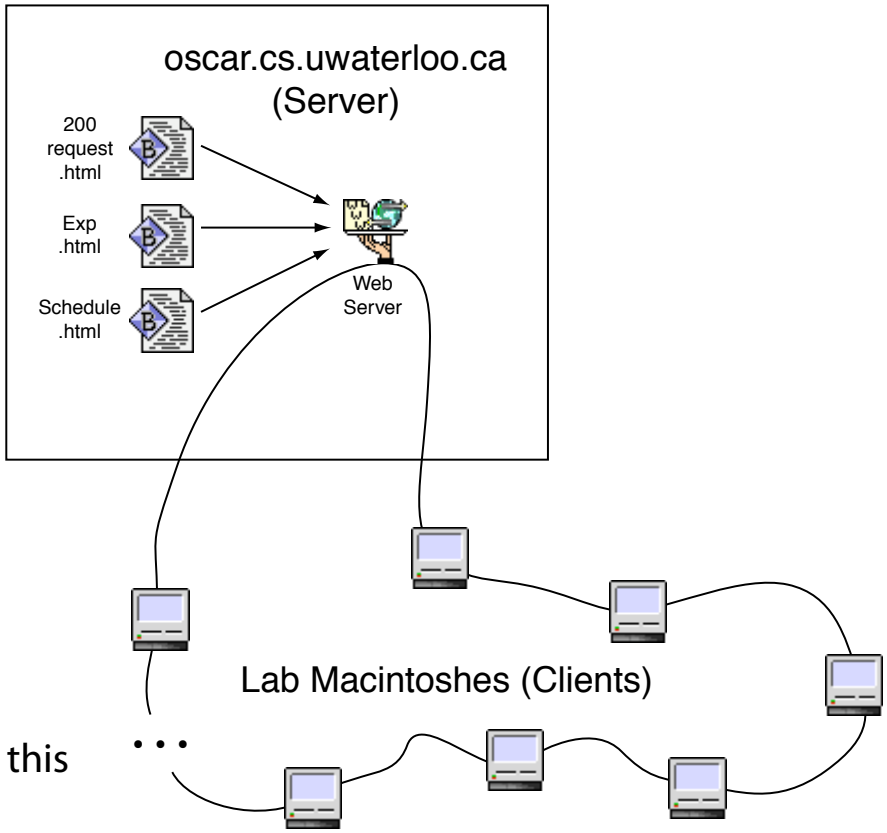
  unlike the other terms on this slide, "network folder" is a CS200-invented term

As distinct from "peer-to-peer" file sharing

The Web (like file-sharing) has a client-server model

Many of the machines on the Internet are "web servers"

- any machine ("client") on the web can ask them for data
- actually, they're asking *a particular application* running on that machine for data (which is identified by a "port")



The client uses a "browser" to request & display web pages

- eg Firefox, Safari, Netscape, Explorer, Camino, Opera, ...
- browsers decide how to render the HTML, based on

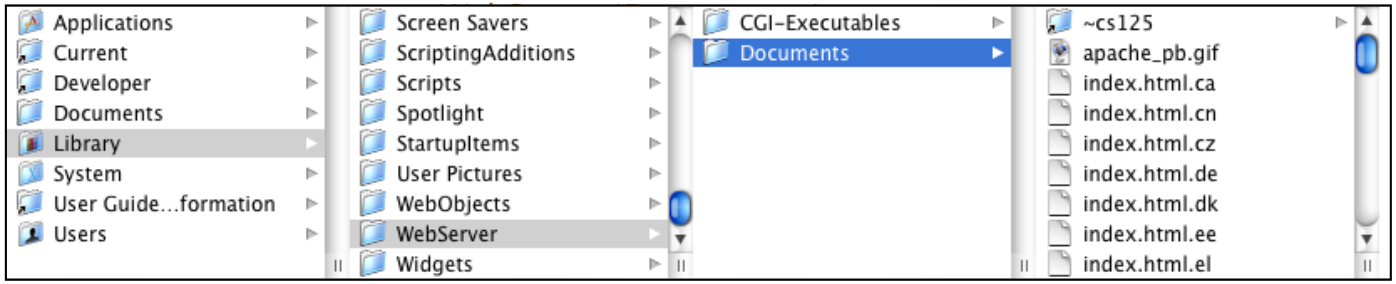
  HTML tags found in the document
  what kind of display is available
  user preferences

- browsers are often (but not always) consistent in how they do this

For security

- a web server can only return files in the "server subtree"
- sometimes that's rooted in the folder holding the server app
- usually this "web root folder" can be set when the web server is started

The default Mac OS X web server application (Apache) is at /usr/sbin/httpd;
the default web document root folder is at /Library/



Data Returned By Web Servers

The files returned can be

- web pages
- pictures
- other stuff...

A "web page" is a TEXT file containing

- text to be displayed (text "elements")
- "tags"

  eg <html> and <p> that control presentation of the text—they're really styles

  "links" containing "URLS" (eg <a href="• • •"> and <img src="• • •">)

  to other web pages

  to graphics, for display on the page

  to sounds, to be played when the page is viewed

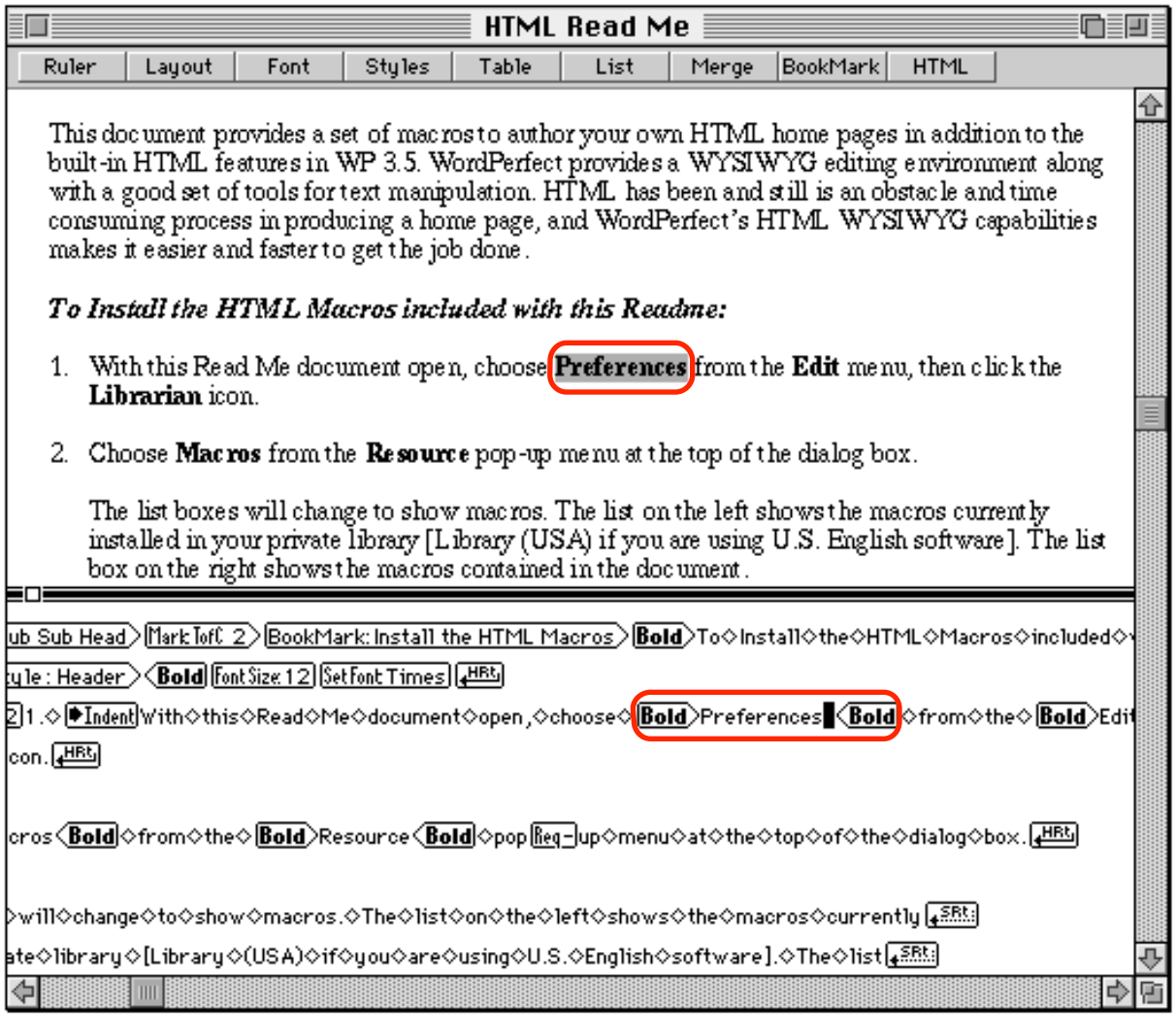
  etc—add post-install "plugins" to handle new file types
  (/Library/Internet Plug-Ins/ or ~/Library/Internet Plug-Ins/ on Macs)
- URL = Uniform Resource Locator (eg "jcbServer.cs.uwaterloo.ca/cs200/index.html")
  (aka URI = Uniform Resource Indicator—yuck)

Formatting Tags in WordPerfect

T

What you see here are "property tags"
but they could equally well be (named) style tags

Strip out all the formatting codes
to get a "text" or "ascii" file



A Toy Web Page

The HTML for this web page

```
<HTML><HEAD><TITLE>Jen's Fake Home Page</TITLE></HEAD><BODY bgcolor="#FFFFFF"><IMG SRC="star.gif"><IMG
SRC="JenBanner.gif"><IMG SRC="star.gif"><CENTER><H2>Welcome to my Web page</H2></CENTER><IMG SRC="Exclamation.gif"
ALIGN=left HSPACE=6><P><STRONG>Warning!</STRONG> This is not my <EM>real</EM> home page. It's just a little something I
made up for the occasion. But just in case you're interested, I'll tell you a bit about me.</P><HR><H2>Places I've Lived</H2><UL><LI>
Akron, OH</LI><LI>Hudson, OH</LI><LI>Sourth Bend, IN</LI><LI>Boston, MA</LI></UL><P style="font-size:80%">(Adapted from
"Designing for the Web - Getting Started in a New Medium" by Jennifer Niederst and Edie Freedman.)</P></BODY></HTML>
```

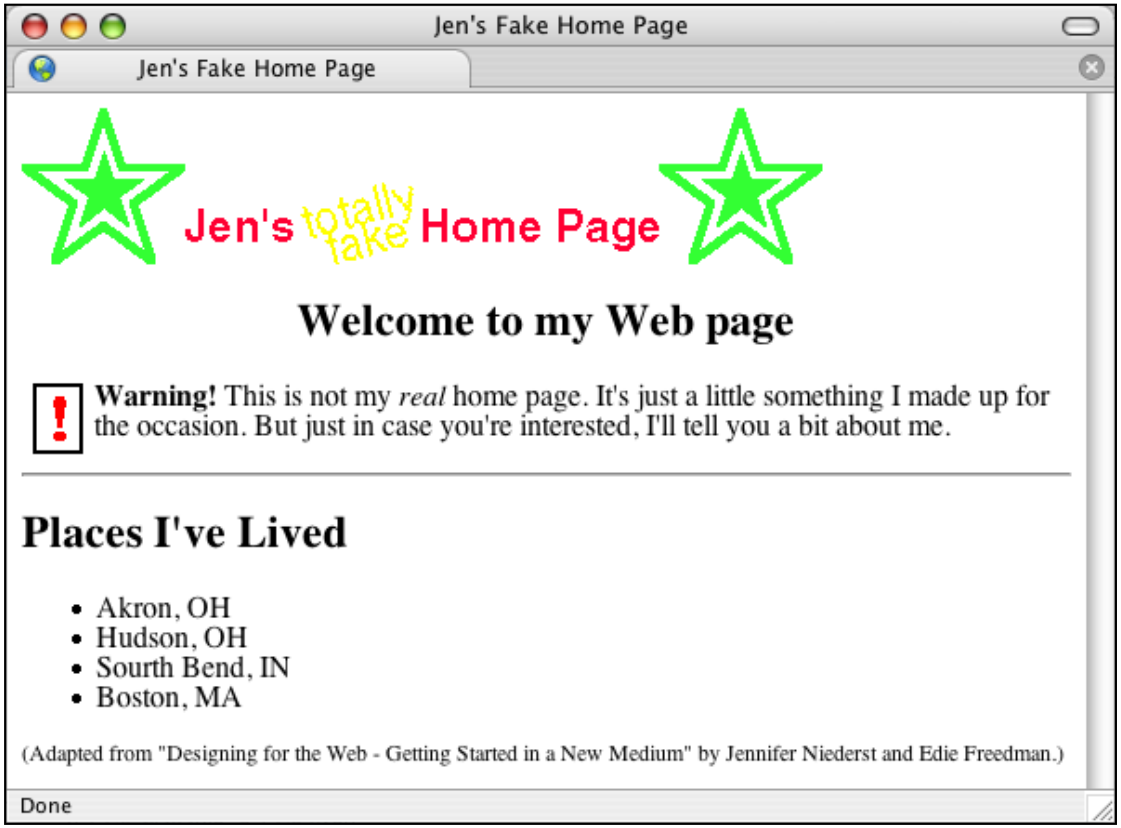
Yuck!

Recall that browsers ignore

- multiple blanks
- carriage returns
- blank lines

Use these to make your HTML more readable!

- You'll lose marks in CS 200 if you don't
- You'll make your life difficult if you don't



The HTML for our Toy Web Page, Readably Formatted

```
<HTML>
    <HEAD>
        <TITLE>Jen's Fake Home Page</TITLE>
    </HEAD>

    <BODY bgcolor="#FFFFFF">

        <IMG SRC="star.gif"><IMG SRC="JenBanner.gif"><IMG SRC="star.gif">

        <CENTER><H2>Welcome to my Web page</H2></CENTER>

        <IMG SRC="Exclamation.gif" ALIGN=left HSPACE=6>

        <P>
            <STRONG>Warning!</STRONG> This is not my <EM>real</EM> home page.
            It's just a little something I made up for the occasion.
            But just in case you're interested, I'll tell you a bit about me.
        </P>

        <HR>

        <H2>Places I've Lived</H2>

        <UL>
            <LI>Akron, OH</LI>
            <LI>Hudson, OH</LI>
            <LI>Sourth Bend, IN</LI>
            <LI>Boston, MA</LI>
        </UL>

        <P style="font-size:80%">
            (Adapted from "Designing for the Web - Getting Started in a New Medium"
            by Jennifer Niederst and Edie Freedman.)
        </P>

    </BODY>
</HTML>
```

Discussion Points

HTML is stored in "[ASCII] text files"

HTML tags as (named) styles

- whose definitions are supplied by the browser
- same web page, different browser,
  generally similar (but not identical) appearance...

Always use closing tags (eg </P>, </LI>)

- otherwise the browser must guess their location
- be prepared for XHTML, XML & CSS

<HEAD> ... </HEAD>

- <HEAD> *does not mean* "header"
- <HEAD>...</HEAD> contain information *about* the page
- eg <meta name=description value="a paragraph">
- eg <meta name=author value="Bugs Bunny">
- eg <title>...</title>

  ... shows up in most browsers' title bar

  browsers use ... to label bookmarks

  index engines give words in ... extra weight

<BODY>...</BODY> contain info displayed in the page

Camino 1.6

If you view this page in any of the common browsers, you will find that they share two major deficiencies:

- paragraphs are separated by too much white space (typically an entire blank line),
- and list items are separated by too little white space (typically none beyond the current line-to-line leading).

Firefox 3.0

If you view this page in any of the common browsers, you will find that they share two major deficiencies:

- paragraphs are separated by too much white space (typically an entire blank line),
- and list items are separated by too little white space (typically none beyond the current line-to-line leading)

Omniweb 5.7

If you view this page in any of the common browsers, you will find that they share two major deficiencies:

- paragraphs are separated by too much white space (typically an entire blank line),
- and list items are separated by too little white space (typically none beyond the current line-to-line

Opera 9.5

If you view this page in any of the common browsers, you will find that they share two major deficiencies:

- paragraphs are separated by too much white space (typically an entire blank line),
- and list items are separated by too little white space (typically none beyond the current line-to-line leading).

More Discussion Points

Browsers also *ignore* tags they don't recognize

- eg tags you misspell
- this is actually a feature

  so newly invented tags don't screw up old browsers

  so IE-specific tags don't screw up Netscape, & vice-versa

  etc
- but it makes debugging HTML harder
- therefore ... when a tag doesn't seem to have any effect

  suspect misspelling
- Validation - see the assignment for details

  That's what the <!DOCTYPE ...> magic incantation is for (see next slide)

Upper case *vs* lower case

- who cares?

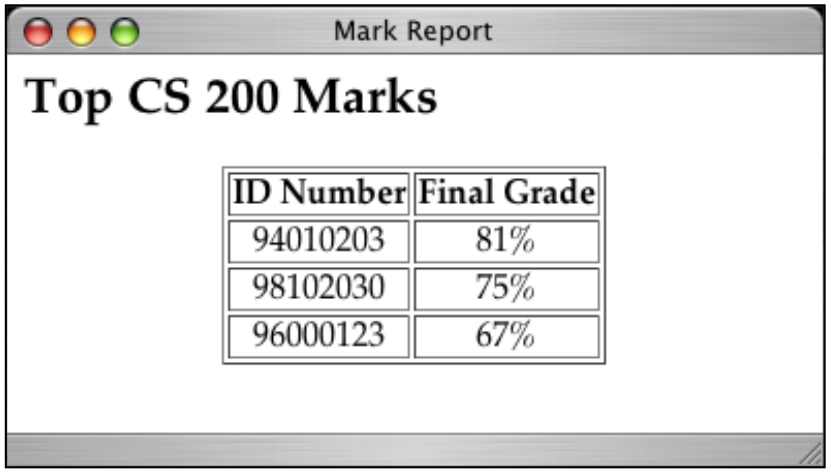
  HTML is case-insensitive: <TITLE>...</title> works fine

  XHTML requires that tags be lower case

  XML is case-sensitive
- suggestion: use lower case

A Simple HTML Table

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
<HTML>

    <HEAD>
       <TITLE>Mark Report</TITLE>
    </HEAD>

    <BODY>

       <H2>Top CS200 Marks</H2>

       <TABLE BORDER=1 ALIGN="center">

            <TR ALIGN="center">
               <TH>ID Number  </TH>
               <TH>Final Grade</TH>
            </TR>

            <TR ALIGN="center">
               <TD>94010203   </TD>
               <TD>81%        </TD>
            </TR>

            <TR ALIGN="center">
               <TD>98102030   </TD>
               <TD>75%        </TD>
            </TR>

            <TR ALIGN="center">
               <TD>96000123   </TD>
               <TD>67%        </TD>
            </TR>

       </TABLE>

    </BODY>

</HTML>
```



For a list of valid doctypes, see
http://www.w3.org/QA/2002/04/valid-dtd-list.html

HTML Table Tags

<table> . . . </table>

surround the entire table

<tr> . . . </tr>

surround a table row

<td> . . . </td>

surround a table (cell) definition

By default

a table and its cells are as wide as they need to be

For details, see

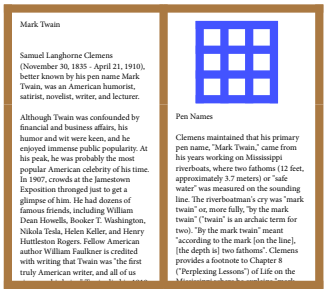
HTML The Definitive Guide (library reserve)

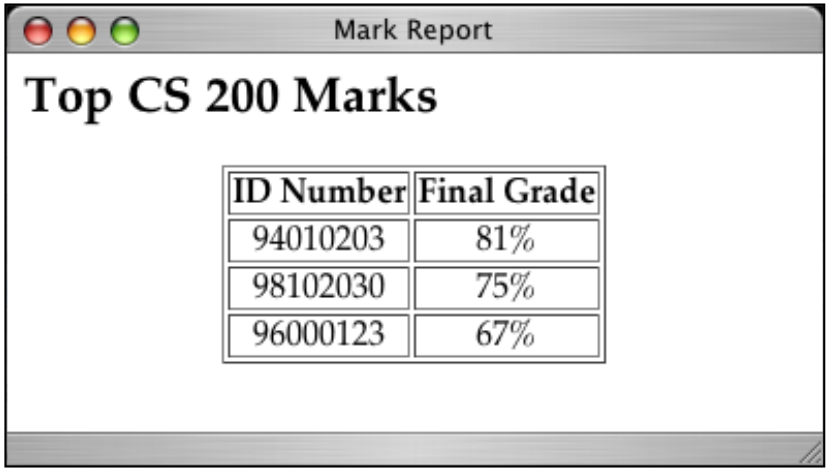
PageSpinner Help

Tables as a (deprecated) all-purpose layout tool in HTML

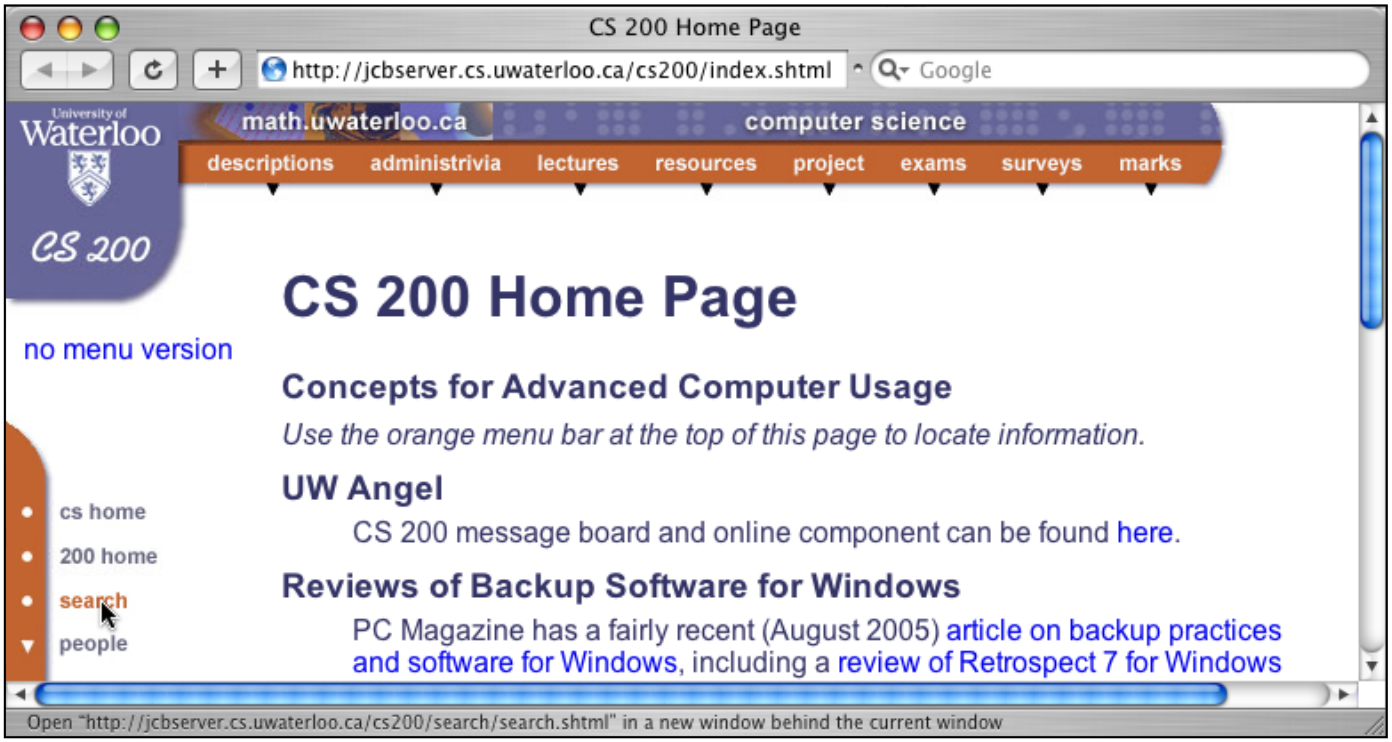
(Hmm. Are tables a useful layout tool in word processors?)

HTML Tables can be nested
and HTML cells can be "merged"
horizontally (colspan="n")
and/or
vertically (rowspan="n")
No L-shaped regions, however





URLs — Uniform Resource Locators



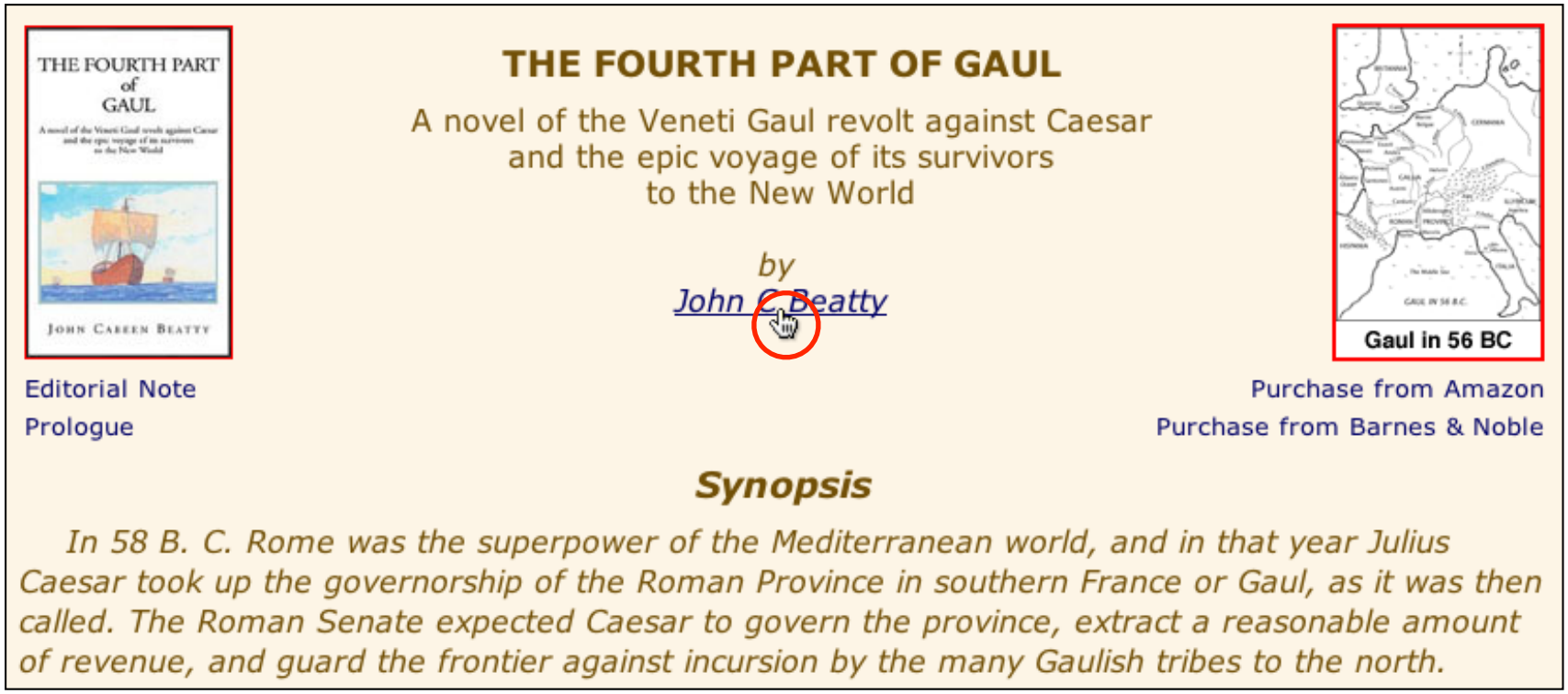
For search ,
(equivalent to search)

- http — is the "protocol"
- jcbServer — is the server's "local name"
- cs.uwaterloo.ca — is the "domain" in which the server is located
- jcbServer.cs.uwaterloo.ca — is the server's "host domain name"
- 80 — is the "port" on which jcbServer's web server application is listening
- /cs200/search/search.html — is the "absolute path" from the server's web root folder to the file

[An anchor with another protocol: • • •]

Another Example URL

Another example:



<a href="fragments/bio/biography.html">John C Beatty</A>

fragments/bio/biography.html

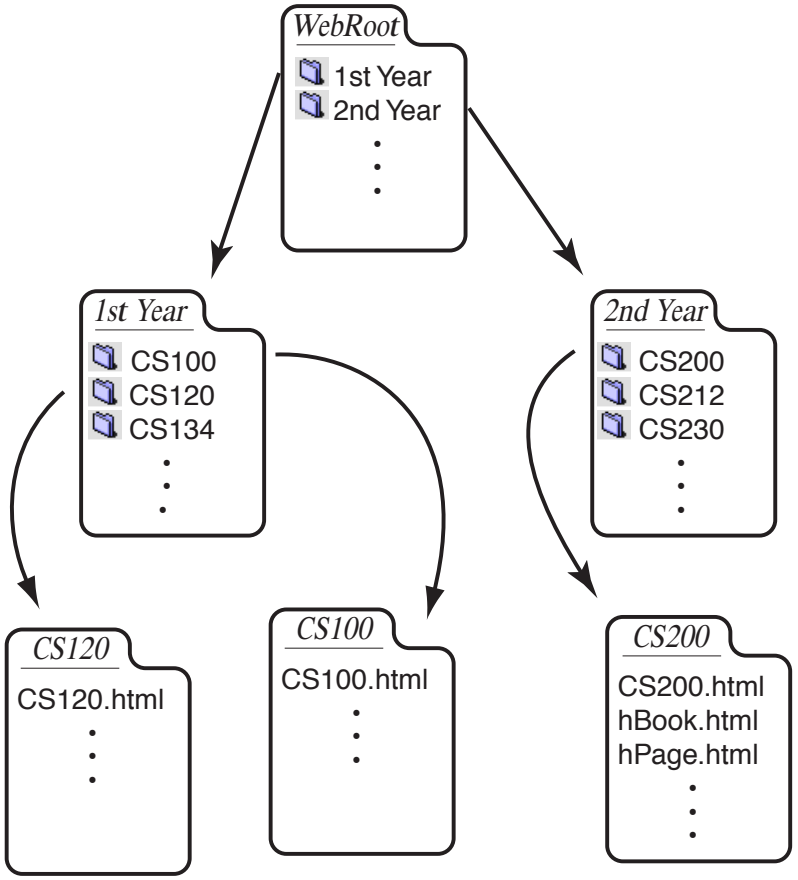
- is a "relative path" to the target file
- starting in the folder containing the page holding the link
- (note the LACK of an initial "/" and host domain name)

<IMG SRC= ... > works the same way

Relative vs Absolute Paths (1)

The web root folder

- a web server can only return files in the "server subtree"
- sometimes that's rooted in the folder holding the server app
- sometimes this "web root folder" can be set elsewhere



Relative vs Absolute Paths (2)

A link in CS100.html to CS200.html could be written as

- CS200
- Note the initial slash
- This is an "absolute path"
- The host domain name is implicit

  ie the same as the referencing web page

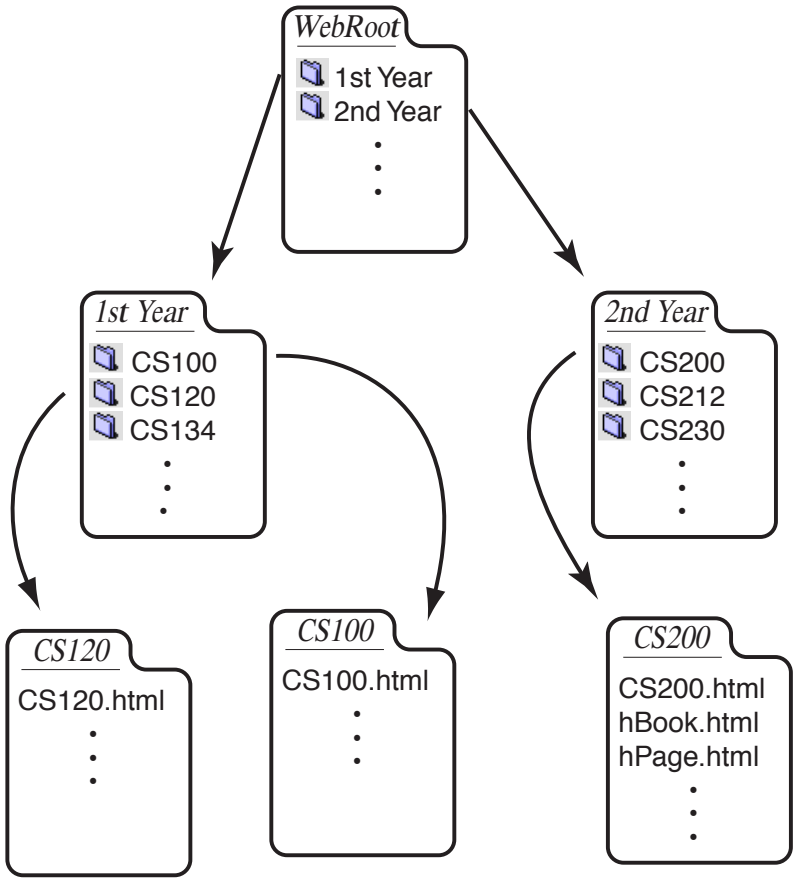
Or as

- CS200
- Note the initial "../../"
- This is a "relative path"

  ../ means "go up one level to the parent folder"

  ../../ means "go up two levels," etc

  note: for security reasons, the web server application will prevent the path from rising above the web root folder!



Or using an explicit host domain name AND an absolute path

- CS200

It makes no sense to combine a host domain name and a relative path

When to use relative *vs* absolute paths

Absolute paths

- always start at the web root folder
- are necessary between machines
- if a host domain name is present, the path is necessarily absolute

Relative paths

- start at the document containing the link
- make it MUCH easier to move web pages around as a group

  eg if all the cs200 pages use relative URLs amongst themselves
  then I can move the cs200 subtree somewhere else
  without breaking the links between the cs200 pages

- but if a file in the group links to a file on the same machine not in the group
  it must use an absolute file path (or the group can't be moved w/o breaking that link)

IMPORTANT

- you MUST write "**%20**" instead of a space in URLs
- and look out for trailing blanks

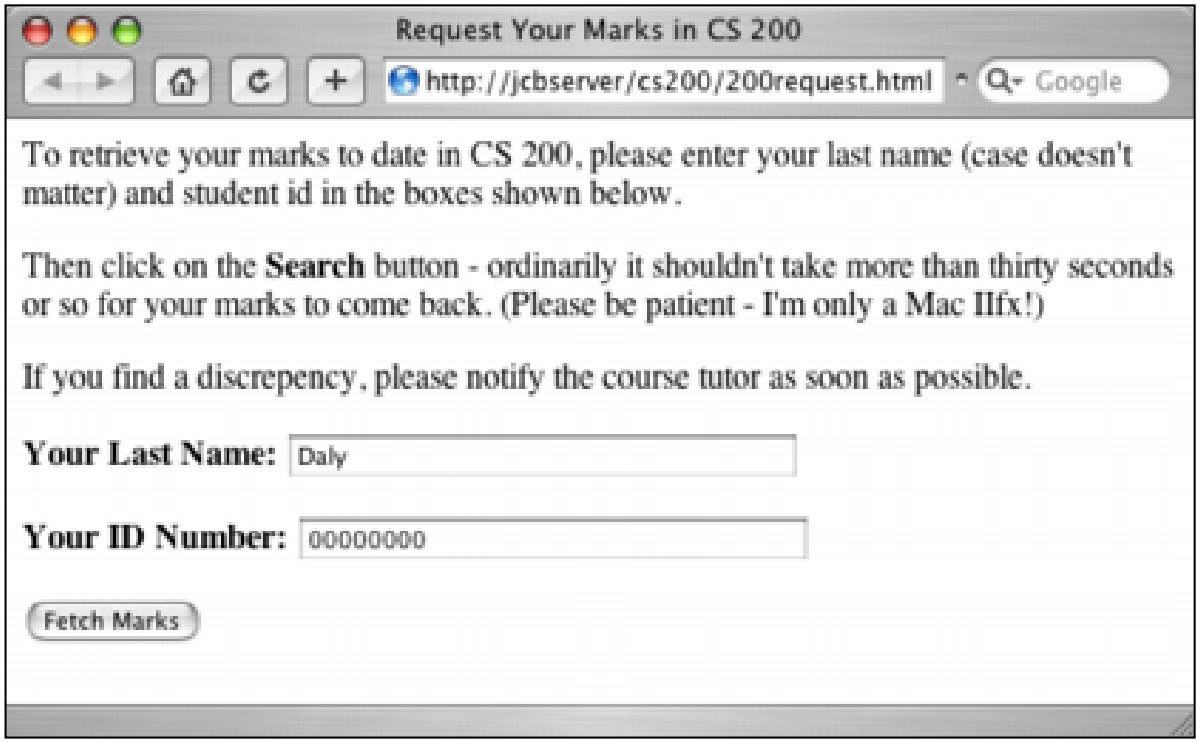
So within a web site...

- use a relative path when the two files are more likely to be *moved together* (eg a page & an image in it)
- use an absolute path when the two files are more likely to be *moved separately*

Forms

An HTML form is a web page with "[interface] widgets" for supplying data

- text edit boxes
- check boxes
- radio buttons
- pop-up menus



Forms and CGIs

Web Servers can't know in advance

- what forms data will be sent to them
- what should be done with it

So there's a convention (the "Common Gateway Interface")

- for identifying the particular application
- to which form data should be sent for processing

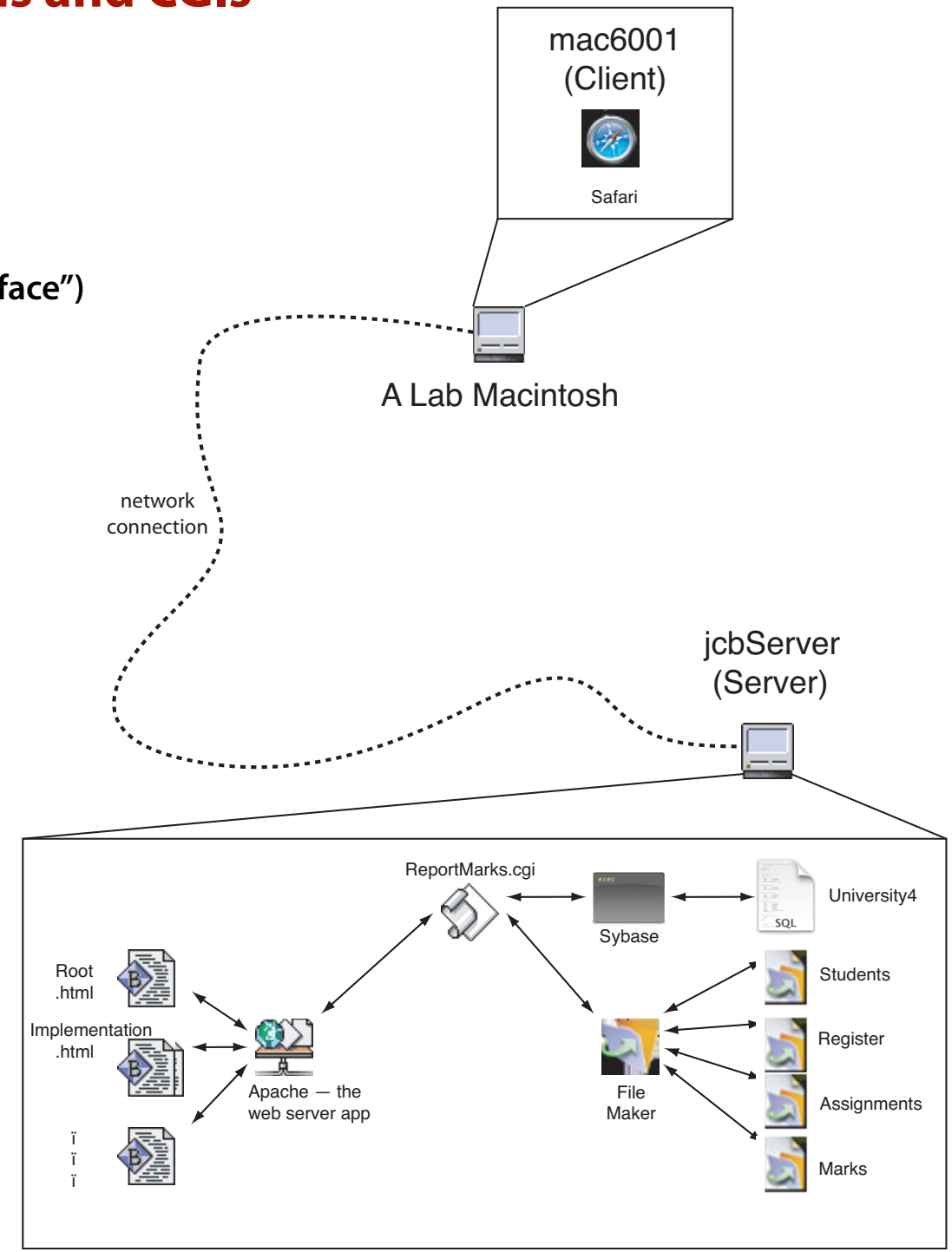
Actually, the CGI scheme is more general than this

a web server can run any application
and return its output

When the submit button is pressed

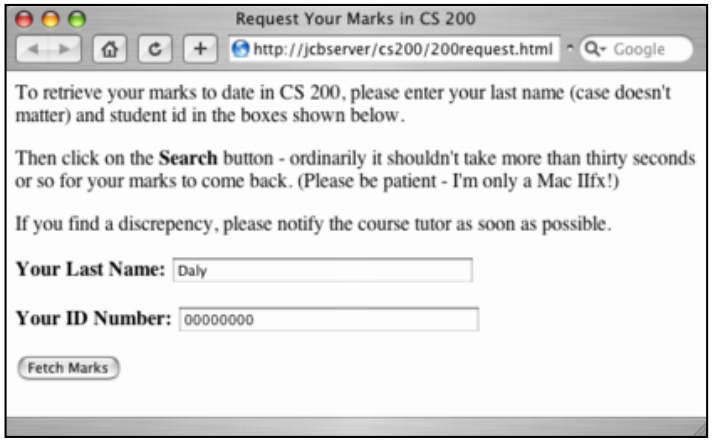
- the data is sent to a web server
- the web server forwards the data to a "cgi" (a separate program)
- the cgi processes the data & returns a web page to the server
- the server passes that response on to the browser

Plug-ins



The CS 200 request marks form (simplified)

```
<HTML>
   <HEAD>
      <TITLE>Request Your Marks in CS 200</TITLE>
   </HEAD>
   <BODY>

      <P>To retrieve your marks to date in CS 200, please enter your last name
      (case doesn't matter) and student id in the boxes shown below.</P>

      <P>Then click on the <STRONG>Fetch Marks</STRONG> button - ordinarily it
      shouldn't take more than thirty seconds or so for your marks to come back.
      (Please be patient - I'm only a Mac IIfx!)</P>

      <P>If you find a discrepancy, please notify the course tutor as soon as
      possible.</P>

      <FORM ACTION="http:../ReportMarks.cgi" METHOD="GET">
         <P>
            <STRONG>Your Last Name: </STRONG>
            <INPUT TYPE="text" NAME="surname" SIZE="33">
         </P>
         <P>
            <STRONG>Your ID Number: </STRONG>
            <INPUT TYPE="text" NAME="idnumber" SIZE="33">
         </P>

         <P> <INPUT TYPE="submit"  VALUE="Fetch Marks"> </P>

         <P> <INPUT TYPE="hidden" NAME="course" VALUE="cs200"> </P>
      </FORM>

   </BODY>
</HTML>
```



Note the use of a "hidden parameter" that the user never sees so forms for different courses can use the same cgi.

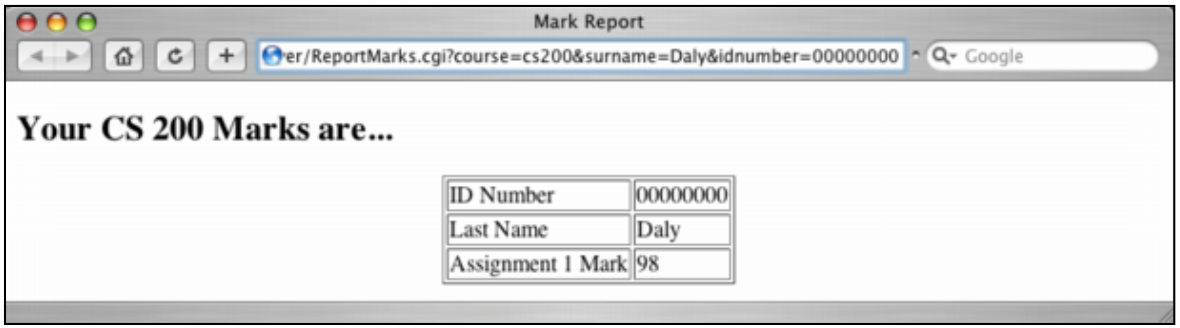
What Gets Sent to the Server (GET)

T

```
GET ../ReportMarks.cgi?course=cs200&surname=Daly&idnumber=00000000 HTTP/1.0
Connection: Keep-Alive
User-Agent: Mozilla/4.06 (Macintosh; U; PPC, Nav)
Host: jcbServer.cs.uwaterloo.ca
Accept: image/gif, image/x-xbitmap, image/jpeg, image/pjpeg, image/png, */*
Accept-Encoding: gzip
Accept-Language: en
Accept-Charset: iso-8859-1,*,utf-8
```

The rules for this stuff are part of the "http protocol."

What comes back



../ReportMarks.cgi locates the program (a "cgi") to which the server forwards the forms data

Notice

that the URL from which a web page came always appears in the location bar

that the forms data is encoded in the URL

how that URL appears in what's sent to the server

why the path to the cgi had better not contain a question mark!

POST Actions

The request marks form could have said

<FORM ACTION="http:../ReportMarks.cgi" METHOD="POST">

In which case the forms data would be transferred a bit differently

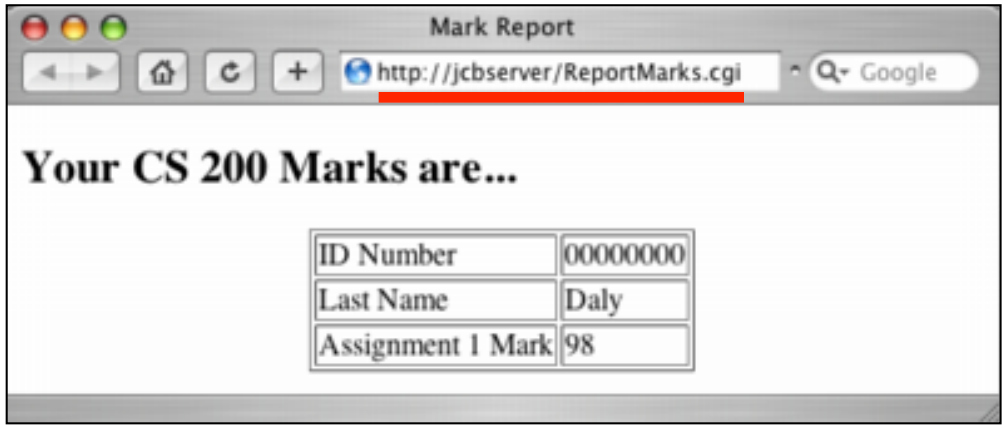
```
POST ../ReportMarks.cgi HTTP/1.0
Connection: Keep-Alive
User-Agent: Mozilla/4.06 (Macintosh; U; PPC, Nav)
Host: 192.168.1.100
Accept: image/gif, image/x-xbitmap, image/jpeg, image/pjpeg, image/png, */*
Accept-Encoding: gzip
Accept-Language: en
Accept-Charset: iso-8859-1,*,utf-8
Content-type: application/x-www-form-urlencoded
CONTENT-LENGTH: 43
course=cs200&surname=Daly&idnumber=00000000
```

The details of this difference are not important to us

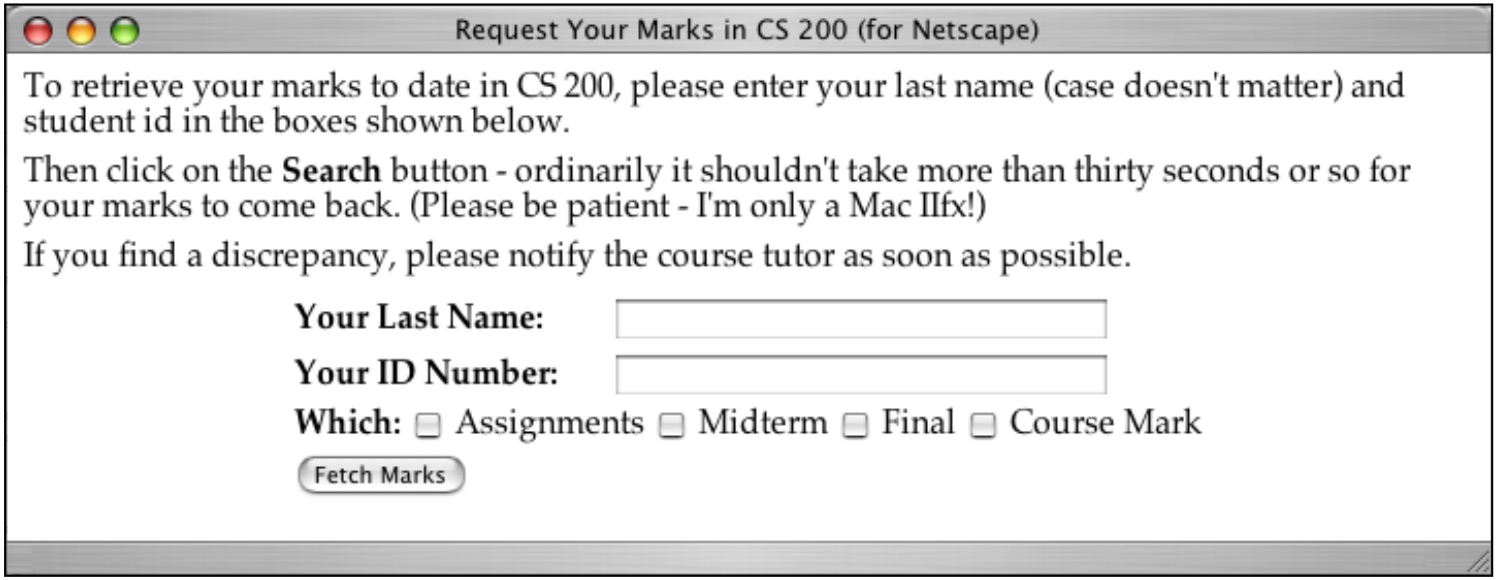
But you do need to know that

POST is necessary for large quantities of data — say > 256 characters

POST'ed form data does not appear in the URL and therefore *cannot be bookmarked*



Laying Out a Form as a Table — The Form




```
<HTML>                  <!-- The beginning of the web page - the FORM and TABLE are on the next page. -->
    <HEAD>
        <TITLE>Request Your Marks in CS 200 </TITLE>
    </HEAD>
    <BODY>
        <P>
            To retrieve your marks to date in CS 200, please enter your last name
            (case doesn't matter) and student id in the boxes shown below.
        </P>
        <P>
            Then click on the <STRONG>Search</STRONG> button - ordinarily it shouldn't
            take more than thirty seconds or so for your marks to come back.
            (Please be patient - I'm only a Mac IIfx!)
        </P>
        <P>
            If you find a discrepancy, please notify the course tutor as soon as possible.
        </P>
        <CENTER>
```

```
        <FORM ACTION="http:../ReportMarks.cgi" METHOD="POST">
            <INPUT TYPE="hidden" NAME="course" VALUE="cs200">
            <TABLE>
                <TR>
                    <TD><STRONG>Your Last Name:</STRONG>              </TD>
                    <TD><INPUT TYPE="text" NAME="surname" SIZE="33"> </TD>
                </TR>
                <TR>
                    <TD><STRONG>Your ID Number:</STRONG>              </TD>
                    <TD><INPUT TYPE="text" NAME="idnumber" SIZE="33"></TD>
                </TR>
                <TR>
                    <TD COLSPAN="2">
                        <STRONG>Which:</STRONG>
                        <INPUT TYPE="checkbox" NAME="which" VALUE="assign">  Assignments
                        <INPUT TYPE="checkbox" NAME="which" VALUE="midterm"> Midterm
                        <INPUT TYPE="checkbox" NAME="which" VALUE="final">   Final
                        <INPUT TYPE="checkbox" NAME="which" VALUE="course">  Course Mark
                    </TD>
                </TR>
                <TR>
                    <TD ALIGN=left><INPUT TYPE="submit" VALUE="Fetch Marks"></TD>
                </TR>
            </TABLE>
        </FORM>
    </CENTER>
    </BODY>
</HTML>
```

<xxx>	form tags
<yyy>	table tags

Styles in HTML

Most tags are named styles: , , <p>, <ol>, ...

- these are "logical tags"
- browsers decide how to render them

Although a few are not: <b>, <i>

- these are "physical tags"
- browsers have no choice

Generally speaking

- the browser, not the web author, controls layout
- browsers sometimes behave differently

But appearance is important!

Controlling HTML Layout

The response

- abusing tables and frames
- new tags and attributes
- proprietary tags and attributes
- postscript and pdf (Adobe's "Portable Document Format") via "plugins"

Wouldn't it be nice ...

- if HTML had USER-DEFINED [named] styles?
- like those we find in word processors?
- that authors could use to control layout?

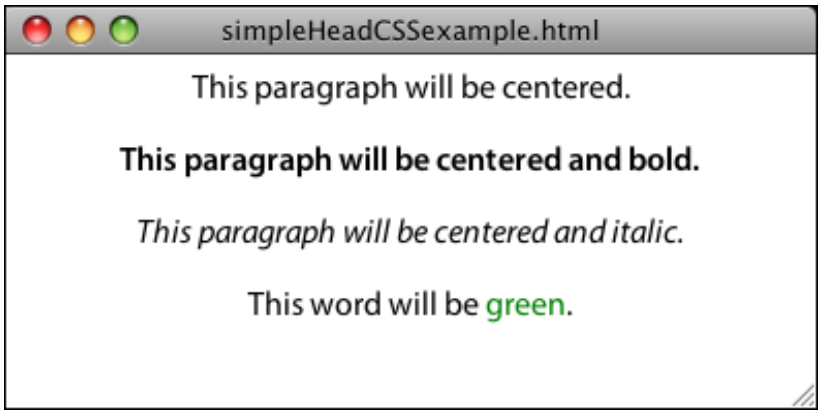
Cascading Style Sheets

Style definitions may appear at the beginning of a web page
There are five style definitions in this example

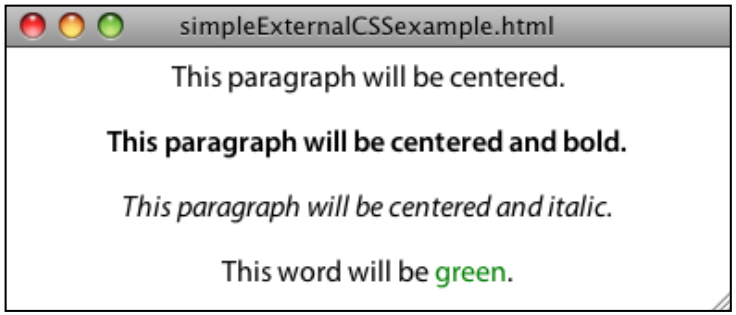
the first specifies the default font to be used
the second and third attach default "properties" (ie attributes) to <SPAN> and <P>
the last two define property bundles that can be applied to <P>

These are called "selectors"

```
<HTML>
    <HEAD>
        <STYLE TYPE="TEXT/CSS">
            BODY   { FONT-FAMILY: 'Myriad Pro', sans-serif }
            SPAN   { COLOR:       green                    }
            P      { TEXT-ALIGN:  center                   }
            P.A    { FONT-WEIGHT: bold                     }
            P.B    { FONT-STYLE:  italic                   }
        </STYLE>
    </HEAD>
    <BODY>
        <P>         This paragraph will be centered.            </P>
        <P CLASS=A> This paragraph will be centered and bold.   </P>
        <P CLASS=B> This paragraph will be centered and italic. </P>
        <P>         This word will be <SPAN>green</SPAN>.       </P>
    </BODY>
</HTML>
```



External CSS files



Or ... style definitions may be EXTERNAL to a web page

- so that multiple web pages can use them
- **much more important for HTML** than for word processing
- An example style sheet file named simple.css

```
BODY  { FONT-FAMILY: 'Myriad Pro', sans-serif }
SPAN  { COLOR:       green                    }
P     { TEXT-ALIGN:  center                   }
P.A   { FONT-WEIGHT: bold                     }
P.B   { FONT-STYLE:  italic                   }
```

- An example html file that uses simple.css

```
<HTML>
    <HEAD>
        <LINK REL="stylesheet" TYPE="text/css" HREF="simple.css"   >
    </HEAD>
    <BODY>
        <P>         This paragraph will be centered.            </P>
        <P CLASS=A> This paragraph will be centered and bold.   </P>
        <P CLASS=B> This paragraph will be centered and italic. </P>
        <P>         This word will be <SPAN>green</SPAN>.       </P>
    </BODY>
</HTML>
```

Notice that all four paragraphs are centered and in Myriad Pro

- The contents of <P class=A>...</P> and <P class=B>...</P> "inherit" the properties of <P>, so they don't have to explicitly set them
- Inner elements inherit properties from outer elements containing them (when that makes sense) — eg the <P...>...</P> inherit Myriad Pro from the <BODY>...</BODY> in which they appear

A Larger Example – Task B from the Winter 98 Lab Exam

T

Lab Exam – Task A

http://jcbserver.uwaterloo.ca/cs200/SampleExams/LabExam/TaskI

Google

University of Waterloo

math.uwaterloo.ca computer science

descriptions administrivia lectures resources project exams surveys marks

CS 200

Use Menus

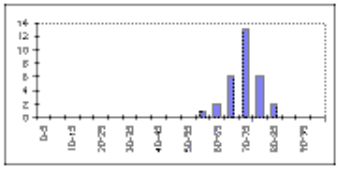
Introduction | Preliminaries | Task A | Task B | Task C

- cs home
- 200 home
- search
- people

Sample Lab Exam - Task B

This page is best displayed with Internet Explorer 4 or 5; Netscape 4 gets some of the leading wrong...

To use computers effectively it is important to select an appropriate tool for each task; more often than not this involves using several tools to solve a problem, passing data from one tool to the next as you work. This task is an example of such.



The problem. As a teacher, you often want to look at a bar chart (like the example on the right) showing the distribution of marks for a course -- how many people received marks between 70 and 75, how many between 75 and 80, etc.

The solution. You have a FileMaker table containing the final grades for each student, but databases aren't good at making graphs, and you often want to include such graphs in end-of-term reports for your department chair. So you need to transfer data between FileMaker, Excel, and Microsoft Word as you work. Because you and your colleagues do this often, you want to work out a convenient and efficient way of doing so.

Password-protected demonstration solutions may be found in the Demo Solutions subfolder of the 200exams disk on jcbServer. Copy them to your personal subfolder of 200exams before running them.

Demo Course Grades. *When the Do It! button on the Choose layout is clicked, grades for the course currently selected by the Which Course popup are written into a file called Data in the same folder.*

Demo Make Histograms. *Click the Get Data button in any of the worksheets to open the Data file, copy its contents into the Grades worksheet, and then close it*

LabExam.css

Note the period that begins each style name

- such styles can be used in any tag (if they make sense...)

<DIV> is (effectively) a replacement for <P>

- with no default properties
- (some properties of built-in tags like <P> can't be over-ridden) [still?]
- and are examples of "block level tags" or elements (ie they cause a line break)

<SPAN> is an "inline level tag" (aka an "inline element")

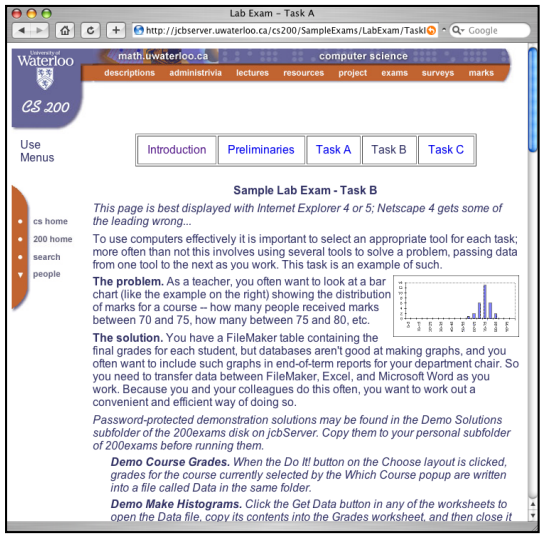
- with no built-in properties
- does *not* cause a line break
- , , <img> and <a> are other examples

"STYLE" is used to set CSS attributes for a particular tag only

- eg blah, blah, blah...
- eg good stuff
- eg <li style="color:green" >clear desk
- eg Good work!

Block level tags generate automatic line breaks before & after. Inline tags do not; one can follow another on the same line.

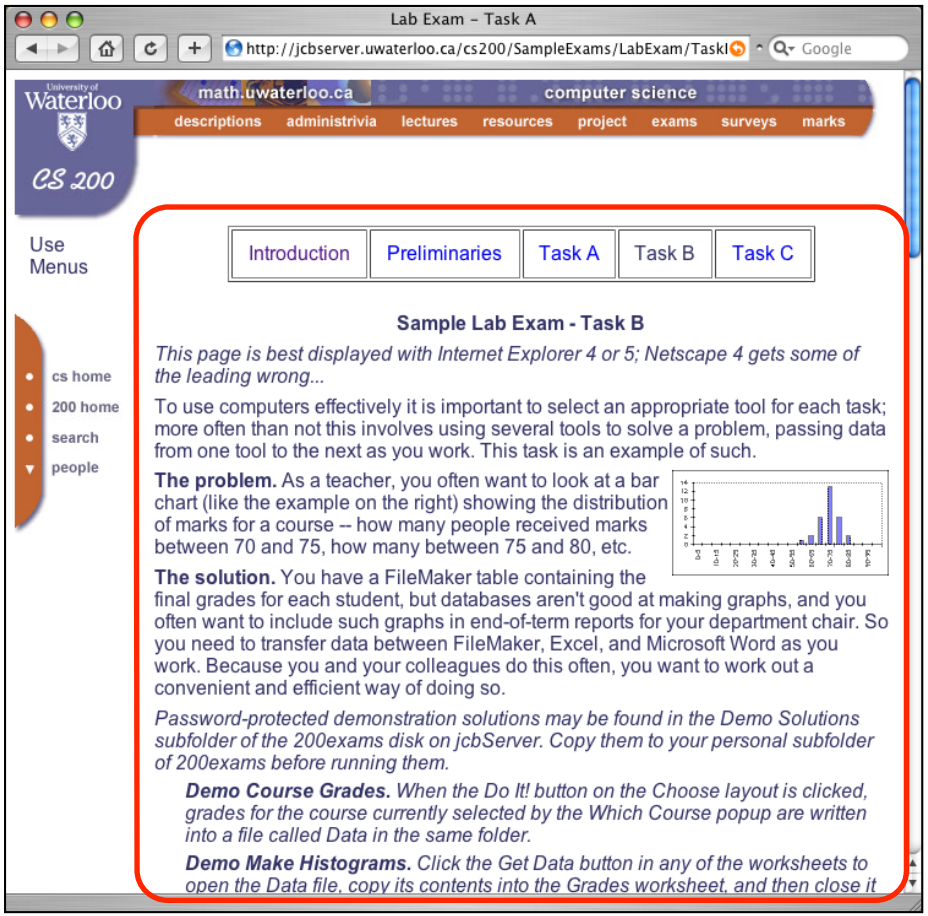
```
.Block {
          font-family: "Palatino, serif";
          line-height: 15px;
          margin-top:  7px;
}
.Item1 {
          font-family: "Palatino, serif";
          line-height: 15px;
          margin-top:  5px;
          margin-left: 25px;
}
.Item2 {
          font-family: "Palatino, serif";
          margin-top:  5px;
}
.Footnote {
          font-family: "Palatino, serif";
          font-size:   10pt;
          line-height: 13px;
          margin-top:  5px;
}
.Emphasize {
          font-style:  italic;
}
.Shout {
          font-weight: bold;
}
```



TaskB.html — the "body" part of the web page (1)

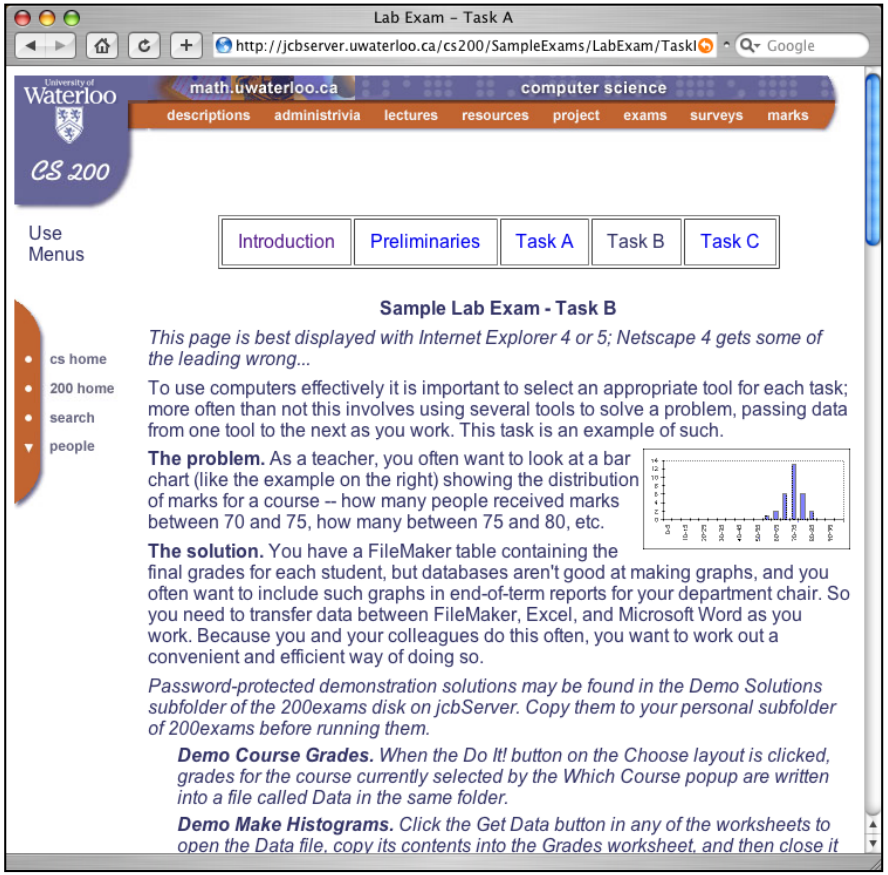
T

```
<HTML>

<HEAD>
    <LINK REL="STYLESHEET" HREF="LabExam.css">
    <TITLE>Lab Exam - Task B</TITLE>
</HEAD>

<BODY>
    <DIV CLASS="Block" style="text-align:center; font-weight:bold">
       Sample Lab Examp - Task B
    </DIV>
    <DIV CLASS="Block" style="font-style: italic">
       This page is best displayed with • • •
    </DIV>
    <DIV CLASS="Block">
       To use computers effectively it is important
       • • •
    </DIV>

    <IMG SRC="TaskB1small.gif" align=right>

    <DIV CLASS="Block">
       <SPAN class="Shout">The problem.</SPAN>
       As a teacher, you often want • • •
    </DIV>

    <DIV CLASS="Block">
       <SPAN class="Shout">The solution.</SPAN>
        You have a FileMaker table • • •
    </DIV>
```



TaskB.html — the "body" part of the web page (2)

```
<I>
    <DIV CLASS="Block">
       Password-protected demonstration solutions • • •
    </DIV>

    <DIV CLASS="Item1">
       <SPAN class="Shout">Demo Course Grades.</SPAN>
       When the Do It! button on the Choose layout • • •
    </DIV>

    <DIV CLASS="Item1">
       <SPAN class="Shout">Demo Make Histograms.</SPAN>
       Click the Get Data button in any • • •
    </DIV>

    <DIV CLASS="Item1">
       The charts in By 5 and By 10 can • • •
    </DIV>
</I>

<DIV CLASS="Block">
    You are to duplicate the behaviour • • •
</DIV>

<DIV CLASS="Block">
    (The relative weight of important pieces • • •
</DIV>

• • •
```



Another Example, from "Eric Meyer on CSS"

http://jcbserver.uwaterloo.ca/cs200/ericMeyer/ericMeyer.html

T

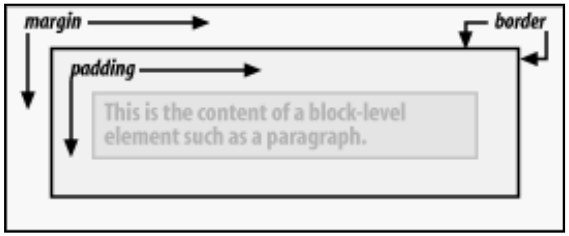
The Style Sheet

0 ≤ r, g, b ≤ 255

a colour name

```
body {
    background:   rgb(153,102,51);
    color:        black;
    font-family:  'Myriad Pro', sans-serif;
}

div.wrap {
    background:   rgb(251,233,198);
    color:        rgb(122,74,26);
    margin:       0 2em;
}

p {
    margin:       0;
    padding:      0.25em 1em 0.25em 1em;
    text-indent:  1.25em;
    line-height:  120%;
}

h1, h2 {
    margin:       0;
    padding:      0.25em 0.5em 0.25em 0.5em;
}

div#p1 {
    margin:       0 2em 0 10em;
}
```

top, right, bottom, left



CSS for <div ID="p2"}>...

```
div#p2 {
    margin:       0 10em 0 2em;
}

div#menu {
    float:        right;
    width:        5em;
    padding:      0;
    margin:       0 -1.5em 0.25em 0.5em;
    border:       3px solid rgb(50,50,175);
    background:   white;
}

div#menu a {
    display:      block;
    text-align:   center;
    padding:      0.2em 0.5em 0.2em 0.5em;
}

div#footer {
    margin:       0 11em 0 2em;
    padding:      0.2em 0 0.5em 0;
    text-align:   center;
    font-style:   italic;
    color:        rgb(128,128,128);
}
```

top, right, bottom, left

Other Selectors

What we've seen

p { ••• }	sets attributes for all tags
p.name	sets attributes for all <p class="name" ••• > tags
p#name	sets attributes for the <p id="name" ••• > tag

There are a variety of useful selectors we haven't discussed, including

h1, h2, h3 { ••• }	grouped selectors (same attributes for multiple tags)
p[title] { ••• }	attributes for all tags (ie tags having a title attribute)
p[title="important"] { ••• }	attributes for all tags <p title="important" ••• >
h1 > strong { ••• }	attributes for appearing "immediately" *within* an <h1> eg <h1>This is very important.</h1>
h1 + p { ••• }	attributes for any that immediately *follows* an <h1> eg <h1>Section A</h1> For this para. But not this one.
tr > td:first-child	attributes for <td> when it is the first child of a <tr> eg <tr> <td>matches this</td> <td>but not this</td> </td>

and various combinations of these.

Effectively, they do "pattern matching."

See Chapter 2 of "CSS The Definitive Guide" if you're curious.

(You're not expected to memorize these for CS 200—this is useful "read and recall [someday] info")

The HTML

```
<html>
<head>
   <title>A Simple Eric Meyer • • • </title>
   <LINK REL="STYLESHEET" HREF="ericMeyer.css">
</head>
<body>

<div class="wrap" id="p1">
   <h1>much room to think</h1>
   <p>
      Sometimes I find myself • • •
   </p>
   <p>
      I suppose it's the taste • • •
   </p>
</div>

<div class="wrap" id="p2">
   <h2>a fun guy</h2>
   <div id="menu">
      <a href="test2.html">stories</a>
      <a href="test3.html">poems</a>
      <a href="test4.html" id="lastlink">art</a>
   </div>
   <p>
      Good evening, my name is Rootsy • • •
   </p>
</div>
```

```
<div class="wrap" id="footer">
   Adapted from "Eric Meyer On CSS,"
   by Eric Meyer, &copy; 2002.
   <br>
   See www.newriders.com &amp;
   www.ericmeyeroncss.com.
</div>

</body>
</html>
```

Notice that attributes can come from more than one style definition

- eg from div.wrap {...} and div#p1 {...}, applied to
- when that happens, they're merged
- if there's a conflict, "the more specific wins"

  eg p1 over wrap because only one tag can have id=p1

Discussion

The "class" attribute can be used by many tags, which share its meaning
The "id" attribute is supposed to uniquely identify a tag (ie only be used once)
Both specify a style to use on their content

Style sheets can come from

- the web page author
- the user, who can often specify a style sheet in the browser's preferences
- the browser (ie builtin)

— And this is their order of priority (from high to low) when a conflict arises for a particular attribute

Browsers are finicky about CSS syntax

- if your CSS seems to have no effect, check for syntax errors / use a CSS validator

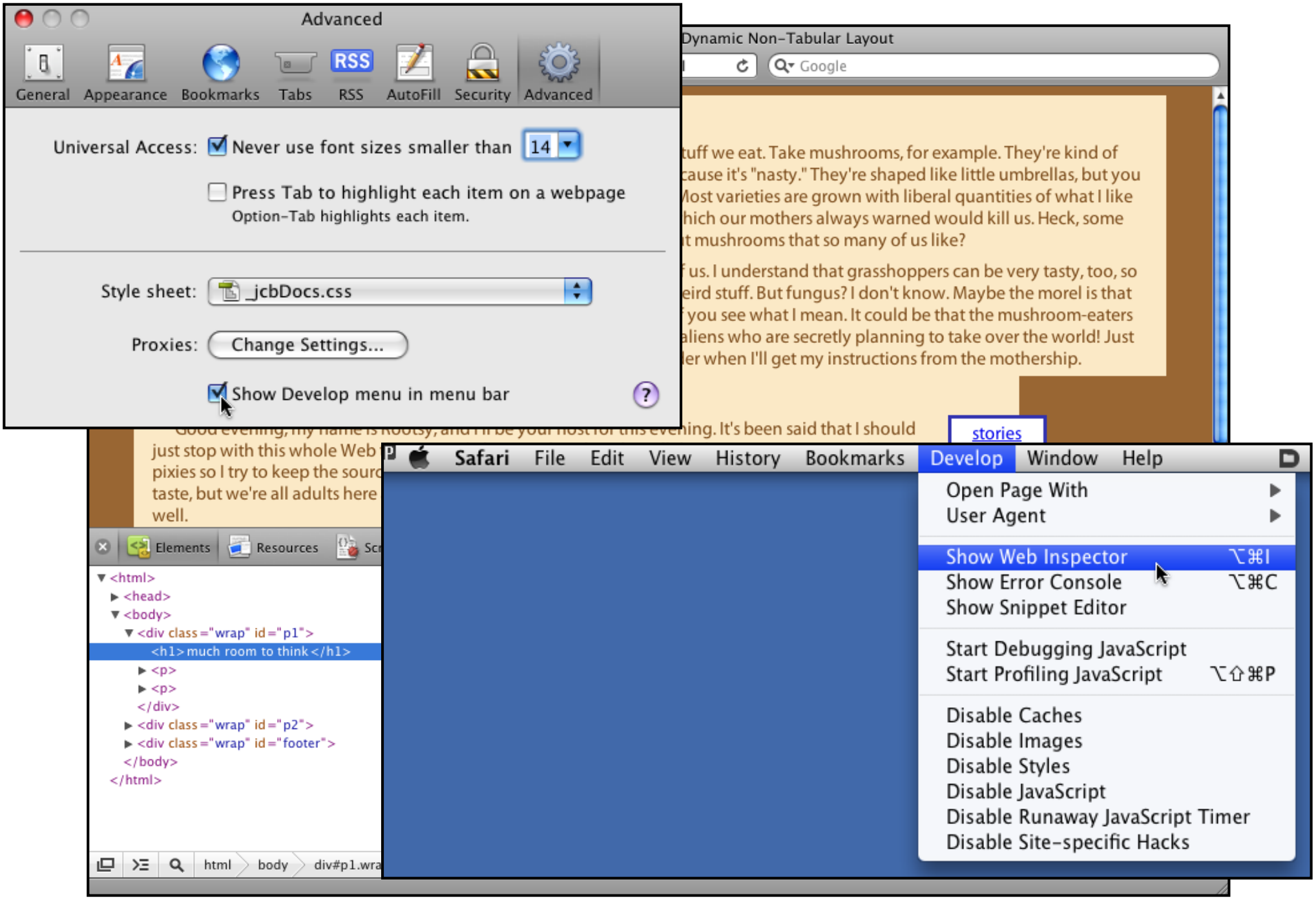
The detailed rules for resolving conflicts are (considerably) more complicated;

- see Section 8.1.9 of "HTML & XHTML - The Definitive Guide," 5/e, for a fuller explanation
- or Chapter 3, "Structure and the Cascade," in *Cascading Style Sheets - The Definitive Guide* for details

— *but you shouldn't need to*

Note: there's a lot more to CSS than we've had time to talk about

Safari's > Show Inspector



For More (Optional) Information on CSS

Western Civilization's

"Complete CSS Guide" at

http://www.westciv.com/style_master/academy/css_tutorial/introduction/css_intro.html

"Properties Introduction" (the Complete CSS Guide's section on CSS attributes) at

http://www.westciv.com/style_master/academy/css_tutorial/properties/index.html

***HTML & XHTML — The Definitive Guide, 5/e,* by Musciano & Kennedy, Chapter 9, "Cascading Style Sheets"**

on reserve in the library (an earlier edition, without "XHTML" in the title

or at http://safari.ora.com > MY BOOKSHELF – Book 26 from a University computer
Chapter 8 "Cascading Style Sheets" & the appendix "Cascading Style Sheet Properties Quick Reference"

(the 6th edition was published in October of 2006)

Cascading Style Sheets — The Definitive Guide, by Eric Meyer

3rd edition, © 2006, O'Reilly & Associates, 0-596-52733-0.

or the 2/e at http://www.safari.ora.com > MY BOOKSHELF – Book 9 from a University computer

Typetester: a neat web page (w/Javascript+CSS) for comparing various fonts side-by-side in your browser

typetester.maratz.com

XyleScope: a neat tool for dissecting the CSS in pages you encounter on the web ($20, Mac only)

www.culturedCode.com/xyle/

The "Lorem ipsum... generator" at http://www.lipsum.com/

TypeTester: typetester.maratz.com

Common Sources of Confusion in the Lab

You can use Firefox or Safari's File > Open File... menu item

- that's effectively what PageSpinner's Preview button / menu item does
- HOWEVER

  File > Open File... is not as fussy about paths as most web servers

  - it won't complain about spaces in URLs
  - it won't complain about trailing blanks in file names

- So you MUST also ask Oscar's web server to access your web pages
  to be certain that the URLs in them work

  http://oscar.cs.uwaterloo.ca/cs200web/cs200section_NNN/yHC_web/www/Root.html

Browsers "cache" (most) pages you have browsed on your local disk

- When you've changed the contents of a page and saved it to your network disk from PageSpinner,
  option-click the Reload button or to ensure your browser REALLY gets the new version

And a word of advice ... use

- closing tags (eg </TD>, </P>)
- indentation
- blank lines

to structure your HTML
— it makes debugging *much* easier

Finally...

Remember that <head> does NOT mean <header>

- <head> ... </head>

  enclose information ABOUT the web page

  that is not displayed IN the page

- <style> ... </style> illustrates this better than <title>...</title>

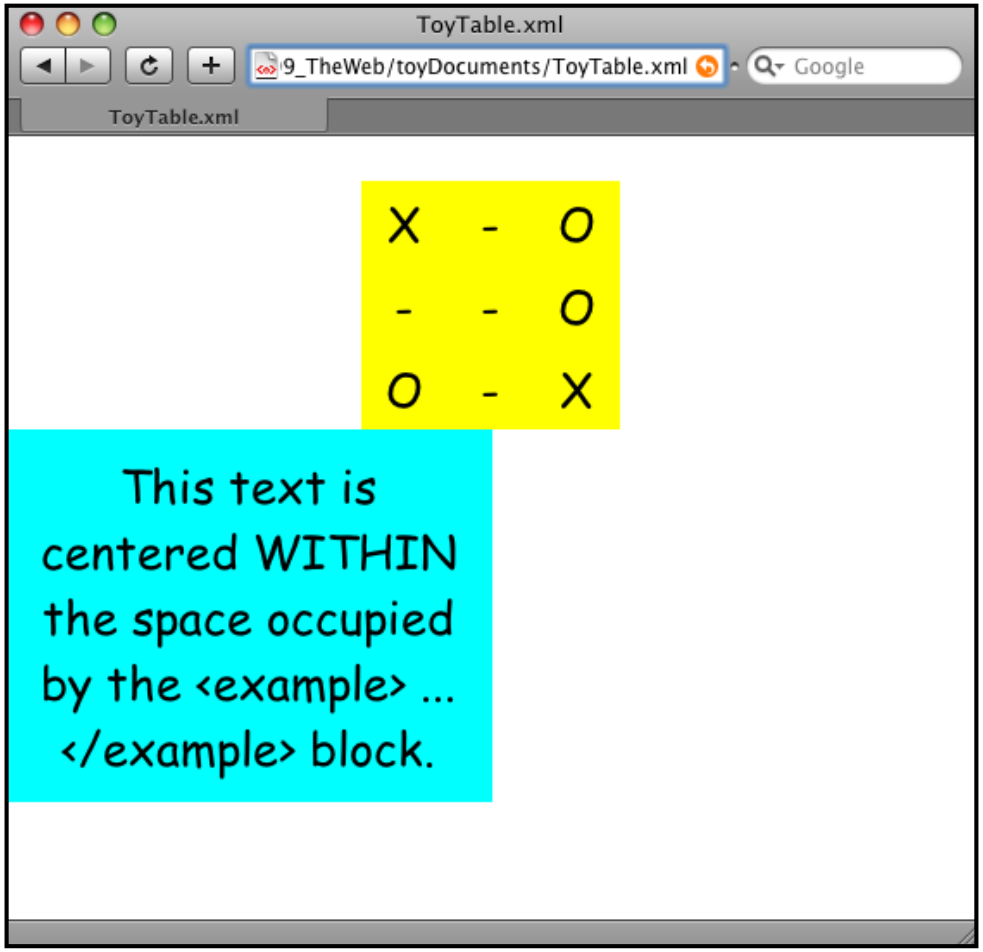
Most browsers have a "View > Source..." menu item
that will show you the HTML source for the page currently being displayed

Warning

- CSS is still not perfectly implemented by contemporary browsers, although the situation is much better now than it was a few years ago
- So ***use the latest release of whatever browser you like when experimenting with Cascading Style Sheets***
- Also, StyleMaster has lots of info about browser quirks & bugs

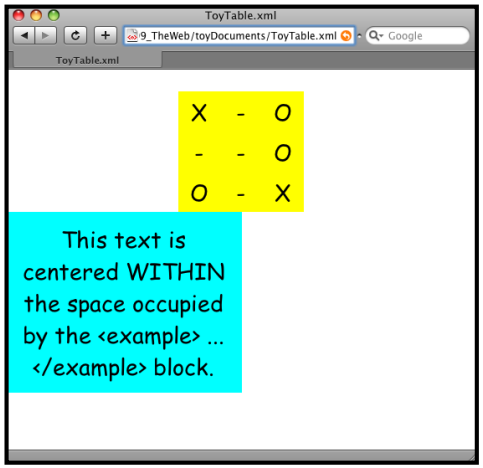
XML

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/css" href="ToyTable.css"?>

<doc>

   <xmlTable>
      <row>
         <cell>X</cell>
         <cell>-</cell>
         <cell>O</cell>
      </row>
      <row>
         <cell>-</cell>
         <cell>-</cell>
         <cell>O</cell>
      </row>
      <row>
         <cell>O</cell>
         <cell>-</cell>
         <cell>X</cell>
      </row>
   </xmlTable>

   <example>
      This text is centered WITHIN
      the space occupied by the
      &lt;example&gt; ... &lt;/example&gt; block.
   </example>

</doc>
```



ToyTable.css

```
doc {
    font-family:      "Comic Sans MS", sans-serif;
    font-size:        20pt;
}
xmlTable {
    display:          table;
    color:            black;
    background-color:  yellow;
        margin-top:       1em;
    margin-left:      auto;
    margin-right:     auto;
}
row {
    display:          table-row;
}
cell {
    display:          table-cell;
    padding-right:    0.2em;
    padding-left:     0.2em;
    padding-top:      0.2em;
    padding-bottom:   0.2em;
    width:            1.5em;
    text-align:       center;
}
example {
        display:          block;
        padding:          0.5em;
        background-color:  cyan;
        margin-left:      0%;
        margin-right:     50%;
        text-align:       center;
}
```



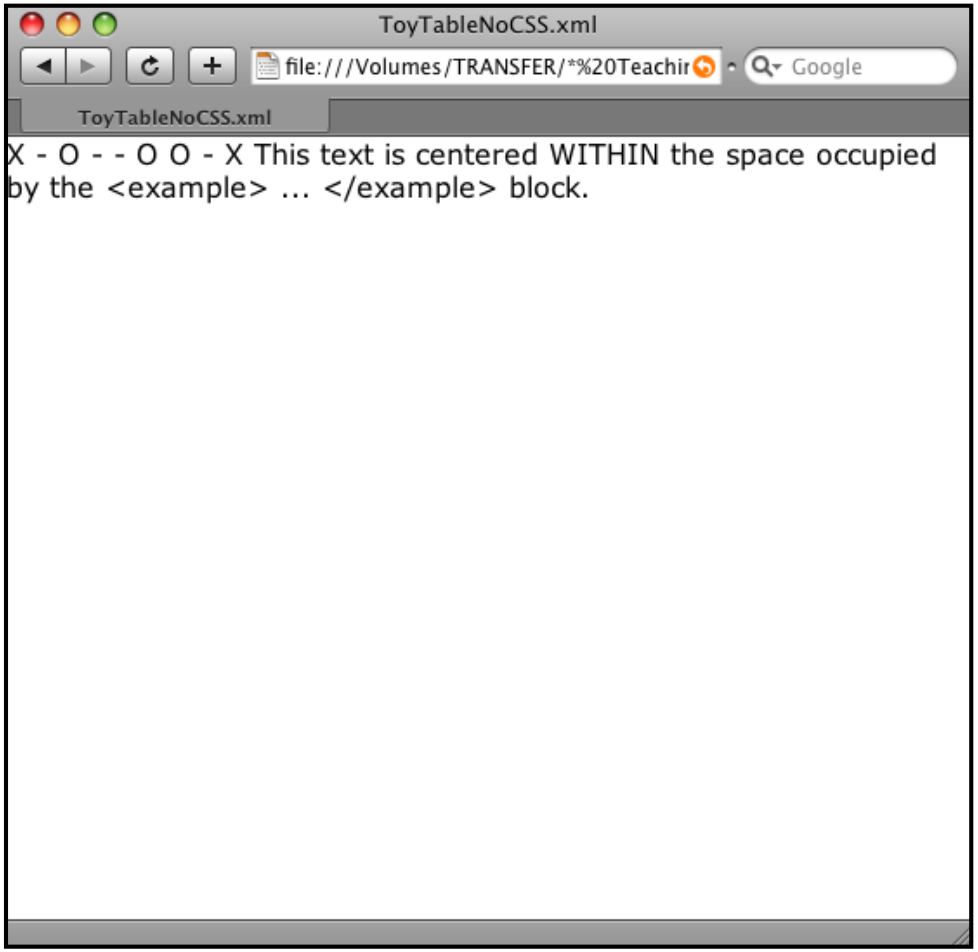
Use LR margins of auto to center a **block-level** element within its parent.

Use text-align: center to center text **within** an element.

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/css" href="ToyTable.css"?>

<doc>

  <xmlTable>
    <row>
      <cell>X</cell>
      <cell>-</cell>
      <cell>O</cell>
    </row>
    <row>
      <cell>-</cell>
      <cell>-</cell>
      <cell>O</cell>
    </row>
    <row>
      <cell>O</cell>
      <cell>-</cell>
      <cell>X</cell>
    </row>
  </xmlTable>

  <example>
    This text is centered WITHIN
    the space occupied by the
    &lt;example&gt; ... &lt;/example&gt; block.
  </example>

</doc>
```

XML—w/o the <?xml-stylesheet ... ?>

```
<?xml version="1.0" encoding="UTF-8"?>


<doc>

   <xmlTable>
      <row>
         <cell>X</cell>
         <cell>-</cell>
         <cell>O</cell>
      </row>
      <row>
         <cell>-</cell>
         <cell>-</cell>
         <cell>O</cell>
      </row>
      <row>
         <cell>O</cell>
         <cell>-</cell>
         <cell>X</cell>
      </row>
   </xmlTable>

   <example>
      This text is centered WITHIN
      the space occupied by the
      &lt;example&gt; ... &lt;/example&gt; block.
   </example>

</doc>
```



CSS + JavaScript To Change The Default Font

S ?

Example: changing the font locally

- local: http://127.0.0.1/cs200/switchingFontsWithJavascript/JensHomePage.html
- remote: http://jcbserver.cs.uwaterloo.ca/cs200/switchingFontsWithJavascript/JensHomePage.html

The Javascript for this Example

S ?

```
<HTML>
<HEAD>
   <TITLE>Jen's Fake Home Page</TITLE>
</HEAD>

<BODY id="all" bgcolor="#FFFFFF" style="font-family: Arial, sans-serif;">

• • •

<h2>Choose A Font</h2>
<p>
   <form>

      <input type="radio" name="chooseFont"
         checked
         onclick="elt = document.getElementById('all'); elt.style.fontFamily='Arial, sans-serif';">
      Arial

      <input type="radio" name="chooseFont"
         onclick="elt = document.getElementById('all'); elt.style.fontFamily='Palatino, serif';">
      Palatino

      <input type="radio" name="chooseFont"
         onclick="elt = document.getElementById('all'); elt.style.fontFamily='Comic Sans MS, cursive';">
      Comic Sans MS

   </form>
</p>

</BODY>
</HTML>
```

Notice that the CSS attribute“font-family” becomes “fontFamily” in Javascript
because “-” is illegal in a variable name.

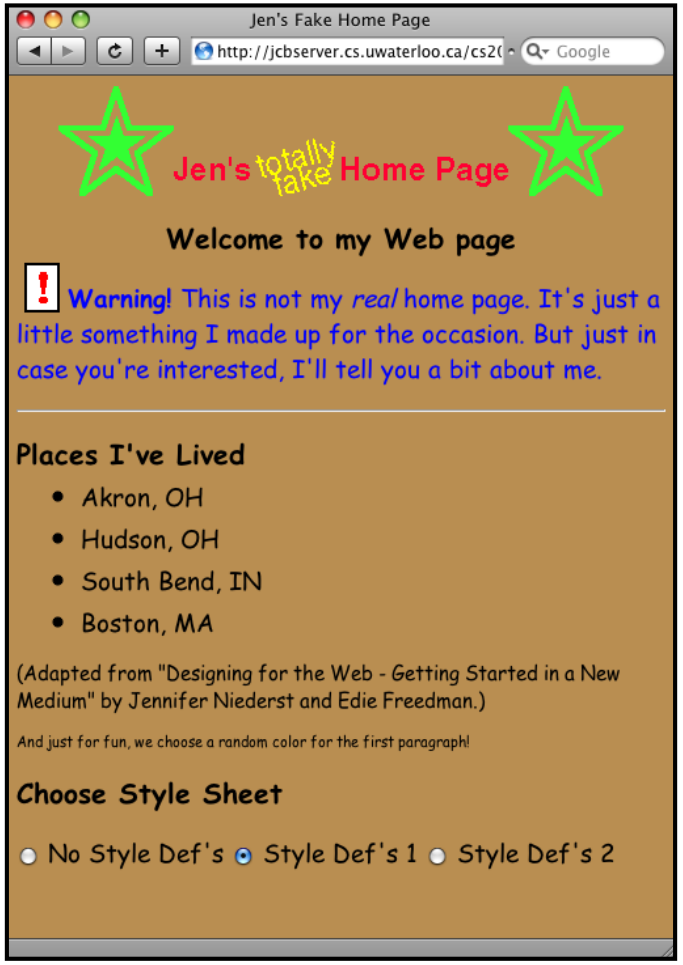
Think about Excel scripting as you read this JavaScript.

CSS + JavaScript To Switch Style Sheets

S ?

Example: switching style sheets dynamically

- local: http://127.0.0.1/cs200/switchingStyleSheets/JensHomePage.html
- remote: http://jcbserver.cs.uwaterloo.ca/cs200/switchingStyleSheets/JensHomePage.html



See JensHomePage.html and the javascript source file global.js in .../cs200/switchingStyeSheets/ for details if you're curious.
(Note that the color of the "Warning!" paragraph is chosen randomly.)

CSS + JavaScript

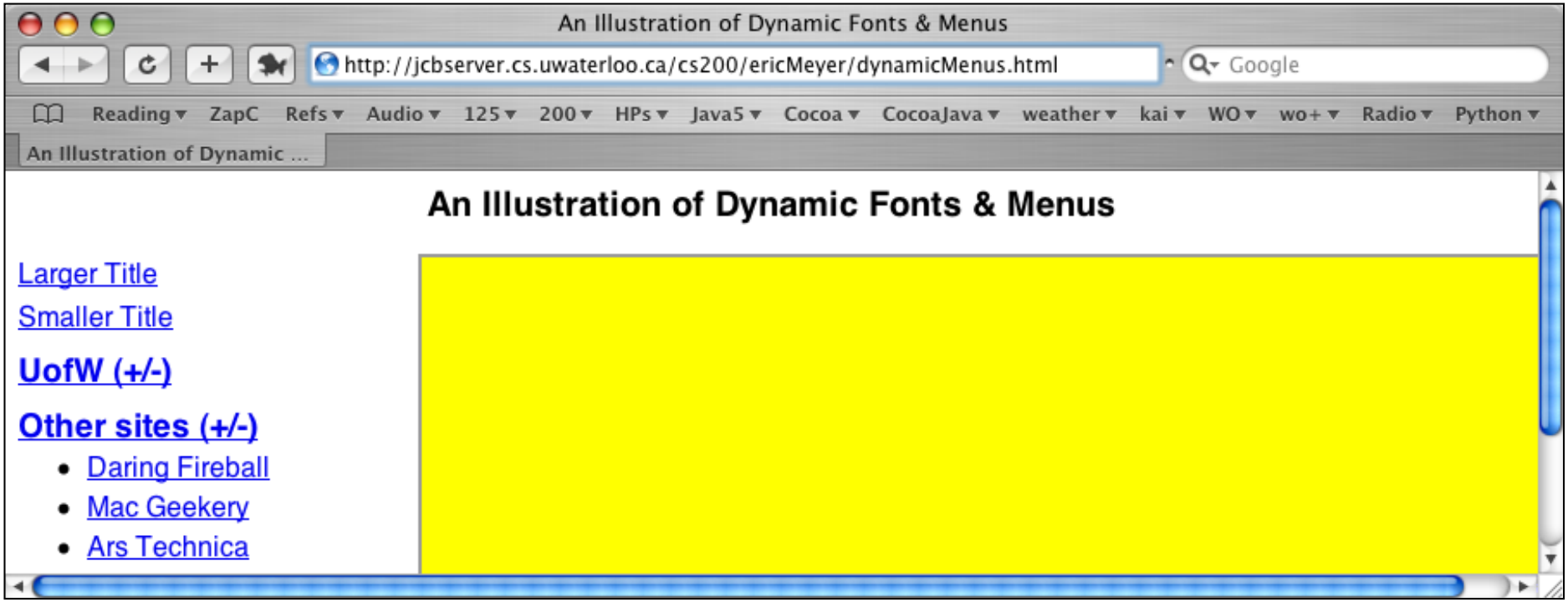
S ?

Adding a little JavaScript to CSS (of the sort covered in CS 100)

- dynamically changing CSS attributes
- collapsing menus
- absolute positioning of layers (remember Photoshop & Illustrator?)
- and much, much more

Example:

- local: http://127.0.0.1/dynamicMenus.html
- remote: http://jcbServer.cs.uwaterloo.ca/cs200/ericMeyer/dynamicMenus.html



The CSS for this Example

S ?

```
<html>
<head>

    <title>An Illustration of Dynamic Fonts &amp;amp; Menus</title>

    <style type="text/css">
        <!--
            body     { font-family:      sans-serif; }
            #menuOne { display:          none;       }
            #menuTwo { display:          none;       }
            #title   {
                       font-size:        15pt;
                       font-weight:      bold;
                       margin-bottom:    15pt;
                       text-align:       center;
                     }
            #content {
                       position:         absolute;
                       left:             2.5in;
                       top:              0.5in;
                       background-color: #FFFF00;
                       padding:          25px;
                     }
        -->
    </style>
```

The Content for this Example

S ?

```
<body>

    <div id="title"> An Illustration of Dynamic Fonts &amp;amp; Menus </div>

    <p><A href="#" onclick="changeFontSize(+3);">Larger Title</a></p>
    <p><A href="#" onclick="changeFontSize(-3);">Smaller Title</a></p>

    <h3><a href="#" onclick="toggleMenu('menuOne');"> UofW (+/-)</a> </h3>

    <ul id="menuOne">
        <li> <a href="#" onclick="setContentTo('http://www.cs.uwaterloo.ca/'            );"> CS          </a> </li>
        <li> <a href="#" onclick="setContentTo('http://jcbServer.cs.uwaterloo.ca/cs200/');"> CS 200      </a> </li>
        <li> <a href="#" onclick="setContentTo('http://jcbServer.cs.uwaterloo.ca/cs230/');"> CS 230      </a> </li>
        <li> <a href="#" onclick="setContentTo('http://jcbServer.cs.uwaterloo.ca/cs436/');"> CS 436      </a> </li>
        <li> <a href="#" onclick="setContentTo('http://jcbServer.cs.uwaterloo.ca/'      );"> jcbServer   </a> </li>
        <li> <a href="#" onclick="setContentTo('http://www.math.uwaterloo.ca/'         );"> Math        </a> </li>
        <li> <a href="#" onclick="setContentTo('http://oscar.cs.uwaterloo.ca/'         );"> Oscar       </a> </li>
        <li> <a href="#" onclick="setContentTo('http://www.uwaterloo.ca/'              );"> UofW        </a> </li>
    </ul>

    <h3><a href="#" onclick="toggleMenu('menuTwo');"> Other sites (+/-)</a> </h3>

    <ul id="menuTwo">
        <li> <a href="#" onclick="setContentTo('http://daringfireball.net/'            );"> Daring Fireball </a> </li>
        <li> <a href="#" onclick="setContentTo('http://www.macgeekery.com/'            );"> Mac Geekery     </a> </li>
        <li> <a href="#" onclick="setContentTo('http://arstechnica.com/index.ars'      );"> Ars Technica    </a> </li>
        <li> <a href="#" onclick="setContentTo('http://www.slashdot.com/'              );"> Slashdot        </a> </li>
        <li> <a href="#" onclick="setContentTo('http://www.apple.com/'                 );"> Apple           </a> </li>
        <li> <a href="#" onclick="setContentTo('http://www.microsoft.com/'             );"> Microsoft       </a> </li>
        <li> <a href="#" onclick="setContentTo('http://www.mozilla.org/'               );"> Mozilla         </a> </li>
    </ul>

    <IFRAME id="content" SRC="" width="70%" height="100%">
        Oops ... this browser doesn't implement the IFRAME tag.
    </IFRAME>

</body>
</html>
```

Adapted from Section 6.13 of "The CSS Cookbook," by Christopher Schmitt, O'Reilly & Associates.

See also the documentation for CSS attributes in the "CSS Pocket Reference."

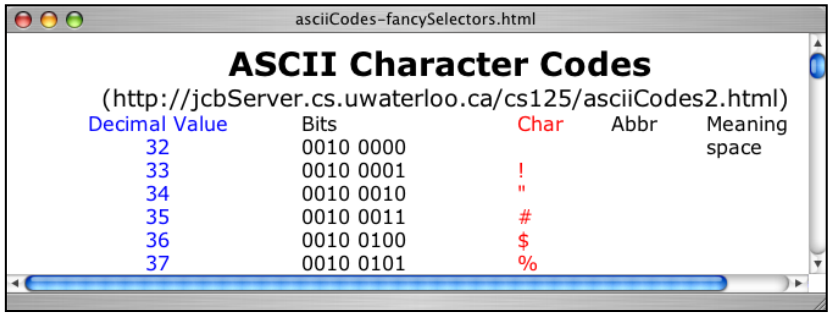
The JavaScript for this Example

S ?

```
<script language="JavaScript">

    var currentFontSize = 15;
    function changeFontSize( delta ) {
        var titleElement      = document.getElementById("title").style;
        currentFontSize       = currentFontSize + delta;
        titleElement.fontSize = currentFontSize + "pt";
    }

    function toggleMenu( menuClicked ) {
        processOneMenu( "menuOne", menuClicked );
        processOneMenu( "menuTwo", menuClicked );
    }

    function processOneMenu( menuToCheck, menuClicked ) {
        var menuClickedStyles = document.getElementById(menuClicked).style;
        var menuToCheckStyles = document.getElementById(menuToCheck).style;
        if( menuClicked == menuToCheck ) {
            if( menuClickedStyles.display == "block" ) {
                menuClickedStyles.display = "none";
            } else {
                menuClickedStyles.display = "block";
            }
        } else {
            menuToCheckStyles.display = "none";
        }
    }

    function setContentTo( theURL ) {
        var theDiv = document.getElementById("content");
        theDiv.src = theURL;
    }

</script>

</head>
```

An example of "exotic selectors" in use

```
<html>
<head>
   <style>
      <!--
         td#title                { color: black;                    }
         tr > td:first-child     { color: blue; text-align: center; }
         tr > td + td + td       { color: red;                      }
         tr > td + td + td + td  { color: black;                    }
      -->
   </style>
</head>

<body>

<table align='center' border=0 cellpadding=0 cellspacing=0 width=707>

 <tr>
   <td colspan=5 align=center id="title">
      <span style="font-size: 20pt; font-weight: bold;">
         ASCII Character Codes
      </span>
      <br>
      <span style="font-size: 14pt; font-weight=normal;">
         (http://jcbServer.cs.uwaterloo.ca/cs125/asciiCodes2.html)
      </span>
   </td>
 </tr>

 <tr>
     <td>Decimal Value</td>
     <td><a name=table>Bits</a></td>
     <td>Char</td>
     <td>Abbr</td>
     <td>Meaning</td>
 </tr>
```




```
 <tr>
    <td>32</td>
    <td>0010 0000</td>
    <td> </td>
    <td></td>
    <td>space</td>
 </tr>
 <tr>
    <td>33</td>
    <td>0010 0001</td>
    <td>!</td>
    <td></td>
    <td></td>
 </tr>
 <tr>
    <td>34</td>
    <td>0010 0010</td>
    <td>&quot;</td>
    <td></td>
    <td></td>
 </tr>
 <tr>
    <td>35</td>
    <td>0010 0011</td>
    <td>#</td>
    <td></td>
    <td></td>
 </tr>
 • • •
</table>

</body>

</html>
```