Lecture01: Introduction to Web 2.0 and HTML

EGCI427: Week01

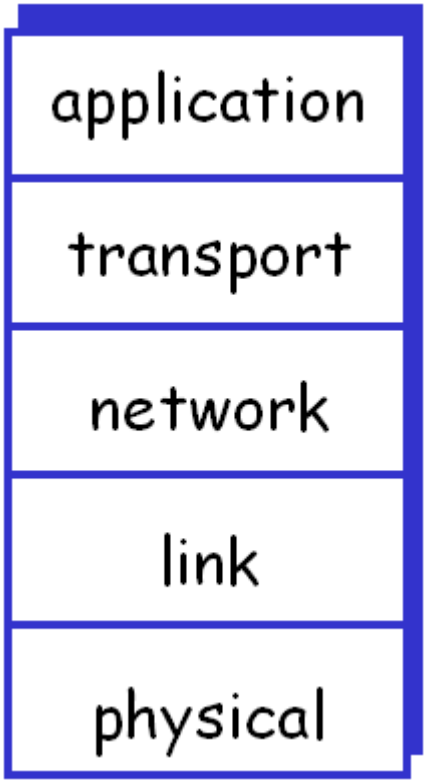
Background

What is the Internet?

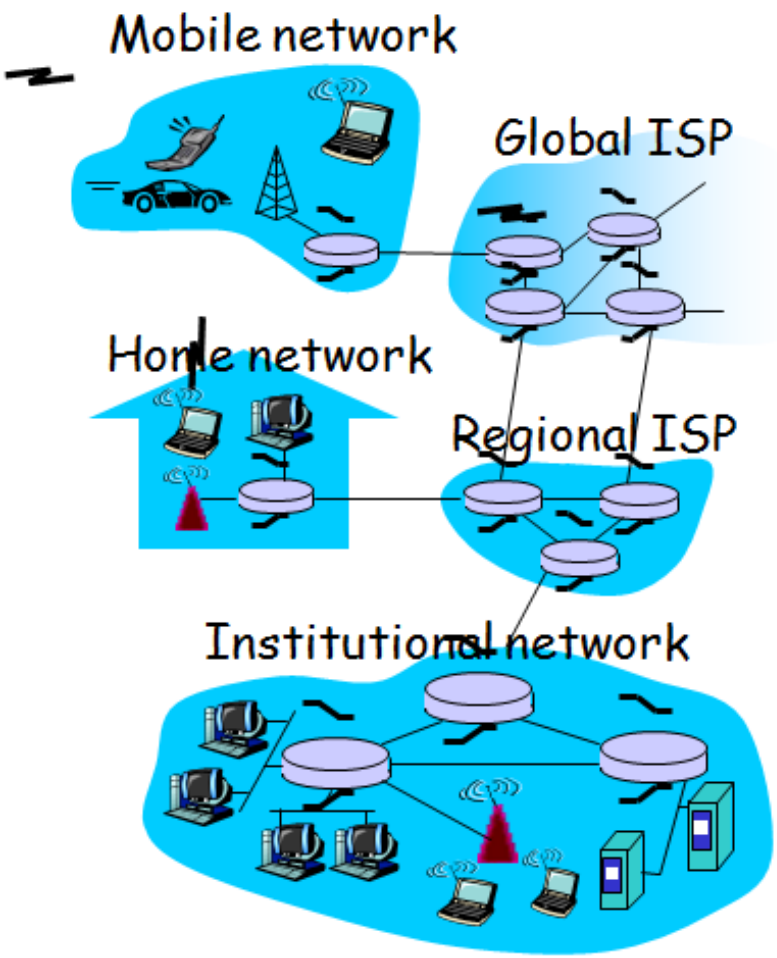
- A world-wide network of computer networks
- At the lowest level, since 1982, all connections use TCP/IP
- TCP/IP hides the differences among devices connected to the Internet

Internet protocol stack

- application: supporting network applications
  - FTP, SMTP, HTTP
- transport: process-process data transfer
  - TCP, UDP
- network: routing of datagrams from source to destination
  - IP, routing protocols
- link: data transfer between neighboring network elements
  - PPP, Ethernet
- physical: bits "on the wire"



Today's Internet



Internet Protocol

- Internet Protocol (IP) Addresses
  - Every node has a unique numeric address
  - Form: 32-bit binary number
    - New standard, IPv6, has 128 bits (1998)

- Organizations are assigned groups of IPs for their computers

Internet Protocol

- Domain names
  - Form: host-name.domain-names
  - First domain is the smallest; last is the largest
  - Last domain specifies the type of organization
  - Fully qualified domain name - the host name and all of the domain names
  - DNS servers - convert fully qualified domain names to IPs

Some Web/Network Applications

- e-mail
- web
- instant messaging
- remote login
- P2P file sharing
- multi-user network games
- streaming stored video clips
- voice over IP
- real-time video conferencing

Web or Internet?

- They are not the same!
- The Internet
  - A collection of computers and devices connected by equipment that allows them to communicate with each other
  - A network (the largest one!)
- The Web is a collection software and protocols that has been installed on computers on the Internet

Internet and WWW

- What is Web2.0?
- "Web 2.0 is the business revolution in the computer industry caused by the move to the Internet as a platform, and an attempt to understand the rules for success on that new platform" (Tim O'Reilly, 2006)
- Example of Web 2.0
  - AJAX web applications such as Google Maps

    AJAX = Asynchronous JavaScript and XML
  - Web Social Networking such as Facebook

*Social Networking Website (2007)

Facebook :	140,000,000 registers
MySpace :	253,145,404 registers
Windows Live Spaces:	120,000,000 registers

*Social Networking Website (2012)

Facebook:	750,000,000
Twitter:	250,000,000
LinkedIn:	110,000,000

Internet and WWW

- What are the differences between Web 1.0 and Web 2.0?

- **Web 1.0**
  - One way communication: Server can publish/post the contents on the internet
  - One client - One server architecture (one account can access only one web server/website)

- **Web 2.0**
  - Interactive communication: Both clients/users and server can post the contents on the internet
  - Multi client-server architecture (Many-to-Many)
  - (one account can access more than one web server/website)

Internet and WWW (cont.)

Web 1.0	**and**	**Web 2.0**
Britannica Online	-->	Wikipedia
personal websites	-->	blogging
screen scraping	-->	web services
publishing	-->	participation
content management systems	-->	wikis
directories (taxonomy)	-->	tagging

Push-Pull Technology

- Pull Publishing
  - Most information retrieval on the Web is through "pull" publishing
  - For example, RSS, Feed

- Push Publishing
  - i.e. stock price announcements and sports scores
  - Used for all types of things to keep Web consumers informed
    - For example, sale information, stock tickers, updates to your Web site

Web Applications Development

Markup Language

- *XML/XSLT/XSD*
- HTML
- RSS and GeoRSS
- EBML (e-business XML)

Programming Language

- CGI/Perl /PHP(sever)
- AJAX (plugin)
- Java/Javascript(plugin)

- *XML = Extended Markup Language*
- *XSLT = XML Style sheet (Form/Presentation/Report)*
- *Xpath = XML query (like SQL)*
- *XSD = XML schema (like database/table structure)*

Web Browsers

- Browsers are clients - always initiate, servers react (although sometimes servers require responses)

- Most requests are for existing documents, using HyperText Transfer Protocol (HTTP)
  - But some requests are for program execution, with the output being returned as a document

Web Server

- Provide responses to browser requests, either existing documents or dynamically built documents
- Browser-server connection is now maintained through more than one request-response cycle
- All communications between browsers and servers use Hypertext Transfer Protocol (HTTP)
- Operation:
  - Web servers run as background processes in the operating system
    - Monitor a communications port on the host, accepting HTTP messages when they appear

Web and HTTP

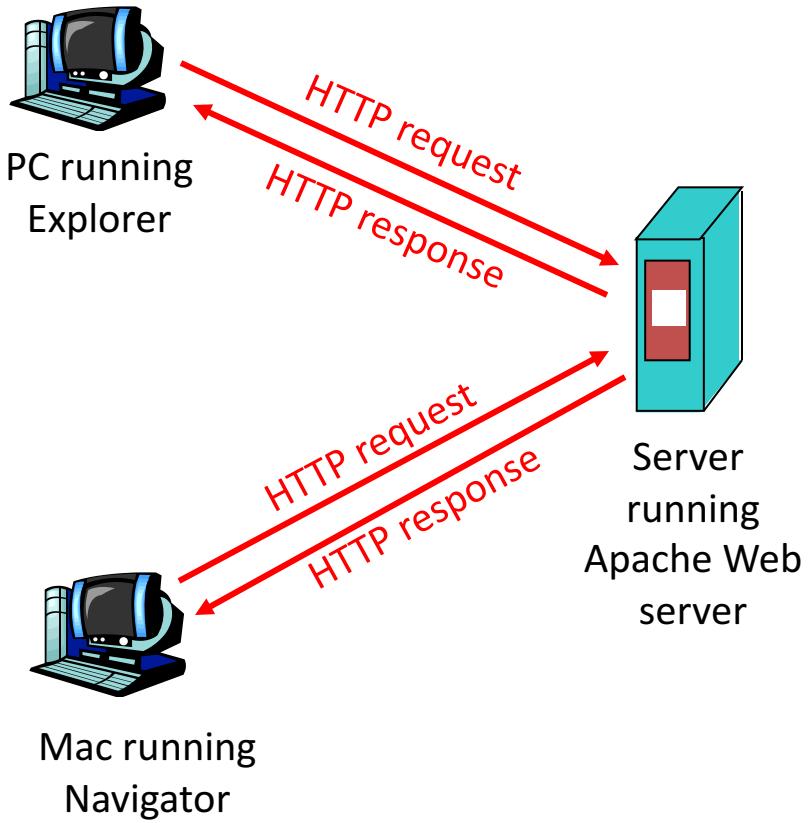
- Web page consists of objects
- Object can be HTML file, JPEG image, Java applet, audio file,…
- Web page consists of base HTML-file which includes several referenced objects
- Each object is addressable by a URL
- Example URL:

$$\underbrace{\texttt{www.someschool.edu}}_{\text{host name}}\underbrace{\texttt{/someDept/pic.gif}}_{\text{path name}}$$

HTTP overview

HTTP: hypertext transfer protocol

- Web's application layer protocol
- client/server model
  - *client:* browser that requests, receives, "displays" Web objects
  - *server:* Web server sends objects in response to requests



HTTP request message

- two types of HTTP messages: *request, response*
- HTTP request message:
  - ASCII (human-readable format)

request line (GET, POST, HEAD commands)

```
GET /somedir/page.html HTTP/1.1
Host: www.someschool.edu
User-agent: Mozilla/4.0
Connection: close
Accept-language:fr
```

header lines

Carriage return, line feed indicates end of message

(extra carriage return, line feed)

Method types

HTTP/1.0

- GET
- POST
- HEAD
  - asks server to leave requested object out of response

HTTP/1.1

- GET, POST, HEAD
- PUT
  - uploads file in entity body to path specified in URL field
- DELETE
  - deletes file specified in the URL field

HTTP response message

status line (protocol status code status phrase)

header lines

data, e.g., requested HTML file

```
HTTP/1.1 200 OK
Connection close
Date: Thu, 06 Aug 1998 12:00:15 GMT
Server: Apache/1.3.0 (Unix)
Last-Modified: Mon, 22 Jun 1998 …...
Content-Length: 6821
Content-Type: text/html

data data data data data ...
```

HTTP response status codes

200 OK

- request succeeded, requested object later in this message

301 Moved Permanently

- requested object moved, new location specified later in this message (Location:)

400 Bad Request

- request message not understood by server

404 Not Found

- requested document not found on this server

505 HTTP Version Not Supported

A basic web page – HTML

- A browser requests a document on a web server
- A web server sends the document to the browser
- The browser interprets the document which was sent in the form of HTML

Origins and Evolution of HTML

- HTML was defined with SGML (Standard Generalized Markup Language)
- Original intent of HTML: General layout of documents that could be displayed by a wide variety of computers
- Recent versions:
  - HTML 4.0 – 1997
    - Introduced many new features and deprecated many older features
  - HTML 4.01 - 1999 - A cleanup of 4.0
  - HTML 5.0 – Draft version
  - XHTML 1.0 - 2000
    - Just 4.01 defined using XML, instead of SGML
  - XHTML 1.1 – 2001
    - Modularized 1.0, and drops frames
    - We'll stick to 1.1, except for frames
  - XHTML 2.0 and XHTML 5.0 – Draft version

Origins and Evolution of HTML (continued)

- Reasons to use XHTML, rather than HTML:
  1. HTML has lax syntax rules, leading to sloppy and sometime ambiguous documents
     – XHTML syntax is much more strict, leading to clean and clear documents in a standard form
  2. HTML processors do not even enforce the few syntax rule that do exist in HTML
  3. The syntactic correctness of XHTML documents can be validated

Basic Syntax

- Elements are defined in tags (markers)
  - Tag format:
    - Opening tag: <name>
    - Closing tag: </name>
  - The opening tag and its closing tag together specify a container for the content they enclose

Basic Syntax (continued)

- Not all tags have content
  - If a tag has no content, its form is <name />
- The container and its content together are called an *element*
- If a tag has attributes, they appear between its name and the right bracket of the opening tag
- Comment form: <!-- ... -->
- Browsers ignore comments, unrecognizable tags, line breaks, multiple spaces, and tabs
- Tags are suggestions to the browser, even if they are recognized by the browser

Self-study Section

XHTML Document Structure

- Every XHTML document must begin with:

  <?xml version = ”1.0”?>

  <!DOCTYPE html PUBLIC ”-//w3c//DTD XHTML 1.1//EN”

  http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd>
- <html>, <head>, <title>, and <body> are required in every document
- The whole document must have <html> as its root
- html must have the xmlns attribute:

  <html xmlns = ”http://www.w3.org/1999/xhtml”
- A document consists of a head and a body
- The <title> tag is used to give the document a title, which is normally displayed in the browser’s window title bar (at the top of the display)
- Prior to XHTML 1.1, a document could have either a body or a frameset

Basic Text Markup

- Text is normally placed in paragraph elements
- *Paragraph Elements*
  - The <p> tag breaks the current line and inserts a blank line - the new line gets the beginning of the content of the paragraph
  - The browser puts as many words of the paragraph's content as will fit in each line

```
<?xml version = "1.0"?>
 <!DOCTYPE html PUBLIC "-//w3c//DTD XHTML 1.1//EN"
   http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd>
<!-- greet.html
    A trivial document
    -->
<html xmlns = "http://www.w3.org/1999/xhtml">
 <head> <title> Our first document </title>
 </head>
 <body>
   <p>
    Greetings from your Webmaster!
   </p>
 </body>
</html>
```

Basic Text Markup (continued)

- W3C HTML Validation Service

  http://validator.w3.org/file-upload.html

- Line breaks
  - The effect of the <br /> tag is the same as that of , except for the blank line
    - No closing tag!

- Example of paragraphs and line breaks

  On the plains of hesitation bleach the
  bones of countless millions
  who, at the dawn of victory <br /> sat down
  to wait, and waiting, died.

- Typical display of this text:

  On the plains of hesitation

  bleach the bones of countless millions

  who, at the dawn of victory
  sat down to wait, and waiting, died.

Basic Text Markup (continued)

- Preserving Whitespace
  - Preventing the browser from eliminating multiple spaces and ignoring embedded line breaks
- Try this!

```
<p> <pre>
Mary
            had a
                    little
                            lamb
</pre>  </p>
```

- Note that a pre-element can contain virtually any other tags, except those that cause a paragraph break, such as paragraph elements

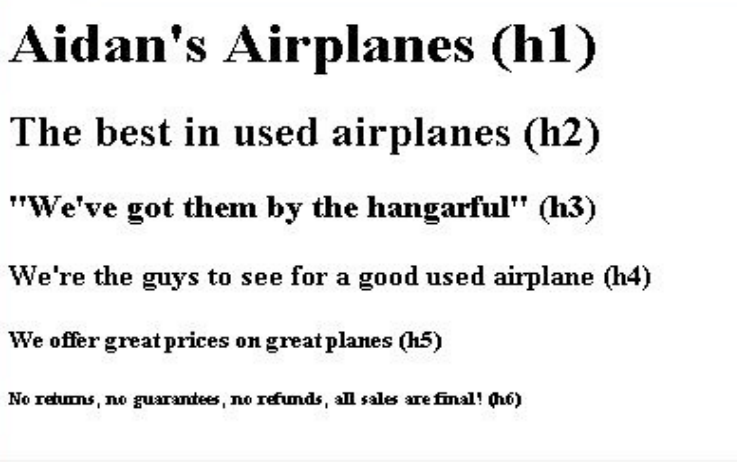
Basic Text Markup (continued)

- Headings
  - Six sizes (levels), 1 - 6, specified with <h1> to <h6>
  - 1, 2, and 3 use font sizes that are larger than the default font size
  - 4 uses the default size
  - 5 and 6 use smaller font sizes

```
<!-- headings.html
     An example to illustrate headings
     -->
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head> <title> Headings </title>
  </head>
  <body>
    <h1> Aidan's Airplanes (h1) </h1>
    <h2> The best in used airplanes (h2) </h2>
    <h3> "We've got them by the hangarful" (h3)
    </h3>
    <h4> We're the guys to see for a good used
         airplane (h4) </h4>
    <h5> We offer great prices on great planes
         (h5) </h5>
    <h6> No returns, no guarantees, no refunds,
         all sales are final (h6) </h6>
  </body>
</html>
```

Basic Text Markup (continued)

```
<!-- headings.html
     An example to illustrate headings
     -->
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head> <title> Headings </title>
  </head>
  <body>
    <h1> Aidan's Airplanes (h1) </h1>
    <h2> The best in used airplanes (h2) </h2>
    <h3> "We've got them by the hangarful" (h3)
    </h3>
    <h4> We're the guys to see for a good used
         airplane (h4) </h4>
    <h5> We offer great prices on great planes
         (h5) </h5>
    <h6> No returns, no guarantees, no refunds,
         all sales are final (h6) </h6>
  </body>
</html>
```



Basic Text Markup (continued)

- Blockquotes – <blockquote> </blockquote>
  - To set a block of text off from the normal flow and appearance of text
  - Browsers often indent, and sometimes italicize
- blockquote.html

Basic Text Markup (cont.)

- Font Styles and Sizes (can be nested)
  - Boldface - <b>
  - Italics - <i>
  - Larger - <big>
  - Smaller - <small>
  - Emphasis -
  - Strong -
    - Browsers usually set the content to bold
  - Code - <code>
    - Specify a monospace font, usually program code

- Later you'll see that <i> and <b> are hardly used these days due to the advent of cascading style sheet (next week!)

Basic Text Markup (cont.)

```
The <big> sleet <big> in <big> <i> Crete
</i><br /> lies </big> completely </big>
in </big> the street
```

The sleet in *Crete*

lies completely in the street

- These tags are not affected if they appear in the content of a <blockquote>, unless there is a conflict (e.g., italics)

- *Superscripts and subscripts*
  - Subscripts with <sub>
  - Superscripts with <sup>

Example: x₂³

Display: x_2^3

Basic Text Markup (cont.)

- All of this font size and font style stuff can be done with style sheets, but these tags are not yet deprecated
- Character Entities

Char.	*Entity*	*Meaning*
&	`&`	Ampersand
<	`<`	Less than
>	`>`	Greater than
″	`"`	Double quote
′	`'`	Single quote
¼	`¼`	One quarter
½	`½`	One half
¾	`¾`	Three quarters
°	`°`	Degree
(space)	` `	Non-breaking space

Basic Text Markup (cont.)

- Horizontal rules
  - <hr /> draws a line across the display, after a line break

- The meta element (for search engines)
  - Used to provide additional information about a document, with attributes
  - No content

Images

- GIF (Graphic Interchange Format)
  - 8-bit color (256 different colors)
- JPEG (Joint Photographic Experts Group)
  - 24-bit color (16 million different colors)
- Both use compression, but JPEG compression is better
- Portable Network Graphics (PNG)
  - Relatively new
  - Should eventually replace both gif and jpeg
- Images are inserted into a document with the <img /> tag
  - with the *src* attribute specifying the file location
  - The *alt* attribute is required by XHTML
    - Specifies text for non-graphical browsers or browsers with images turned off

```
<img src = "comets.jpg"  alt = "Picture of comets" />
```

- The <img> tag has 30 different attributes, including width and height (in pixels)

Images (cont.)

```
<!-- image.html
     An example to illustrate an image
     -->
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head> <title> Images </title>
  </head>
  <body>
    <h1> Aidan's Airplanes </h1>
    <h2> The best in used airplanes </h2>
    <h3> "We've got them by the hangarful"
    </h3>
    <h2> Special of the month </h2>
    <p>
      1960 Cessna 210 <br />
      577 hours since major engine overhaul
      <br />
      1022 hours since prop overhaul
      <br /><br />
      <img src = "c210new.jpg"
           alt = "Picture of a Cessna 210"/>
      <br />
      Buy this fine airplane today at a
      remarkably low price <br />
      Call 999-555-1111 today!
    </p>
  </body>
</html>
```

Images (continued)

Aidan's Airplanes

The best in used airplanes

"We've got them by the hangarful"

Special of the month

1960 Cessna 210
577 hours since major engine overhaul
1022 hours since prop overhaul

Buy this fine airplane today at a remarkably low price
Call 999-555-1111 today!

Hypertext Links

- Hypertext is the essence of the Web!

- A link is specified with the href (hypertext reference) attribute of <a> (the anchor tag)
  - The content of <a> is the visual link in the document
  - Target in same directory simply put file name i.e. abc.html
  - Target is not in the same directory uses the relative address (UNIX style) i.e. airplanes/abc.html

- Note: Relative addressing of targets is easier to maintain and more portable than absolute addressing

Hypertext Links (continued)

```
<!-- link.html
     An example to illustrate a link
     -->
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head> <title> Links </title>
  </head>
  <body>
    <h1> Aidan's Airplanes </h1>
    <h2> The best in used airplanes </h2>
    <h3> "We've got them by the hangarful"
    </h3>
    <h2> Special of the month </h2>
    <p>
      1960 Cessna 210 <br />
      <a href = "C210data.html">
        Information on the Cessna 210 </a>
    </p>
  </body>
</html>
```

Hypertext Links (continued)

Aidan's Airplanes

The best in used airplanes

"We've got them by the hangarful"

Special of the month

1960 Cessna 210
Information on the Cessna 210

1960 Cessna 210 Information

577 hours since major engine overhaul
622 hours since prop overhaul

Buy this fine airplane today at a remarkably low price
Call 999-555-1111 today!

Hypertext Links (continued)

- If the target is not at the beginning of the document, the target spot must be marked
- Target labels can be defined in many different tags with the id attribute, as in
  - <h1 id = "baskets"> Baskets </h1>
- The link to an id must be preceded by a pound sign (#); If the id is in the same document, this target could be
  - What about baskets?
- If the target is in a different document, the document reference must be included
  - Baskets

Hypertext Links (continued)

- Style note: a link should blend in with the surrounding text, so reading it without taking the link should not be made less pleasant

- Links can have images:

```
<a href = "c210data.html“>
<img src = "smallplane.jpg"
 alt = "Small picture of an airplane " />
  Info on C210 </a>
```

- One common use of links to parts of the same document is to provide a table of contents in which each entry has a link
  - Usually implemented as a stylized list of links

Lists

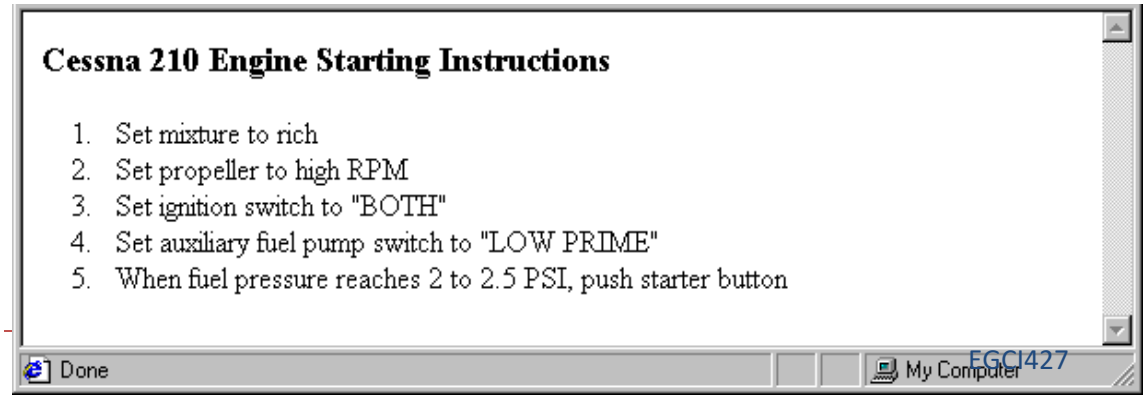
- Unordered lists
  - The list is the content of the <ul> tag
  - List elements are the content of the <li> tag

```
<h3> Some Common Single-Engine Aircraft </h3>
 <ul>
   <li> Cessna Skyhawk </li>
   <li> Beechcraft Bonanza </li>
   <li> Piper Cherokee </li>
 </ul>
```

Lists (continued)

- Ordered lists
  - The list is the content of the <ol> tag
  - Each item in the display is preceded by a sequence value

```
<h3> Cessna 210 Engine Starting Instructions</h3>
<ol>
  <li> Set mixture to rich </li>
  <li> Set propeller to high RPM </li>
  <li> Set ignition switch to "BOTH" </li>
  <li> Set auxiliary fuel pump switch to "LOW PRIME" </li>
  <li> When fuel pressure reaches 2 to 2.5 PSI, push starter button </li>
</ol>
```



Lists (continued)

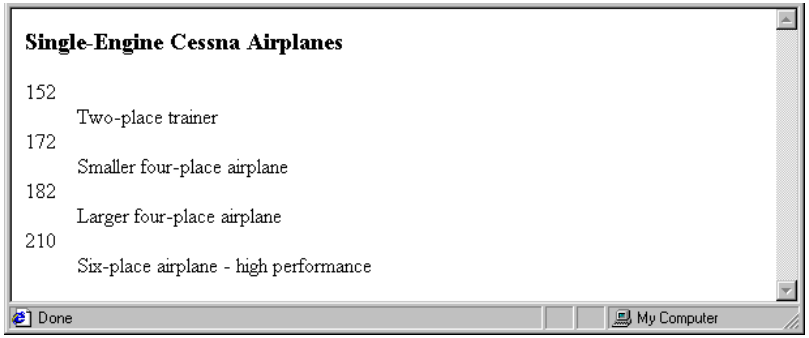
- Nested lists
  - Any type list can be nested inside any type list
  - The nested list must be in a list item

- Try nested_lists.html and look at the code!

Lists (continued)

- Definition lists (for glossaries, etc.)
  - List is the content of the <dl> tag
  - Terms being defined are the content of the <dt> tag
  - The definitions themselves are the content of the <dd> tag

```
<h3> Single-Engine Cessna Airplanes </h3>
<dl >
 <dt> 152 </dt>
 <dd> Two-place trainer </dd>
 <dt> 172 </dt>
 <dd> Smaller four-place airplane </dd>
 <dt> 182 </dt>
 <dd> Larger four-place airplane </dd>
 <dt> 210 </dt>
 <dd> Six-place airplane - high performance
 </dd>
</dl>
```

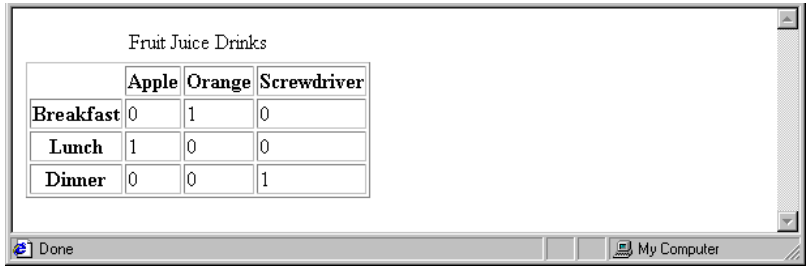


Tables

- A table is a matrix of cells, each possibly having content
- The cells can include almost any element
- Some cells have row or column labels and some have data
- A table is specified as the content of a <table> tag
- A border attribute in the <table> tag specifies a border between the cells
- If border is set to "border", the browser's default width border is used
- The border attribute can be set to a number, which will be the border width
- Without the border attribute, the table will have no lines!
- Tables are given titles with the <caption> tag, which can immediately follow <table>

Tables (cont.)

- Each row of a table is specified as the content of a <tr> tag
- The row headings are specified as the content of a <th> tag
- The contents of a data cell is specified as the content of a <td> tag



Fruit Juice Drinks

	Apple	Orange	Screwdriver
Breakfast	0	1	0
Lunch	1	0	0
Dinner	0	0	1

Done

My Computer

```
<table border = "border">
  <caption> Fruit Juice Drinks </caption>
   <tr>
    <th> </th>
    <th> Apple </th>
    <th> Orange </th>
    <th> Screwdriver </th>
   </tr>
   <tr>
    <th> Breakfast </th>
    <td> 0 </td>
    <td> 1 </td>
    <td> 0 </td>
   </tr>
   <tr>
    <th> Lunch </th>
    <td> 1 </td>
    <td> 0 </td>
    <td> 0 </td>
   </tr>
  </table>
```

Tables (cont.)

- A table can have two levels of column labels
  - If so, the colspan attribute must be set in the <th> tag to specify that the label must span some number of columns

```
<tr>
  <th colspan = "3"> Fruit Juice Drinks </th>
</tr>
<tr>
  <th> Orange </th>
  <th> Apple </th>
  <th> Screwdriver </th>
</tr>
```

Tables (cont.)

- If the rows have labels and there is a spanning column label, the upper left corner must be made larger, using rowspan

```
<table border = "border">
 <tr>
  <td rowspan = "2"> </td>
  <th colspan = "3"> Fruit Juice Drinks
  </th>
 </tr>
 <tr>
  <th> Apple </th>
  <th> Orange </th>
  <th> Screwdriver </th>
 </tr>
      …
</table>
```

Fruit Juice Drinks and Meals

	Fruit Juice Drinks		
	Apple	Orange	Screwdriver
Breakfast	0	1	0
Lunch	1	0	0
Dinner	0	0	1

Tables (cont.)

- The *align* attribute controls the horizontal placement of the contents in a table cell
  - Values are left, right, and center (default)
  - align is an attribute of <tr>, <th>, and <td> elements
- The *valign* attribute controls the vertical placement of the contents of a table cell
  - Values are top, bottom, and center (default)
  - valign is an attribute of <th> and <td> elements
  - cell_align.html and display it
- The cellspacing attribute of <table> is used to specify the distance between cells in a table
- The cellpadding attribute of <table> is used to specify the spacing between the content of a cell and the inner walls of the cell prevent it not to be too close to the edge

Tables (continued)

```
<table cellspacing = "50">
    <tr>
      <td> Colorado is a state of …
      </td>
      <td> South Dakota is somewhat…
      </td>
    </tr>
  </table>
```

Colorado is a state of contrasts. The eastern half is a mostly treeless prairie. On the prairie, trees grow only in the Platte and Arkansas river valleys, with a few found along some other small streams. The forested Rocky Mountains rise abruptly from the high plains about midway from east to west and cover most of the western half of the state. There are 54 mountains in Colorado that top 14,000 feet.	South Dakota is somewhat similar to Colorado in that it is a mostly treeless prairie in the east, but has a range of forested mountains in the west. But in South Dakota, the mountains, named the Black Hills, lie only in the far western part of the state and rise to only a little over 7500 feet. However, they are still the highest mountains east of the Rockies in the U.S. The famous Mount Rushmore is nestled in the middle of the Black Hills.

Tables (continued)

- Table Sections
  - Header, body, and footer, which are the elements: thead, tbody, and tfoot
  - If a document has multiple tbody elements, they are separated by thicker horizontal

Forms

- A form is the usual way information is received from a browser to a server
- HTML has tags to create a collection of objects that implement this information gathering
  - The objects are called widgets (e.g., radio buttons and checkboxes)
- When the Submit button of a form is clicked, the form's values are sent to the server

Forms (cont.)

- All of the widgets, or components of a form are defined in the content of a <form> tag
  - The only required attribute of <form> is action, which specifies the URL of the application that is to be called when the Submit button is clicked
  - action = "http://www.cs.ucp.edu/cgi-bin/survey.pl"
    - If the form has no action, the value of action is the empty string

Forms (cont.)

- The method attribute of <form> specifies one of the two possible techniques of transferring the form data to the server, *get* and *post*
  - get and post are discussed later

- Widgets
  - Many are created with the <input> tag
  - The type attribute of <input> specifies the kind of widget being created
    - Text, checkboxes, passwords, radio buttons, and the action buttons i.e. Reset, Submit, and plain

Forms (cont.)

- Text
  - Creates a horizontal box for text input
  - Default size is 20; it can be changed with the size attribute
  - If more characters are entered more than 20, the box is scrolled (shifted) left
  - If you don't want to allow the user to type more characters than 20, set maxlength, which causes excess input to be ignored

```
<input type = "text" name = "Phone“   size = "12" >
```

Forms (cont.)

- Checkboxes - to collect multiple choice input
  - Every checkbox requires a value attribute, which is the widget's value in the form data when the checkbox is 'checked'
    - A checkbox that is not 'checked' contributes no value to the form data
  - By default, no checkbox is initially 'checked'
  - To initialize a checkbox to 'checked', the checked attribute must be set to "checked"

Forms (continued)

```
Grocery Checklist
<form action = "">
  <p>
  <input type = "checkbox"  name ="groceries"
        value = "milk"  checked = "checked“/>
   Milk
  <input type = "checkbox"  name ="groceries"
        value = "bread“/>
   Bread
  <input type = "checkbox"  name = "groceries"
        value= "eggs“/>
   Eggs
  </p>
</form>
```

Grocery Checklist

☑ Milk ☐ Bread ☐ Eggs

Forms (cont.)

- Radio Buttons - collections of checkboxes in which only one button can be ‘checked’ at a time
  - Every button in a radio button group MUST have the same name
  - If no button in a radio button group is ‘pressed’, the browser often ‘presses’ the first one

Forms (cont.)

- Radio Buttons (continued)

```
Age Category
<form action = "">
  <p>
  <input type = "radio"  name = "age"
   value = "under20" checked = "checked"> 0-19
  <input type = "radio"  name = "age"
        value = "20-35"> 20-35
  <input type = "radio"  name = "age"
        value = "36-50"> 36-50
  <input type = "radio"  name = "age"
        value = "over50"> Over 50
  </p>
</form>
```

Age Category

0-19 20-35 36-50 Over 50

Forms (cont.)

- Menus - created with <select> tags
- There are two kinds of menus, those that behave like checkboxes and those that behave like radio buttons (the default)
  - Menus that behave like checkboxes are specified by including the multiple attribute, which must be set to "multiple“
- The name attribute of <select> is required
- The size attribute of <select> can be included to specify the number of menu items to be displayed (the default is 1)
  - If size is set to > 1 or if multiple is specified, the menu is displayed as a pop-up menu

Forms (cont.)

- Menus (continued)
  - Each item of a menu is specified with an <option> tag, whose pure text content (no tags) is the value of the item
  - An <option> tag can include the selected attribute, which when assigned "selected" specifies that the item is preselected

```
Grocery Menu - milk, bread, eggs, cheese
<form action = "">
 <p>
  With size = 1 (the default)
  <select name = "groceries">
   <option> milk </option>
   <option> bread </option>
   <option> eggs </option>
   <option> cheese </option>
  </select>
 </p>
</form>
```

Forms (continued)

Grocery Menu - milk, bread, eggs, cheese

With size = 1 (the default) milk

- After clicking the menu:

Grocery Menu - milk, bread, eggs, cheese

With size = 1 (the default) milk

milk
bread
eggs
cheese

- After changing size to 2:

Grocery Menu - milk, bread, eggs, cheese

With size = 2 (specified) milk
bread

Forms (cont.)

- Text areas - created with <textarea>
  - Usually include the rows and cols attributes to specify the size of the text area
  - Default text can be included as the content of <textarea>
  - Scrolling is implicit if the area is overfilled

```
Please provide your employment aspirations
<form action = "">
  <p>
  <textarea name = "aspirations"  rows = "3”
          cols = "40">
  (Be brief and concise)
  </textarea>
  </p>
</form>
```

Please provide your employment aspirations

(Be brief and concise)

Forms (cont.)

- Reset and Submit buttons
  - Both are created with <input>
- <input type = "reset" value = "Reset Form">
- <input type = "submit” value = "Submit Form">
- Submit has two actions:
  - Encode the data of the form
  - Request that the server executes the server-resident program specified as the value of the action attribute of <form>
  - A Submit button is required in every form
- try: popcorn.html and display it

Frames

- Frames are rectangular sections of the display window, each of which can display a different document
- Because frames are no longer part of XHTML, you cannot validate a document that includes frames
- The <frameset> tag specifies the number of frames and their layout in the window
  - <frameset> takes the place of <body>
  - Cannot have both!
  - <frameset> must have either a rows attribute or a cols attribute, or both (usually the case)
  - Default is 1

Frames (cont.)

- The possible values for rows and cols are numbers, percentages, and asterisks
  - A number value specifies the row height in pixels - Not terribly useful!
  - A percentage specifies the percentage of total window height for the row - Very useful!
  - An asterisk after some other specification gives the remainder of the height of the window

- Examples:
  - <frameset rows = "150, 200, 300">
  - <frameset rows = "25%, 50%, 25%">
  - <frameset rows = "50%, 20%, *" >
  - <frameset rows = "50%, 25%, 25%” cols = "40%, *">

Frames (cont.)

- The <frame> tag specifies the content of a frame
- The first <frame> tag in a <frameset> specifies the content of the first frame, etc.
  - The sequence of <frame> tags in a frameset is important
  - The frames in the frameset appear by rows
  - Frame content is specified with the src attribute
  - Without a src attribute, the frame will be empty (such a frame CANNOT be filled later)
- If <frameset> has fewer <frame> tags than frames, the extra frames are empty

Frames (cont.)

- Scrollbars are implicitly included if needed (they are needed if the specified document will not fit)
- If a name attribute is included, the content of the frame can be changed later (by selection of a link in some other frame)
- try: frames.html
- Note: the Frameset standard must be specified in the DOCTYPE declaration

Frames (cont.)

```
<!-- contents.html
     The contents of the first frame of
     frames.html, which is the table of
     contents for the second frame
     -->
<html xmlns = "http://www.w3.org/1999/xhtml">
  <head> <title> Table of Contents Frame
         </title>
  </head>
  <body>
    <h4> Fruits </h4>
    <ul>
      <li> <a href = "apples.html"
              target = "descriptions">
              apples </a>
      <li> <a href = "bananas.html"
              target = "descriptions">
              bananas </a>
      <li> <a href = "oranges.html"
              target = "descriptions">
              oranges </a>
    </ul>
  </body>
</html>
```

Frames (cont.)

- Nested frames - to divide the screen in more interesting ways
- try: nested_frames.html

Syntactic Differences between HTML & XHTML

- Case sensitivity
  - HTML tags are case insensitive
- Closing tags
  - In HTML some closing tags may be omitted if a browser can infer their presence
- Quoted attribute values
  - In HTML, attribute values must be quoted only if there are embedded special characters or whitespace
  - In XHTML, all attribute values must be quoted
- Explicit attribute values
  - i.e. border attribute have to be specified in XHTML but in HTML without a value it specifies a default
- id and name attributes
  - id is encouraged in XHTML
- Element nesting
  - Rules against improper nesting are not enforced in HTML