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Session 1 - HyperText Markup Language (HTML)

Designing Documents for the World Wide Web

Agenda

- **Introduction to HTML**
- **Creating and publishing a Web page**
- **Validating a document**
- **Main HMTL elements**
- **Block-level HTML elements**
- **Text-level HTML element**
- **Creating hypertext links**
- **Adding images to documents**
- **Building tables**

The World Wide Web

- **Definitions**
  - The World Wide Web
    - The set of computers on the Internet that support HTTP
    - Not a separate network.
  - HTTP
    - The HyperText Transfer Protocol.
    - The language used by a WWW client (e.g. Netscape, Internet Explorer) to request documents from a WWW server (i.e. the program running at Web sites like amazon.com or yahoo.com)
  - HTML
    - The HyperText Markup Language
    - The language used to design web pages

HyperText Markup Language

- **Text Mixed with Markup Tags**
  - Tags Enclosed in Angle Brackets (<H1>Introduction</H1>)
- **What Does Markup Describe?**
  - Appearance
  - Layout
  - Content (Can't Enforce an Exact Look)

HTML Example

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
<TITLE>Home Page for Marty Hall</TITLE>
…
<BODY BGCOLOR="#FDF5E6" TEXT="#000000" LIN
      VLINK="#551A8B" ALINK="#FF0000">
<CENTER>
<TABLE BORDER=3 BGCOLOR="#3366FF">
  <TR><TD><STRONG CLASS="title">Home Page
</TABLE>
<P>
<TABLE>
  <TR><TD><STRONG><B>Marty Hall</B><BR>
      President<BR>
      <A HREF="http://www.coreservlets.com
      coreservlets.com, Inc.</A><BR>
      6 Meadowsweet Ct., Suite B1<BR>
      Reisterstown, MD 21136-6020<BR>
      <I>email:</I>
        <A HREF="mailto:hall@coreservlets.com">hall@coreservlets.com</A><BR>
      <I>Phone:</I> (410) 429-5535<BR>
      <I>Fax:</I> (410) 429-4931</STRONG></TD>
    <TD><IMG SRC="images/Marty-JHU-Head-Small.jpg"
          ALT="Marty" WIDTH="225" HEIGHT="263" HSPACE="5"></TD></TR>
</TABLE>…
```

Creating and Publishing a Web Page

1. **Create an HTML document**
2. **Place the document in a world-accessible directory on a system running an HTTP server**
3. **Access the web page through http://*hostname*/~*username*/*filename***

   - E.g. `http://www.apl.jhu.edu/~hall/test.html`
   – If the filename is omitted, a system default filename is assumed (often `index.html`)
     - E.g. `http://www.apl.jhu.edu/~hall/` refers to the file `index.html` in hall's `public_html` directory

Creating and Publishing a Web Page, cont.

4. Validate the Document

- Check the syntax using a formal HTML validator
  - http://www.htmlhelp.com/tools/validator/
  - http://validator.w3.org/

- The version of HTML against which the document is validated is based on the DOCTYPE

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

- The WWW Consortium recently added advice that Web pages include information on the character set, even though ASCII or Latin-1 is the default. The validator at http://validator.w3.org/ gives warnings if you omit this. You can ignore such warnings if you wish.

HTML Document Template

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
  <TITLE>Title</TITLE>                    ←── Goes on browser's title bar
</HEAD>                                         May not appear in printouts


<BODY>
<H1>Main Heading</H1>                      ←── Main heading. Often used as title
                                                Appears in printouts

                                                HTML comment
<!-- Rest of page goes here -->            ←── Replace with body of
                                                WWW page

</BODY>
</HTML>
```

Title - Netscape

File   Edit   View   Go   Communicator   Help

Main Heading

Document: Done

Main HTML Elements

1. **DOCTYPE**
2. **HTML**
3. **HEAD**
   - TITLE element required
   - Optional elements:
     - BASE
     - META
     - BGSOUND
     - SCRIPT, NOSCRIPT
     - STYLE
     - LINK

HTML

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Main HTML Elements (Continued)

4. BODY Element

- <BODY BGCOLOR="YELLOW">
- HTML Attributes and Attribute Values
  - BACKGROUND
  - BGCOLOR
  - TEXT
  - LINK, VLINK, ALINK
  - OnLoad, OnUnload, OnFocus, OnBlur,…

5. Elements inside BODY element

- <BODY>
  Remaining HTML elements
  </BODY>

META Element

- **Records document information, forwards and refreshes pages**
  - NAME="author"
  - NAME="keywords"
  - NAME="description"
  - HTTP-EQUIV="refresh"

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META Element, Example

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
   <TITLE>News Headlines</TITLE>
   <META HTTP-EQUIV="REFRESH"
        CONTENT="3600">
</HEAD>

<BODY>
<H1 ALIGN="CENTER">News Headlines</H1>

<H2>National News</H2>
Blah, blah, blah.

<H2>International News</H2>
Yadda, yadda, yadda.

</BODY>
</HTML>
```

Block-Level Elements

- **Headings**
  - H1 ... H6
  - ALIGN

- **Basic Text Sections**
  - P
  - ALIGN
  - PRE
  - WIDTH
  - ADDRESS
  - BLOCKQUOTE

Block-Level Elements, cont.

- **Lists**
  - OL
  - LI
  - UL
  - LI (the same with)
  - DL
  - DT
  - DD
- **Tables and Forms (Postponed)**
- **Misc.**
  - HR
  - DIV
  - CENTER
  - MULTICOL (Netscape only)

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Headings

- **Heading Types**
  - <H1 ...> ... </H1>
  - <H2 ...> ... </H2>
  - <H3 ...> ... </H3>
  - <H4 ...> ... </H4>
  - <H5 ...> ... </H5>
  - <H6 ...> ... </H6>
- **Attributes: ALIGN**
  - Values: LEFT (default), RIGHT, CENTER
- **Nesting tags**
  - Headings and other block-level elements can contain text-level elements, but *not* vice versa

Headings, Example

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
  <TITLE>Document Headings</TITLE>
</HEAD>
<BODY>
Samples of the six heading types:
<H1>Level-1 (H1)</H1>
<H2 ALIGN="CENTER">Level-2 (H2)</H2>
<H3><U>Level-3 (H3)</U></H3>
<H4 ALIGN="RIGHT">Level-4 (H4)</H4>
<H5>Level-5 (H5)</H5>
<H6>Level-6 (H6)</H6>
</BODY>
</HTML>
```

Headings, Result
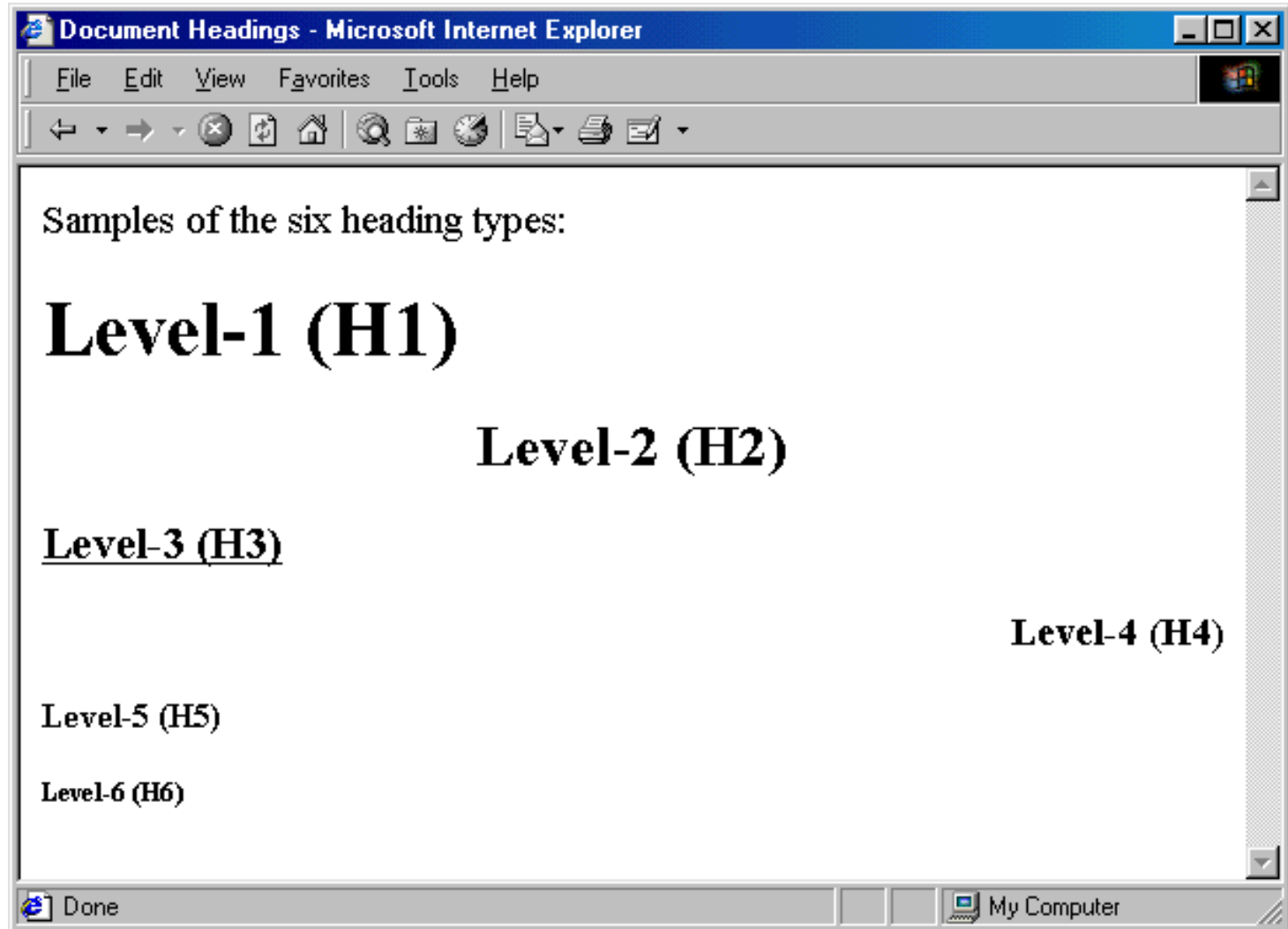
P – The Basic Paragraph

- ## **Attributes: ALIGN**
  - LEFT (default), RIGHT, CENTER. Same as headings.
  - Whitespace ignored (use <BR> for line break)
    - Consecutive <P>'s do not yield multiple blank lines
  - End Tag is Optional:

```
<BODY>
<P>
Paragraph 1
</P>
<P>
Paragraph 2
</P>
<P>
Paragraph 3
</P>
</BODY>
```
Fully-Specified

```
<BODY>
Paragraph 1
<P>
Paragraph 2
<P>
Paragraph 3
</BODY>
```
Equivalent with Implied Tags

Preformatted Paragraphs

- ## The PRE Element
  - \<PRE\> ... \</PRE\>

- ## Attributes: WIDTH
  - Expected width in characters. Not widely supported.

- ## Problem: Special Characters

```
<PRE>
if (a<b) {
  doThis();
} else {
  doThat();
}
</PRE>
```

Desired Character	HTML Required
<	<
>	>
&	&amp
"	"
Non-breaking space	

OL: Ordered (Numbered) Lists

- **OL Element**
  - \<OL\>
      \<LI\>…
      \<LI\>…

      …

      \</ÖL\>
  - Attributes: TYPE, START, COMPACT

- **List entries: LI**
  - \<LI ...\> ... \</LI\> (End Tag Optional)
  - Attributes: (When inside OL) VALUE, TYPE

```
A sample list:
<OL>
   <LI>List Item One
   <LI>List Item Two
   <LI>List Item Three
</OL>
```

A sample list:

   1. List Item One
   2. List Item Two
   3. List Item Three

HTML

Nested Ordered Lists

```
<OL TYPE="I">
<LI>Headings
  <LI>Basic Text Sections
  <LI>Lists
      <OL TYPE="A">
        <LI>Ordered
            <OL TYPE="1">
              <LI>The OL tag
                  <OL TYPE="a">
                    <LI>TYPE
                    <LI>START
                    <LI>COMPACT
                  </OL>
              <LI>The LI tag
            </OL>
        <LI>Unordered
            <OL TYPE="1">
              <LI>The UL tag
              <LI>The LI tag
            </OL>
        <LI>Definition
            <OL TYPE="1">
              <LI>The DL tag
              <LI>The DT tag
              <LI>The DD tag
            </OL>
      </OL>
  <LI>Miscellaneous
</OL>
```

```
 I.  Headings
 II.  Basic Text Sections
III.  Lists
        A.  Ordered
               1.  The OL tag
                      a.  TYPE
                      b.  START
                      c.  COMPACT
               2.  The LI tag
        B.  Unordered
               1.  The UL tag
               2.  The LI tag
        C.  Definition
               1.  The DL tag
               2.  The DT tag
               3.  The DD tag
 IV.  Miscellaneous
```

HTML

UL: Unordered (Bulleted) Lists

- **UL Element**
  - \<UL\>
    \<LI\>…
    \<LI\>…

    ...

    \</UL\>

- **Attributes: TYPE, COMPACT**
  - TYPE is DISC, CIRCLE, or SQUARE

- **List entries: LI (TYPE)**
  - TYPE is DISC, CIRCLE, or SQUARE

    ```
    A sample list:
    <UL>
      <LI>List Item One
      <LI>List Item Two
      <LI>List Item Three
    </UL>
    ```

A sample list:

- List Item One
- List Item Two
- List Item Three

UL: Custom Bullets

```
<UL TYPE="DISC">
   <LI>The UL tag
       <UL TYPE="CIRCLE">
         <LI>TYPE
           <UL TYPE="SQUARE">
             <LI>DISC
             <LI>CIRCLE
             <LI>SQUARE
           </UL>
         <LI>COMPACT
       </UL>
   <LI>The LI tag
       <UL TYPE="CIRCLE">
         <LI>TYPE
           <UL TYPE="SQUARE">
             <LI>DISC
             <LI>CIRCLE
             <LI>SQUARE
           </UL>
         <LI>VALUE
       </UL>
</UL>
```

Unordered Lists

- The UL tag
  - TYPE
    - DISC
    - CIRCLE
    - SQUARE
  - COMPACT
- The LI tag
  - TYPE
    - DISC
    - CIRCLE
    - SQUARE
  - VALUE

Text-Level Elements

- **Physical Character Styles**
  - B, I, TT, U, SUB, SUP, SMALL, BIG, STRIKE, Q, BLINK
  - FONT
    - SIZE
    - COLOR
    - FACE
  - BASEFONT
  - SIZE
- **Logical Character Styles**
  - EM, STRONG, CODE, SAMP, KBD, DFN, VAR, CITE

Text-Level Elements (Continued)

- **Hypertext Links**
  - A
    - HREF, NAME, TARGET, ...
- **Images**
  - IMG
    - SRC (required), ALT, ALIGN, WIDTH, HEIGHT, HSPACE, VSPACE, BORDER, USEMAP, ISMAP
- **Misc. Text-Level Elements**
  - BR (Explicit line break)
  - AREA (Client-side image maps)
  - APPLET (Java),
  - ...

Physical Character Styles, Example

```
...
<H1>Physical Character Styles</H1>
<B>Bold</B><BR>
<I>Italic</I><BR>
<TT>Teletype (Monospaced)</TT><BR>
<U>Underlined</U><BR>
Subscripts: f<SUB>0</SUB> + f<SUB>1</SUB><BR>
Superscripts: x<SUP>2</SUP> + y<SUP>2</SUP><BR>
<SMALL>Smaller</SMALL><BR>
<BIG>Bigger</BIG><BR>
<STRIKE>Strike Through</STRIKE><BR>
<B><I>Bold Italic</I></B><BR>
<BIG><TT>Big Monospaced</TT></BIG><BR>
<SMALL><I>Small Italic</I></SMALL><BR>
<FONT COLOR="GRAY">Gray</FONT><BR>
<DEL>Delete</DEL><BR>
<INS>Insert</INS><BR>
...
```
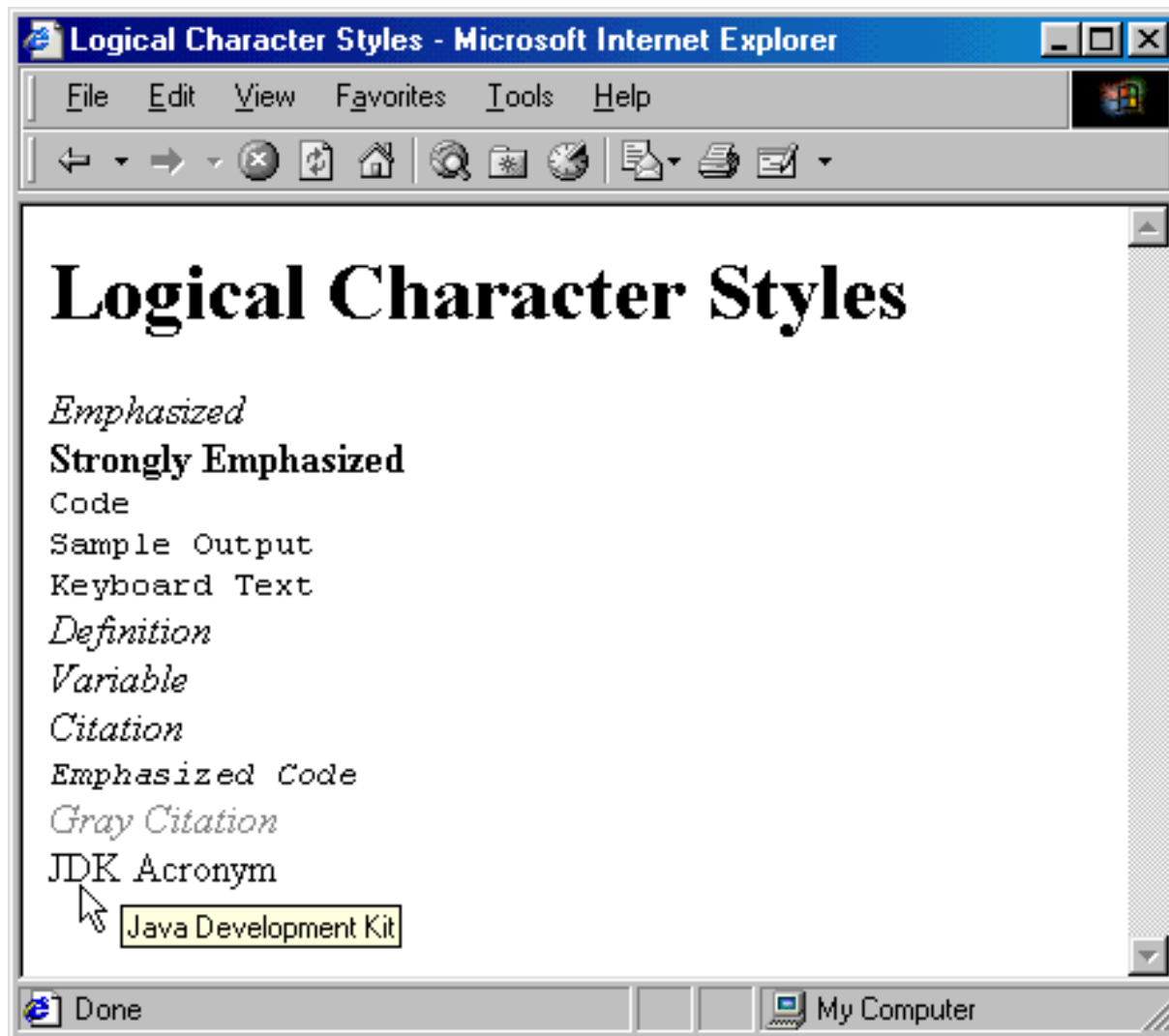
Physical Character Styles, Result
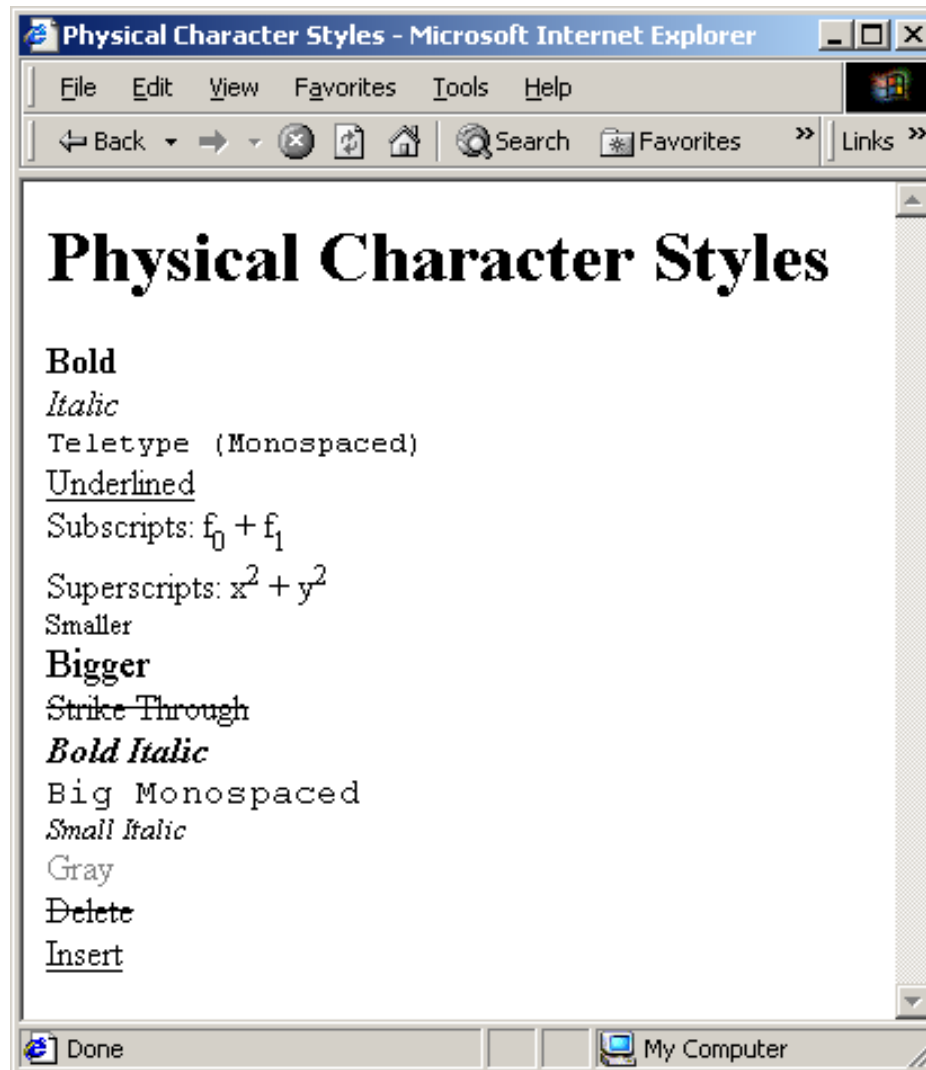
Logical Character Styles, Example

```
...
<H1>Logical Character Styles</H1>
<EM>Emphasized</EM><BR>
<STRONG>Strongly Emphasized</STRONG><BR>
<CODE>Code</CODE><BR>
<SAMP>Sample Output</SAMP><BR>
<KBD>Keyboard Text</KBD><BR>
<DFN>Definition</DFN><BR>
<VAR>Variable</VAR><BR>
<CITE>Citation</CITE><BR>
<EM><CODE>Emphasized Code</CODE></EM><BR>
<FONT COLOR="GRAY"><CITE>Gray Citation</CITE></FONT><BR>
<ACRONYM TITLE="Java Development Kit">JDK Acronym</ACRONYM>
...
```

Logical Character Styles, Result

HTML

Hypertext Links

- **Links can contain images and other text-level elements (i.e., <A HREF…> ... </A>)**
- **Link to Absolute URL**
  - Use a complete URL beginning with http://

    ```
    Java is discussed in
    <A HREF="http://host/path/chapter2.html">
    Chapter 2</A>.
    ```

- **Link to Relative URL**
  - Use a filename or relative path to filename
    - Interpreted write location of current file

    ```
    Java is discussed in
    <A HREF="chapter2.html">Chapter 2</A>.
    ```

Hypertext Links (Continued)

- ## **Link to Section**
  - – Use a section name (see below) preceded by #

    ```
    Images are discussed in
    <A HREF="#Section2">Section 2</A>.
    ```

- ## **Link to Section in URL**
  - – Use absolute or relative URL, then #, then section name

    ```
    Images are discussed in
    <A HREF="chapter1.html#Section2">
    Sec. 2 of Chap. 1</A>.
    ```

- ## **Naming a Section**
  - – Use <A NAME="..."> and do not include the pound sign

    ```
    <H2><A NAME="Section2">Images</A></H2>
    ```

IMG: Embedding Images

- ## Example

  ```
  <IMG SRC="SomeFile.gif" ALT="My Dog"
       WIDTH=400 HEIGHT=300>
  ```

- ## Attributes:

  - SRC (required)
  - ALT (technically required)
  - ALIGN (see <BR CLEAR="ALL">)
  - WIDTH, HEIGHT
  - HSPACE, VSPACE
  - BORDER
  - USEMAP, ISMAP

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Image Alignment, Example

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD><TITLE>Image Alignment</TITLE></HEAD>
<BODY>
<H1 ALIGN="CENTER">Image Alignment</H1>
<TABLE BORDER=1>
  <TR><TH>Alignment
      <TH>Result
  <TR><TH><CODE>LEFT</CODE>
      <TD><IMG SRC="rude-pc.gif" ALIGN="LEFT"
             ALT="Rude PC" WIDTH=54 HEIGHT=77>
          This positions the image at the left side,
          with text flowing around it on the right.
  <TR><TH><CODE>RIGHT</CODE>
      <TD><IMG SRC="rude-pc.gif" ALIGN="RIGHT"
             ALT="Rude PC" WIDTH=54 HEIGHT=77>
          This positions the image at the right side,
          with text flowing around it on the left.
  ...
</TABLE>
</BODY>
</HTML>
```

Image Alignment, Result
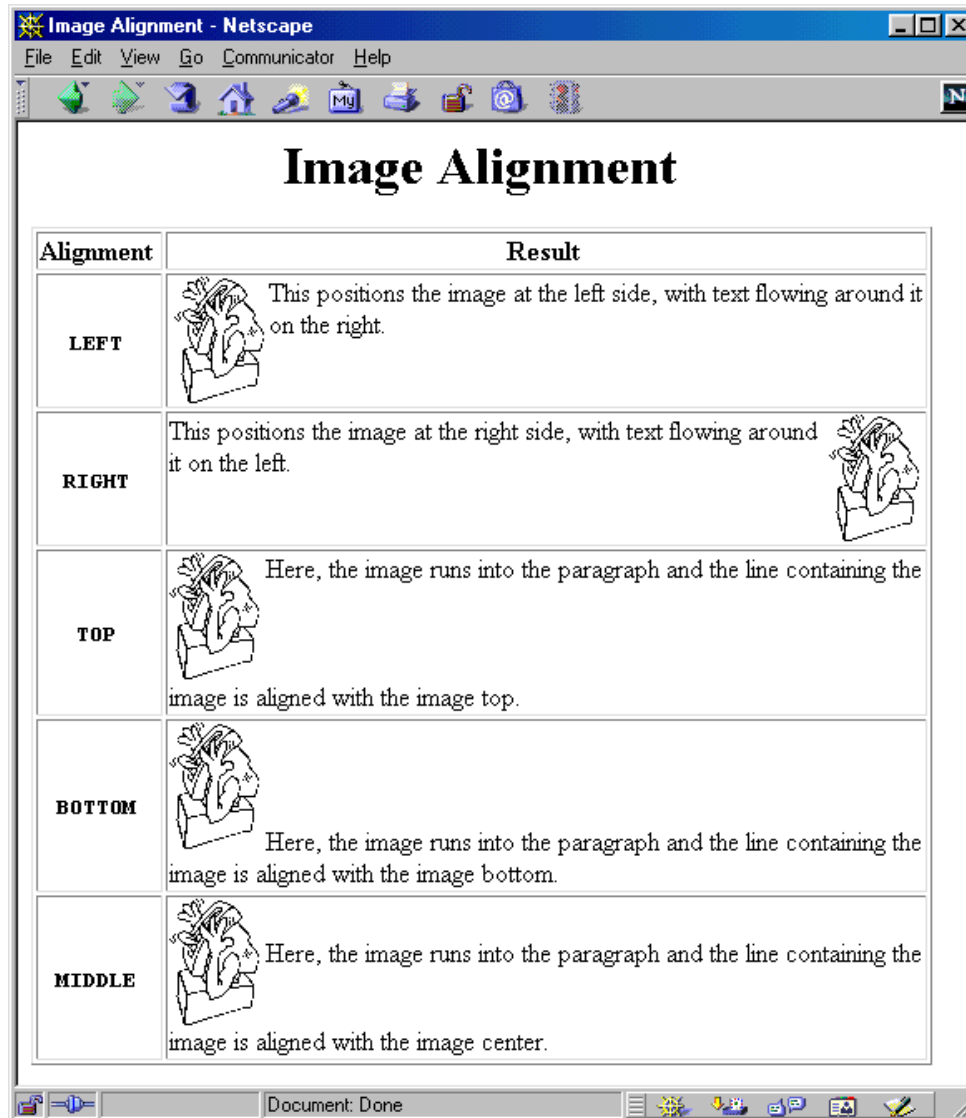
Tables

- ## Template

```
<TABLE BORDER=1>
    <CAPTION>Table Caption</CAPTION>
    <TR><TH>Heading1</TH>        <TH>Heading2</TH></TR>
    <TR><TD>Row1 Col1 Data</TD><TD>Row1 Col2 Data</TD></TR>
    <TR><TD>Row2 Col1 Data</TD><TD>Row2 Col2 Data</TD></TR>
    <TR><TD>Row3 Col1 Data</TD><TD>Row3 Col2 Data</TD></TR>
</TABLE>
```

Table Caption	
Heading1	Heading2
Row1 Col1 Data	Row1 Col2 Data
Row2 Col1 Data	Row2 Col2 Data
Row3 Col1 Data	Row3 Col2 Data

TABLE Element Attributes

- **ALIGN**
  - The ALIGN attribute gives the horizontal alignment of the table as a whole
  - Legal values are LEFT, RIGHT, and CENTER, with LEFT being the default
- **BORDER**
  - This specifies the width in pixels of the border around the table
  - This is in addition to the border around each cell (the CELLSPACING).
  - The default is zero, which also results in the visible 3D divider between cells being turned off
- **CELLSPACING**
  - This gives the space in pixels between adjacent cells. Drawn as a 3D line if BORDER is nonzero, otherwise empty space in the background color is used
  - The default is usually about 3

TABLE Element Attributes (Continued)

- **CELLPADDING**
  - CELLPADDING determines the empty space, in pixels, between the cell's border and the table element
  - The default is usually about 1
- **WIDTH**
  - This specifies the width of the table, either in pixels (<TABLE WIDTH=250>) or as a percentage of the current browser window width (<TABLE WIDTH="75%">)
- **BGCOLOR**
  - Specify the background color of the table TABLE (also legal for TR, TD, and TH)
- **BORDERCOLOR, BORDERCOLORDARK,**
- **BORDERCOLORLIGHT**
  - Non standard attributes supported by IE to specify the colors to user for the borders

TABLE Element Attributes (Continued)

- **BACKGROUND**
  - This nonstandard attribute supported by IE gives an image file that will be tiled as the background of the table
  - You might want to use style sheets instead.
- **RULES**
  - HTML 4.0 attribute that specifies which inner dividing lines are drawn
  - All are drawn if this attribute is omitted
  - Legal values are NONE, ROWS, COLS, and ALL
- **FRAME**
  - Specifies which outer borders are drawn
  - All four are drawn if this attribute is omitted
  - Legal values are BORDER or BOX (all), VOID (none), ABOVE (top), BELOW (bottom), HSIDES (top and bottom, despite the somewhat confusing name), VSIDES (left and right), LHS (left), and RHS (right)

Table **CAPTION**

- **Attribute**
  - ALIGN (Values: TOP, BOTTOM)
- **Usage**
  - An enclosing borderless table may give more flexibility than the built-in CAPTION.

Table Caption

Heading1	Heading2
Row1 Col1 Data	Row1 Col2 Data
Row2 Col1 Data	Row2 Col2 Data
Row3 Col1 Data	Row3 Col2 Data

TR: Table Row

- **TR is used to define each row in the table**
- **Each row will then contain TH and/or TD entries**
- **ALIGN**
  - ALIGN (legal values LEFT, RIGHT, or CENTER) is used to set the default horizontal alignment for table cells
- **VALIGN**
  - VALIGN (legal values TOP, MIDDLE, or BOTTOM) is used to set the default vertical alignment for table cells
- **BGCOLOR**
  - Sets the color for the table row, overriding any values set for the table as a whole via the BGCOLOR attribute of TABLE
- **BORDERCOLOR, BORDERCOLORDARK,**
- **BORDERCOLORLIGHT**
  - Supported only by Internet Explorer, these specify the colors to use for the row borders

Table Cells: TH and TD

- ## **COLSPAN**
  - COLSPAN defines a heading or cell data entry that spans multiple columns

```
<TABLE BORDER=1>
<TR><TH COLSPAN=2>Col 1&2 Heading
    <TH>Col3 Heading
  <TR><TD>Col1 Data
      <TD>Col2 Data
      <TD>Col3 Data
</TABLE>
```

Col 1&2 Heading		Col3 Heading
Col1 Data	Col2 Data	Col3 Data

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Table Cells: TH and TD (Continued)

- **ROWSPAN**
  - ROWSPAN defines a heading or cell data entry that spans multiple rows; similar to COLSPAN
- **ALIGN**
  - LEFT, RIGHT, CENTER, JUSTIFY and CHAR.
  - E.g., the following aligns entries on a decimal point

    ```
    <TD ALIGN="CHAR" CHAR=".">
    ```

- **VALIGN**
  - TOP, BOTTOM, MIDDLE
- **WIDTH, HEIGHT**
  - Values in pixels only (no percentages officially allowed)
- **NOWRAP**
  - Use with caution
- **BGCOLOR, BACKGROUND**
  - Same as for TABLE and TR

Summary

- **A DOCTYPE is required to validate the document**
- **HTML document should have an enclosing HTML element, a HEAD (TITLE is required) and a BODY**
- **Documents are composed of block-level and text-level elements**
  - Text-level elements must be inside block-level elements, not vice versa
- **Hypertext links, <A HREF="…">, can be absolute or relative**
  - A link to a named section is denoted by #*section*
- **Tables are composed of main table element, <TABLE>; rows, <TR>; table headers, <TH>; and table data, <TD>**
  - Use BGCOLOR to give background colors to tables, rows, or cells
  - Use ROWSPAN or COLSPAN to join cells

Thank for your listening

Question?

HTML Frames Layouts

Agenda

- **Advantages and disadvantages of frames**
- **FRAME template**
- **Defining rows and cols in a FRAMESET**
- **Common FRAME and FRAMESET attributes**
- **Nested frames**
- **Targeting a document to a named FRAME cell**
- **Dynamic inline frame tag: IFRAME**
- **Another common layout tag: DIV**

Frame Advantages

- **Certain parts of the interface (e.g., a TOC) are always on the screen**

- **Can avoid retyping common sections of multiple Web pages**

- **Consistent use across a large site sometimes simplifies user navigation**

- **A convenient way to mix text-oriented HTML with Java applets**

- **Image maps are more convenient if the map image remains on screen and only the results section changes**

Frame Disadvantages

- **The meaning of the "Back" and "Forward" buttons can be confusing (for old version)**
- **Poorly designed frames can get the user lost**
- **Hard to find real URL of a page you want**
  - Printing problems!
- **Hard to bookmark "configuration"**
- **Some very old browsers do not support frames**
- **Security**
  - Hackers can insert frame cells into your pages in some circumstances, perhaps stealing information intended for your site

Frame Template

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

<FRAMESET ...>
   <!-- FRAME and Nested FRAMESET Entries -->
   <NOFRAMES>
     <BODY>
       <!-- Stuff for non-Frames browsers -->
     </BODY>
   </NOFRAMES>
</FRAMESET>
</HTML>
```

FRAMESET Attributes

- ## COLS, ROWS
  - A comma-separated list of pixel values, percentages, and weighted remainders
  - FRAMESET entries should *always* specify at least two rows or columns. Netscape problems if not!
  - Examples

```
<FRAMESET ROWS="50,10%,*,2*">

   ...

</FRAMESET>
```

```
<FRAMESET COLS="25%,*,*">

   ...

</FRAMESET>
```

FRAMESET ROWS, Example


```
<FRAMESET ROWS="50,10%,*,2*">
   ...
</FRAMESET>
```

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FRAMESET Attributes (Continued)

- **FRAMEBORDER**
  - Indicates whether borders will be drawn *between* frame cells
  - YES or 1 specifies borders; NO or 0 specifies no border
  - Can be overridden by FRAMEBORDER settings in individual FRAME entries
  - Often used in conjunction with BORDER=0 and FRAMESPACING=0

- **BORDER (Netscape), FRAMESPACING (IE)**
  - Specify the thickness of the border between cells
  - Apply to outermost FRAMESET only

- **BORDERCOLOR**
  - Sets the color of the border between cell, using either a hex RGB value or color name

Frame Border, Examples

FRAME: Specifying Content of Frame Cells

- **SRC**
  - URL of the document to place in the frame cell
- **NAME**
  - Supplies destination for TARGET attribute of hypertext links
- **FRAMEBORDER, BORDERCOLOR**
- **MARGINWIDTH, MARGINHEIGHT**
  - Specifies the left/right and top/bottom cell margins, respectively
- **SCROLLING**
  - Indicates whether cells should have scrollbars
- **NORESIZE**
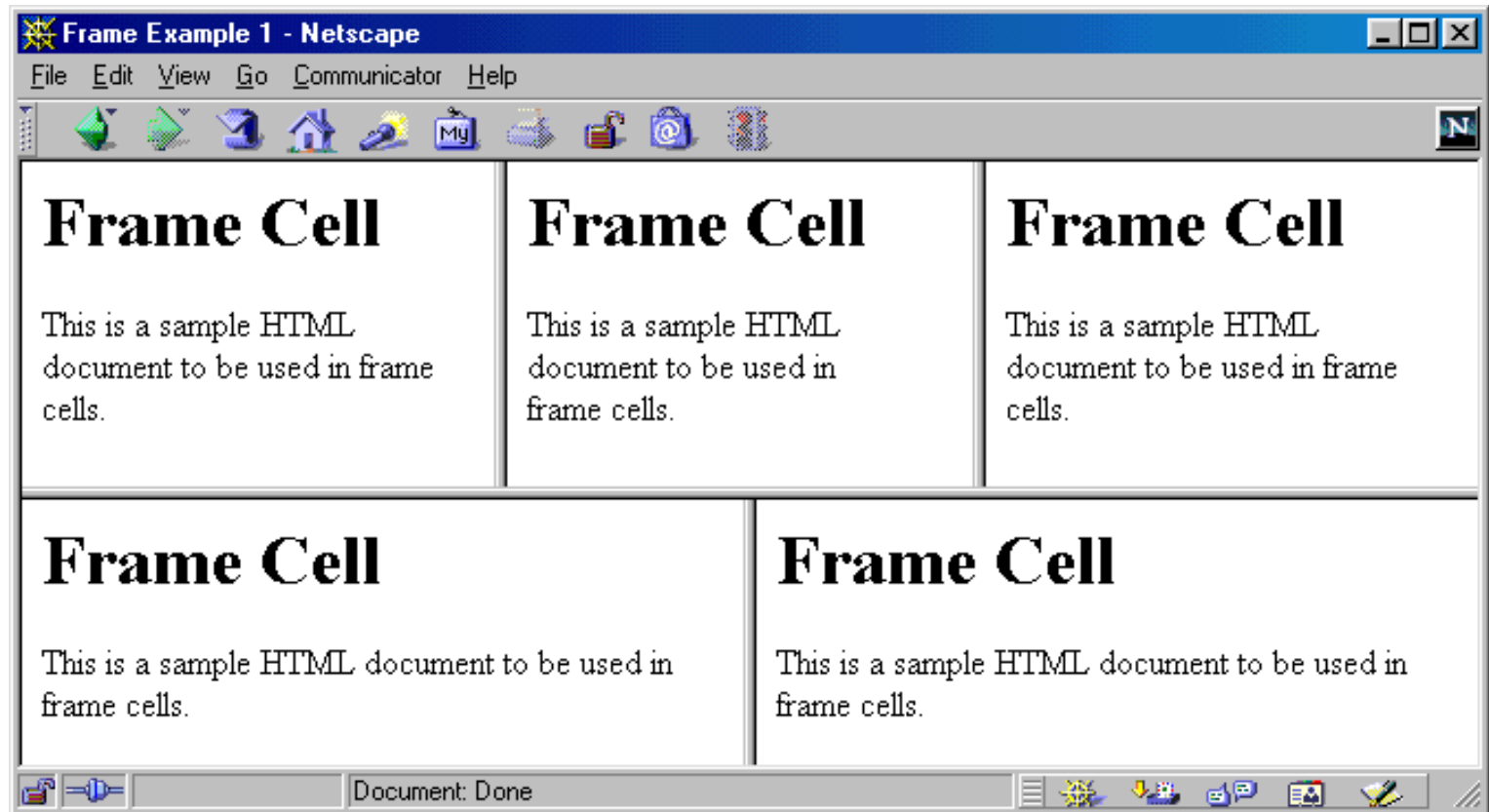 - Disables the ability to resize the frame cells

Frame Example 1

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Frameset//EN">
<HTML>
<HEAD><TITLE>Frame Example 1</TITLE></HEAD>
<FRAMESET ROWS="55%,45%">
  <FRAMESET COLS="*,*,*">
    <FRAME SRC="Frame-Cell.html">
    <FRAME SRC="Frame-Cell.html">
    <FRAME SRC="Frame-Cell.html">
  </FRAMESET>

  <FRAMESET COLS="*,*">
    <FRAME SRC="Frame-Cell.html">
    <FRAME SRC="Frame-Cell.html">
  </FRAMESET>

  <NOFRAMES>
    <BODY>
      Your browser does not support frames. Please see
      <A HREF="Frame-Cell.html">non-frames version</A>.
    </BODY>
  </NOFRAMES>
</FRAMESET>
</HTML>
```
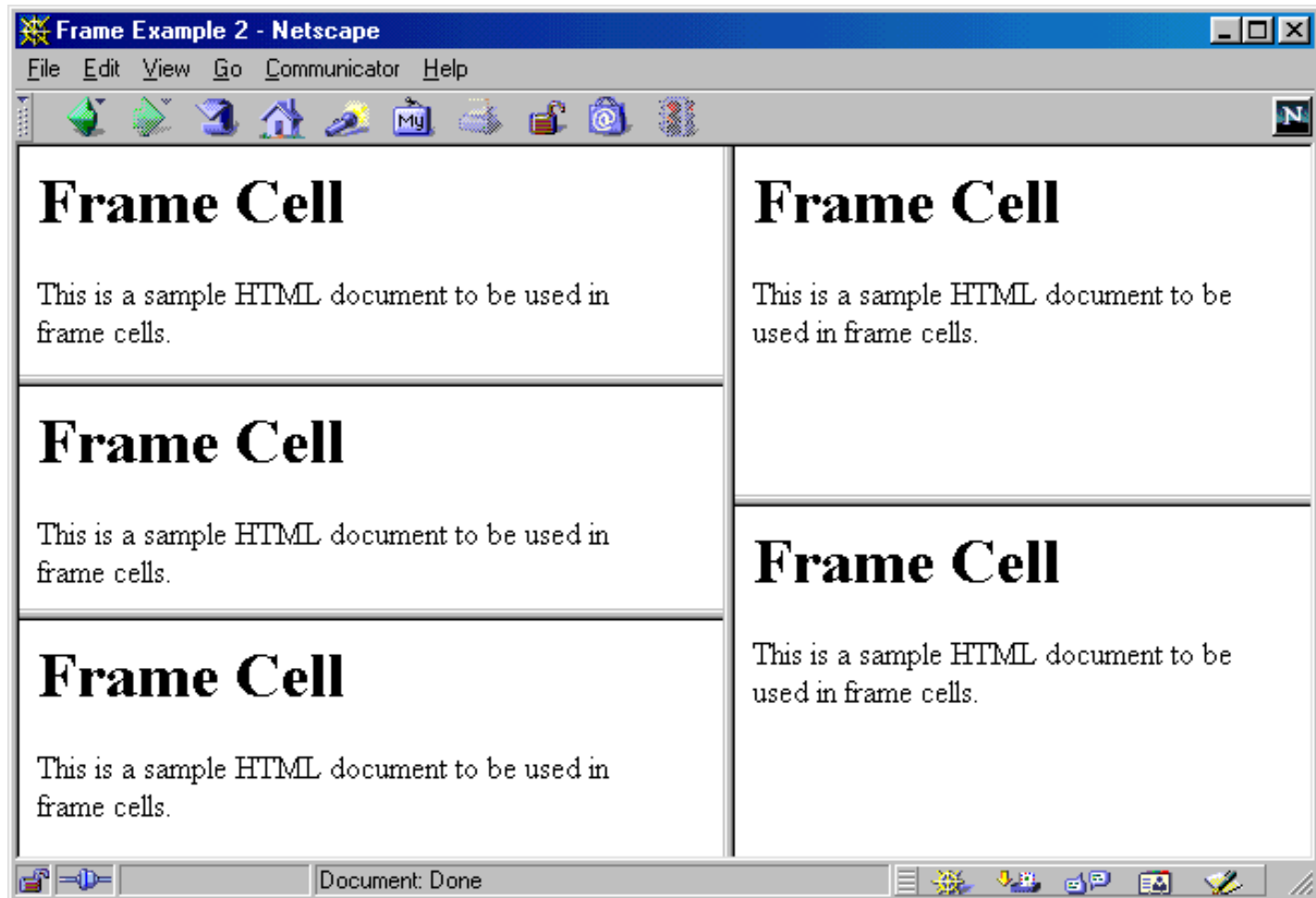
Frame Example 1, Result

Frame Example 2

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Frameset//EN">
<HTML>
<HEAD><TITLE>Frame Example 2</TITLE></HEAD>

<FRAMESET COLS="55%,45%">
  <FRAMESET ROWS="*,*,*">
    <FRAME SRC="Frame-Cell.html">
    <FRAME SRC="Frame-Cell.html">
    <FRAME SRC="Frame-Cell.html">
  </FRAMESET>

  <FRAMESET ROWS="*,*">
    <FRAME SRC="Frame-Cell.html">
    <FRAME SRC="Frame-Cell.html">
  </FRAMESET>
  <NOFRAMES>
    <BODY>
      Your browser does not support frames. Please see
      <A HREF="Frame-Cell.html">nonframes version</A>.
    </BODY>
  </NOFRAMES>
</FRAMESET>
</HTML>
```
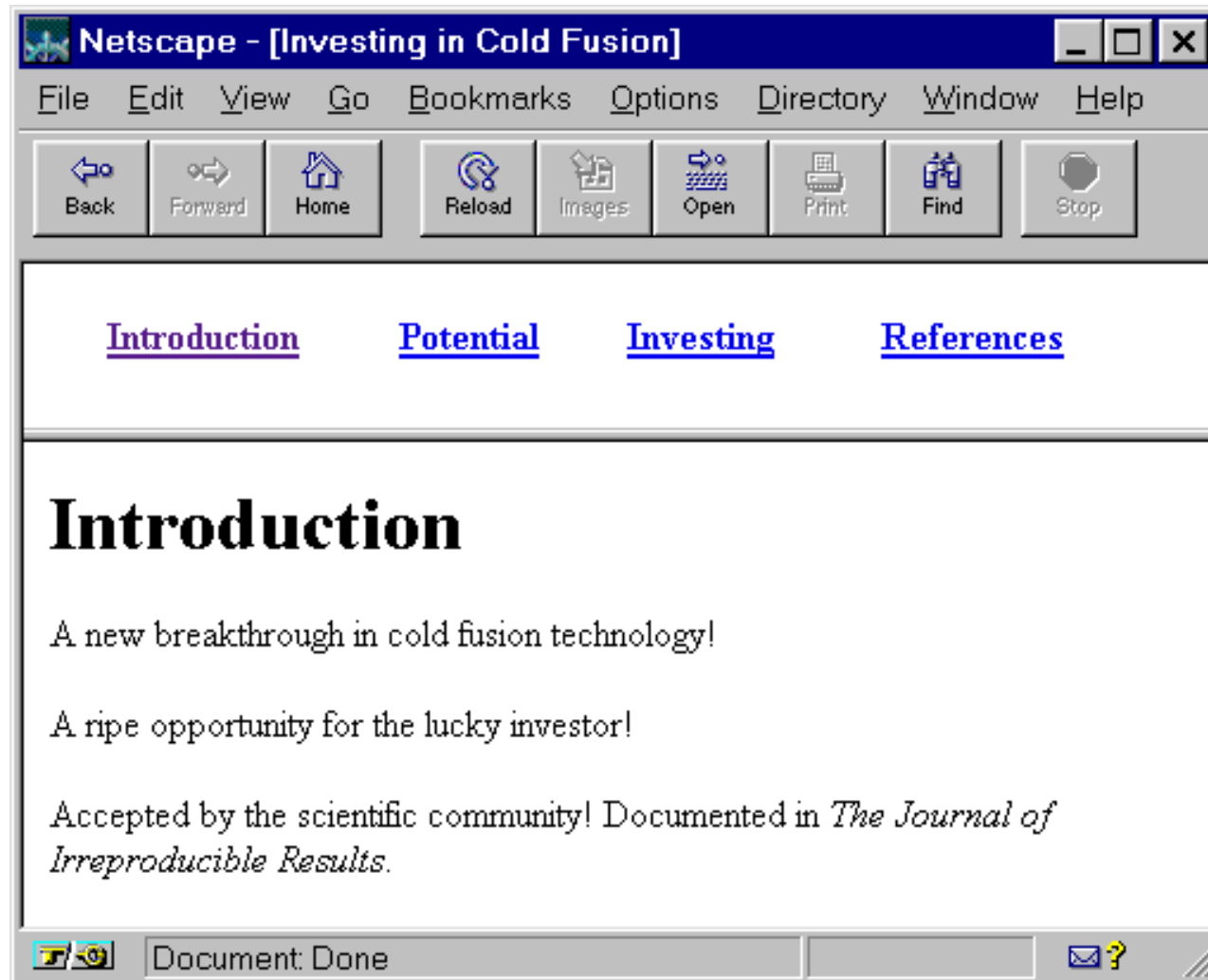
HTML

Frame Example 2, Result

Targeting Frame Cells

- **Specify the cell in which to place a page referenced by a hyperlink**

- **The NAME Attribute of FRAME**

  ```
  <FRAME SRC="..." NAME="cellName">
  ```

- **The TARGET Attribute of A HREF**

  ```
  <A HREF="..." TARGET="cellName">
  ```

Targeting Example

Cold-Fusion.html

```html
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Frameset//EN">
<HTML>
<HEAD>
  <TITLE>Investing in Cold Fusion</TITLE>
</HEAD>
<FRAMESET ROWS="75,*">
  <FRAME SRC="TOC.html" NAME="TOC">
  <FRAME SRC="Introduction.html" NAME="Main">
  <NOFRAMES>
    <BODY>
      This page requires Frames. For a non-Frames version,
      <A HREF="Introduction.html">the introduction</A>.
    </BODY>
  </NOFRAMES>
</FRAMESET>
</HTML>
```

TOC.html

```html
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
  <TITLE>Table of Contents</TITLE>
</HEAD>
<BODY>
<TABLE WIDTH="100%">
  <TR><TH><A HREF="Introduction.html" TARGET="Main">
          Introduction</A></TH>
      <TH><A HREF="Potential.html" TARGET="Main">
          Potential</A></TH>
      <TH><A HREF="Investing.html" TARGET="Main">
          Investing</A></TH>
      <TH><A HREF="References.html" TARGET="Main">
          References</A></TH></TR>
</TABLE>
</BODY>
</HTML>
```
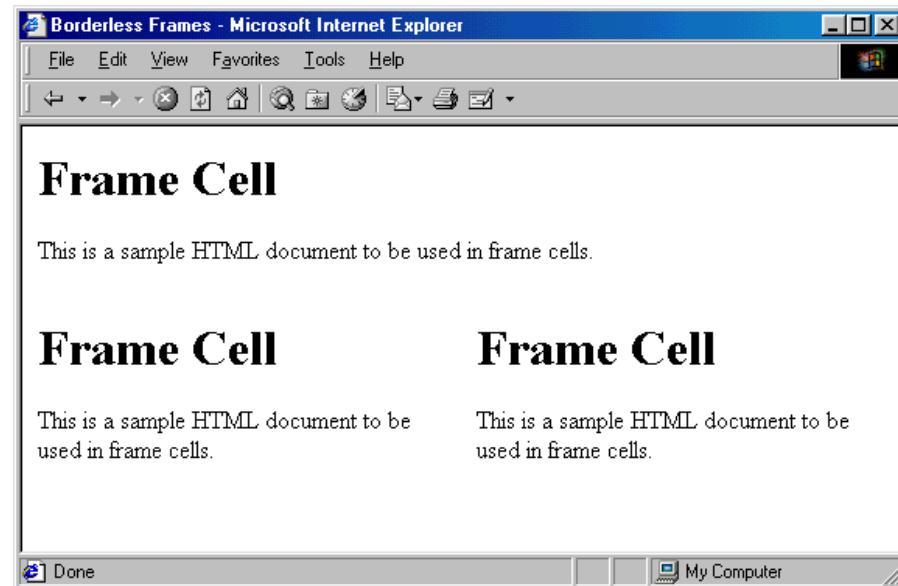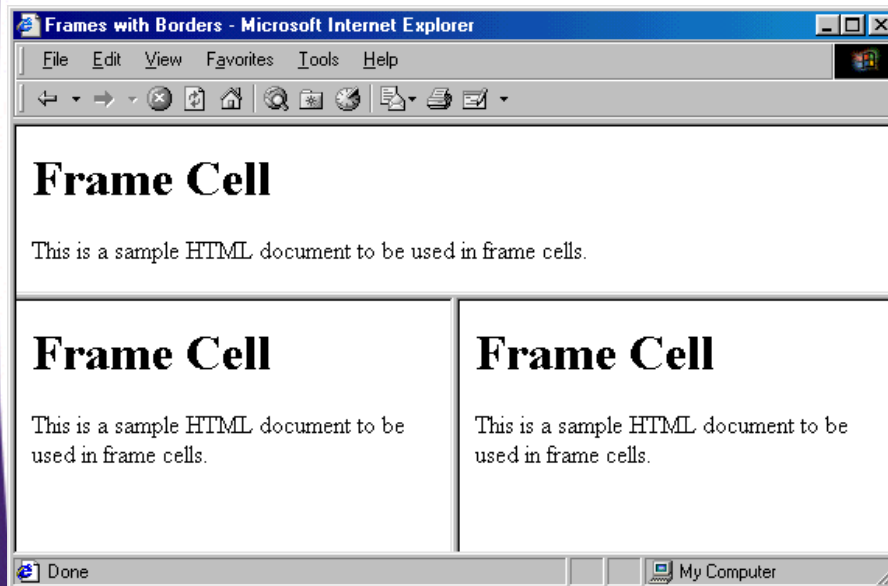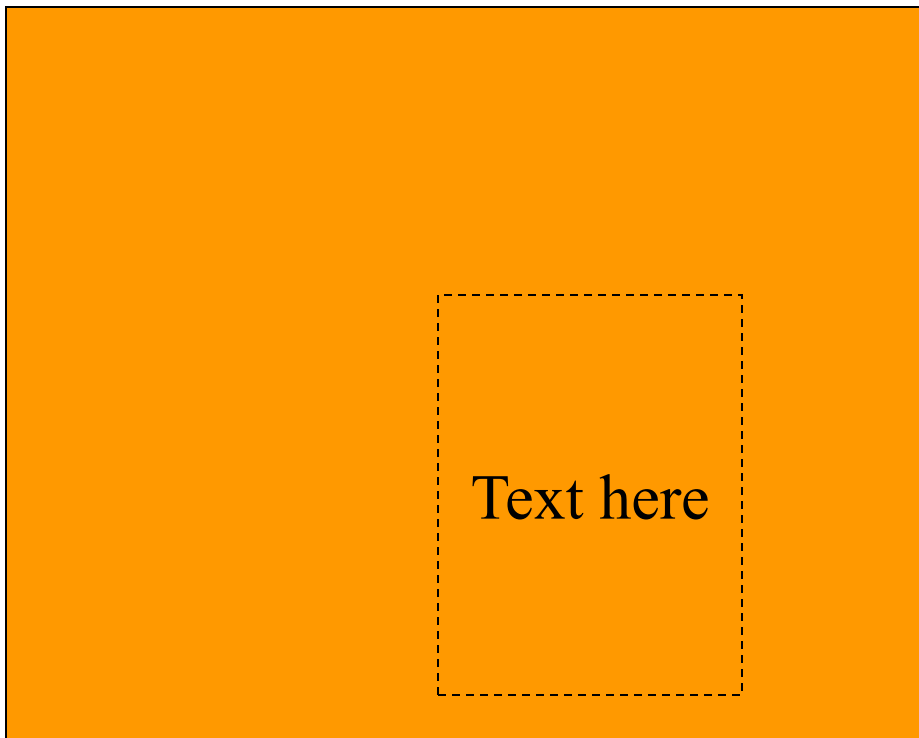
Targeting Example, Results

Predefined Frame Names

- **_blank**
  - Load document into a new browser window
- **_top**
  - Causes the linked document to take up the whole browser window
  - Document will not be contained in a frame cell
- **_parent**
  - Places document in the *immediate* FRAMESET parent
  - Same as _top if no nested frames
- **_self**
  - Place document in current cell
  - Only necessary to override a BASE entry

Floating Frames

- **Defines an inline frame that contains another document**
- **Don't need frame set. Put anywhere in document**
- **<IFRAME attributes ></IFRAME>**
- **Attributes**
  - SRC=URL
  - HEIGHT=pixels|percent,
  - WIDTH=pixels|percent
  - HSPACE=pixels
  - VSPACE=pixels
  - ALIGN=left|right
  - FRAMEBORDER=0

Source: http://www.w3schools.com/TAGS/tag_iframe.asp

DIV and ILAYER

- **Allows you create a position-able block of content.**

Text here

Source: The Small Business

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DIV

- **<DIV attributes> content </DIV>**

- **Attributes**
  - ID="name"
  - STYLE = "style parameters: CSS"

Source: The Small Business Depot

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DIV Example

< DIV ID="fred"
STYLE = "POSITION:absolute|relative;
VISIBILITY:visible:hidden;
Z-INDEX:number;
WIDTH:width in pixels;
HEIGHT:height in pixels;
TOP:pixels from top of page or block;
LEFT:pixels from left edge of page or block;
PADDING:margin in pixels;
other style attributes; " >

content
</DIV>

DIV Example (Cont.)

Source: The Small Business Depot

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DIV Another Example

<div style="position:absolute; left:100px; top:100px; width:100px; height:100px; background-color:#ffffff; ">

Source: The Small Business Depot

Summary

- **Frames require a Frameset DOCTYPE for validation**
- **A FRAMESET can be divided either into columns or rows**
  - To create both rows *and* columns use nested FRAMESETs
- **By giving a FRAME a name, documents can be targeted to the named frame cell**
  - <FRAME … NAME="…">
  - <A HREF="…" TARGET="…">
- **There are four predefined frame names**
  - _blank, _top, _parent, and _self
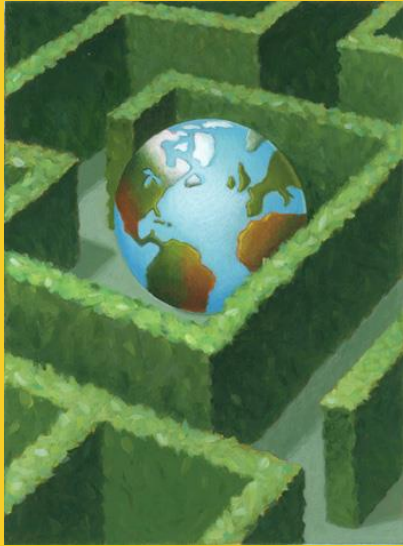
HTML

Cascading Style Sheets

Agenda

- **Specifying style sheet rules**
- **External, internal and inline style specifications**
- **Creating new HTML elements through style sheet classes**
- **Specifying font and text properties**
- **Controlling foreground and background properties**
- **Netscape LAYERs**
- **Creating layers through style sheets**

Benefits of Cascading Style Sheets

- **Powerful and flexible way to specify the formatting of HTML elements**
  - Can define font, size, background color, background image, margins, etc.
- **Share style sheets across multiple documents or entire Web site**
- **Can specify a class definition for a style, effectively defining new HTML elements**
- **Rules are applied in a hierarchical manner (precedence rules)**

Cascading Style Sheets

- **CSS, Level 1 (1996)**
  - Concerned with applying simple styles to HTML elements
  - http://www.w3.org/TR/REC-CSS1
- **CSS, Level 2 (1998)**
  - Supports media-specific style sheets (visual browsers, aural devices, printers, braille devices)
  - http://www.w3.org/TR/REC-CSS2
- **CSS, Level 3 (draft 2001)**
  - Focused on modularization of the CSS specification
  - http://www.w3.org/TR/css3-roadmap/

- **Note:**
  - CSS1 is supported by Netscape and Internet Explorer 4.x and above
  - See http://www.webreview.com/style/css1/charts/mastergrid.shtml for a summary of browser compatibility

Specifying Style Rules

- ## General form of rule

```
selector { property: value }
```

  or

```
selector { property1: value1;
           property2: value2;
           ...
           propertyN: valueN }
```

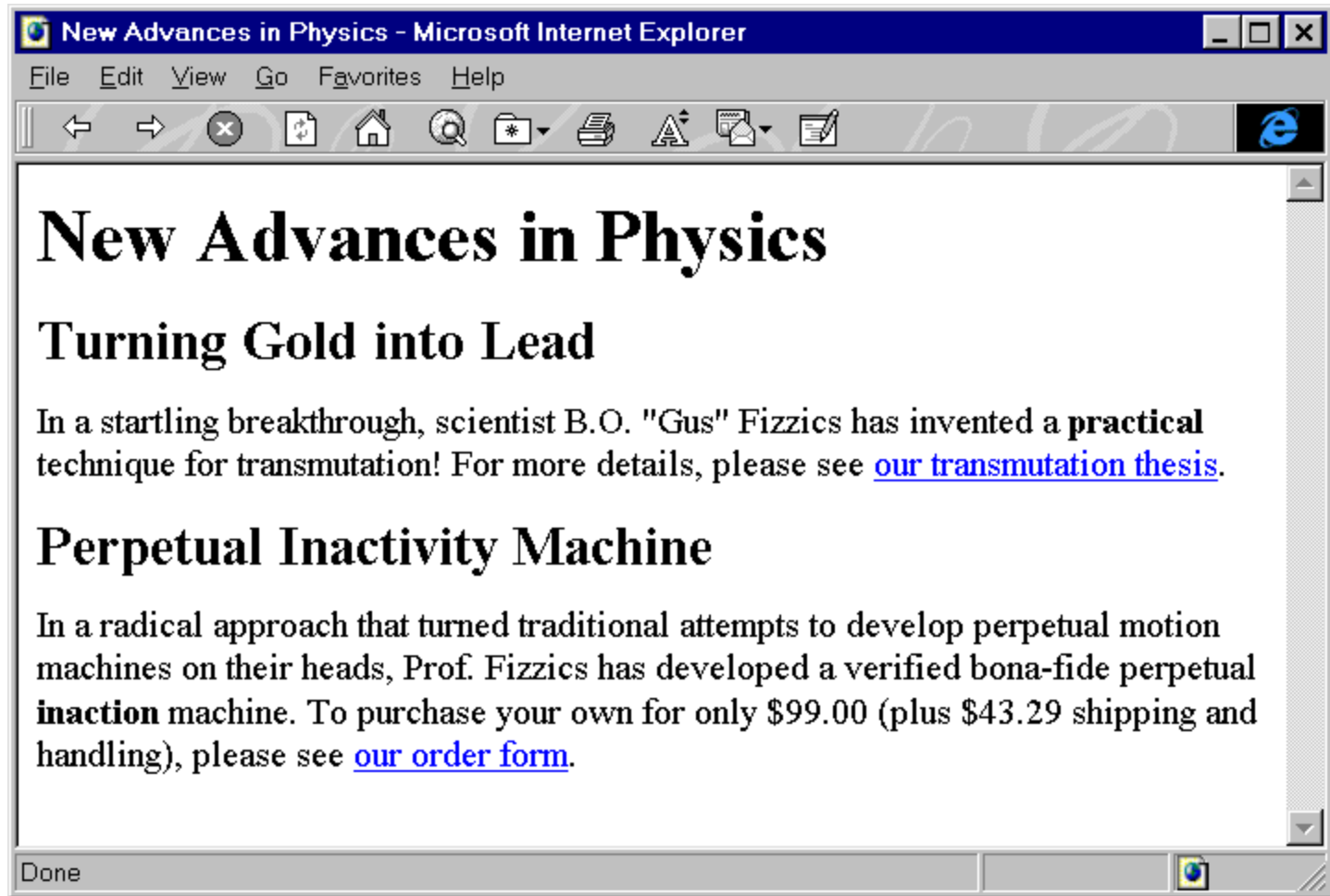- ## Example

```
H1 { text-align: center;
     color: blue }
```

Fizzics1.html, Example (no style sheet)

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
  <TITLE>New Advances in Physics</TITLE>
</HEAD>
<BODY>
<H1>New Advances in Physics</H1>

<H2>Turning Gold into Lead</H2>
In a startling breakthrough, scientist B.O. "Gus" Fizzics
has invented a <STRONG>practical</STRONG> technique for
transmutation! For more details, please see
<A HREF="give-us-your-gold.html">our transmutation thesis</A>.
...

</BODY>
</HTML>
```

Fizzics1.html, Result (no style sheet)

New Advances in Physics - Microsoft Internet Explorer

File   Edit   View   Go   Favorites   Help

New Advances in Physics

Turning Gold into Lead

In a startling breakthrough, scientist B.O. "Gus" Fizzics has invented a **practical** technique for transmutation! For more details, please see our transmutation thesis.

Perpetual Inactivity Machine

In a radical approach that turned traditional attempts to develop perpetual motion machines on their heads, Prof. Fizzics has developed a verified bona-fide perpetual **inaction** machine. To purchase your own for only $99.00 (plus $43.29 shipping and handling), please see our order form.

Done

Fizzics2.html, Example (with style sheet)

- **Style information**

```
<HEAD>
  <TITLE>Document Title</TITLE>
  <STYLE TYPE="text/css">
  <!--
  BODY { background: URL(images/confetti-background.jpg) }
  H1 { text-align: center;
       font-family: Blackout }
  H2 { font-family: MeppDisplayShadow }
  STRONG { text-decoration: underline }
  -->
  </STYLE>
</HEAD>
```
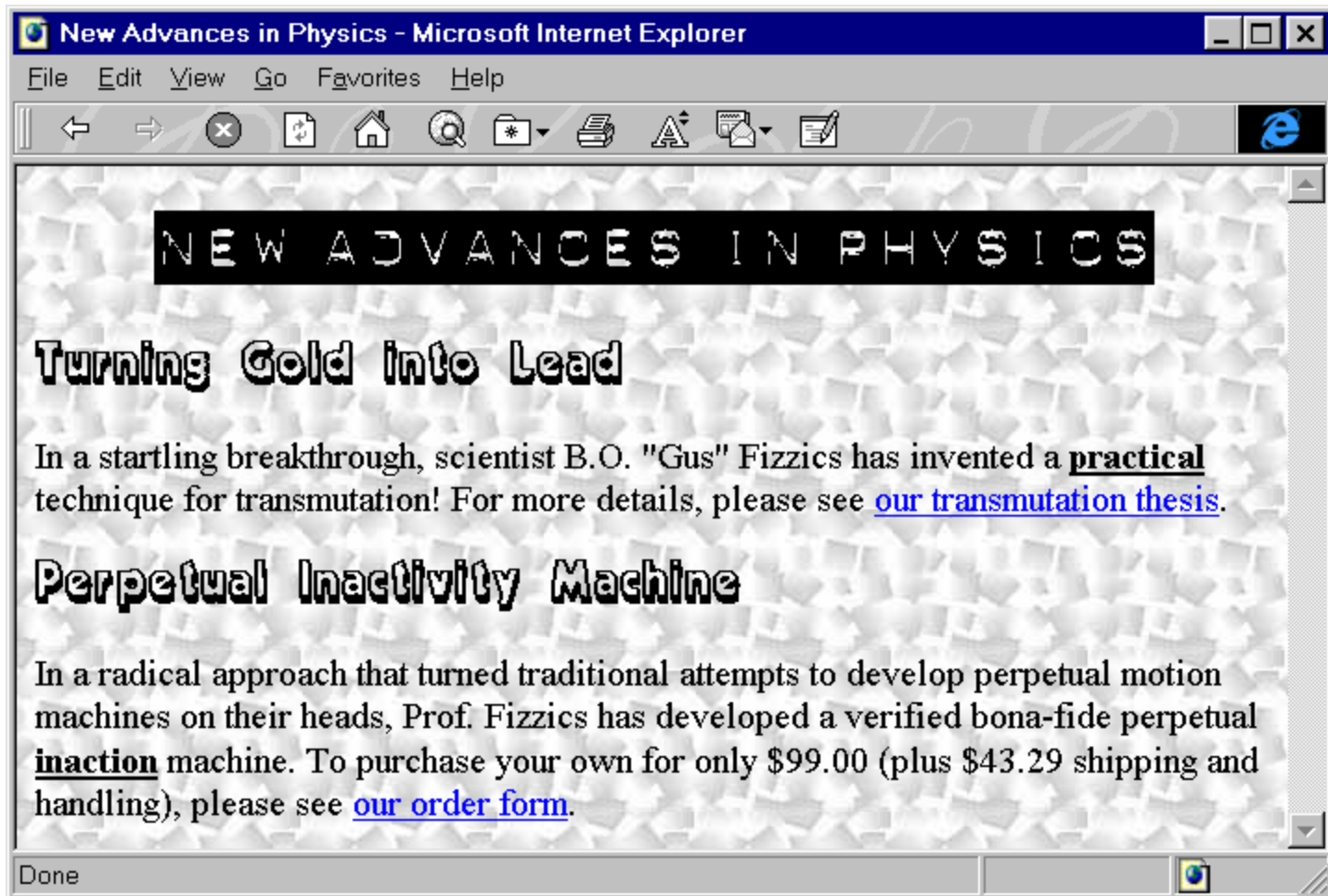
Fizzics2.html, Result (with style sheet)

External Style Sheets

- ## Specify link to external style sheet in the HEAD section of the HTML document

```
<LINK REL=STYLESHEET
     HREF="Sitestyle.css" // Absolute or relative link
     TYPE="text/css">
```

- ## Sitestyle.css

```
/* Example of an external style sheet */

H1 { text-align: center;
     font-family: Arial
}
H2 { color: #440000;
     text-align: center;
     font-family: Arial Black, Arial, Helvetica, sans-serif
}

...
```

Inline Style Specification

- **Use the STYLE attribute defined for each HTML element to directly specify the style**
- **Example**

```
...
<H1>New Advances in Physics</H1>
<P STYLE="margin-left: 0.5in;
          margin-right: 0.5in;
          font-style: italic">
This paper gives the solution to three
previously unsolved problems: turning lead into gold,
antigravity, and a practical perpetual motion machine.
...
```

Defining Style Classes

- **To define an *element* style class proceed the HTML element by a period and class name**

```
// Define an "abstract" paragraph type
P.abstract { margin-left: 0.5in;
             margin-right: 0.5in;
             font-style: italic }
```

- **To use, supply the name of the style class in the CLASS attribute of the HTML element**

```
<H1>New Advances in Physics</H1>
<P CLASS="abstract">
This paper gives the solution to three previously
unsolved problems: turning lead into gold,
antigravity, and a practical perpetual motion machine.
```

Defining Style Classes

- **To define a *global* style class, omit the element name**

```
// Style available to all elements
.blue { color: blue; font-weight: bold }
```

- **To use, simple specify the style class in the CLASS attribute of the HTML element**

```
<H2 CLASS="blue">A Blue Heading</H2>

<!-- Apply to a section of text -->
This text is in the default color, but
<SPAN CLASS="blue">this text is blue.</SPAN>
```

Defining Styles through User-Defined IDs

- **An ID is like a class but can be applied only once in a document**

```
<HEAD>
<TITLE>...</TITLE>
<STYLE TYPE="text/css">
<!--
#foo { color: red }
-->
</STYLE>
</HEAD>
<BODY>
...
<P ID="foo">
...
</BODY>
```

Style Sheet Precedence Rules

1. **Rules marked "important" have the highest priority (rarely used)**

```
H1 { color: black !important;
     font-family: sans-serif }
```

2. **Author rules have precedence over reader rules**

- Style sheet rules override browser preferences

Style Sheet Precedence Rules, cont.

3. **More specific rules have precedence over less specific rules**

```
#foo { ... }        // ID selector highest priority
P.big H1 { ... }  // Class higher over element
P STRONG { ... }  // Two tags higher than single tag
STRONG H1 { ... }
```

4. **In case of tie, the last rule has priority**

Useful Font Properties

- ## font-weight
  - Relative weight (boldness) of font
  - **normal** | lighter | bold | bolder | 100 | 200 | ... | 900

  ```
  H1 { font-weight : 200 }
  H2 { font-weight : bolder }
  ```

- ## font-style
  - Font face type within a family
  - **normal** | italic | oblique

  ```
  P  { font-style : normal }
  TH { font-sytle : italic }
  ```

Useful Font Properties, cont.

- **font-size**
  - Either relative or absolute size of font
  - pt, pc, in, cm, mm | em, ex, px, % | xx-large | x-large | large | **medium** | small | x-small | xx-small | smaller | larger

```
STRONG { font-size: 150% }
P { font-size: 14pt }
P { font-size: xx-large }
```

- **font-family**
 - Typeface family for the font

```
H1 { font-family: Arial }
```

CampBearClaw.html, Example

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
  <TITLE>Camp Bear Claw</TITLE>
  <LINK REL=STYLESHEET HREF="CampBearClaw.css" TYPE="text/css">
</HEAD>
<BODY>
<H1>Camp Bear Claw</H1>
We have the following activities:
<H2 CLASS="archery">Archery</H2>
<H2 CLASS="arts">Arts and Crafts</H2>
<H2 CLASS="horseback">Horseback Riding</H2>
<H2 CLASS="hiking">Hiking</H2>
<H2 CLASS="campfire">Campfire Song Times</H2>
<H2 CLASS="java">Java Programming</H2>
</BODY>
</HTML>
```

CampBearClaw.css

```
H1 { text-align: center;
     font-family: Funstuff }
H2.archery { font-family: ArcheryDisplay }
H2.arts { font-family: ClampettsDisplay }
H2.horseback { font-family: Rodeo }
H2.hiking { font-family: SnowtopCaps }
H2.campfire { font-family: Music Hall }
H2.java { font-family: Digiface }
```

CampBearClaw.html, Result
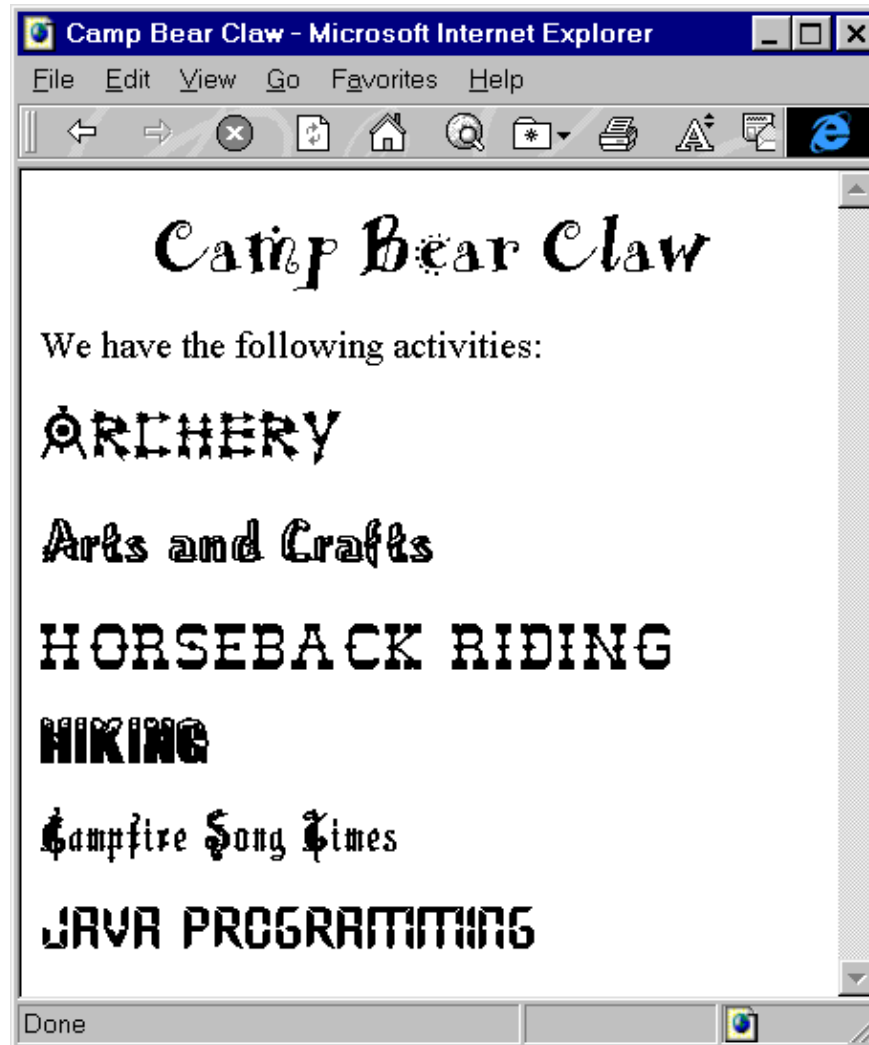
Useful Text Properties

- ## text-decoration
  - Describes text additions or "decorations" that are added to the text of an element
  - **none** | underline | overline | line-through | blink

    ```
    P { text-decoration: underline }
    ```

- ## vertical-align
  - Determines how elements are positioned vertically
  - top | bottom | **baseline** | middle | sub | super | text-top | text-bottom | %

- ## text-align
  - Determines how paragraphs are positioned horizontally
  - **left** | right | center | justify

Useful Text Properties, cont.

- **text-indent**
  - Specifies the indentation of the *first* line of the paragraph
  - +/– pt, pc, in, cm, mm | +/– em, ex, px, %

```
P { text-indent: -25px } /* Hanging indent */
```

- **line-height**
  - Specifies the distance between two consecutive baselines in a paragraph
  - **normal** | number | pt, pc, in, cm, mm | em, ex, px, %

```
.double { line-height: 200% }
.triple { line-height: 3 } /* 3x the font size */
DIV { line-height: 1.5em }
```

Bates.html

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
   <TITLE>An Open Letter to the IRS</TITLE>
   <LINK REL=STYLESHEET HREF="Bates.css" TYPE="text/css">
</HEAD>
<BODY BACKGROUND="images/bond-paper.jpg">
<P CLASS="rhead">
April 1, 2001
<HR>
<P CLASS="rhead">
William A. Bates<BR>
Macrosoft Corporation<BR>
Blumond, WA 12345
<P CLASS="lhead">
Internal Revenue Service<BR>
Philadelphia, PA 67890
<P>
<BR>
Dear Sirs,
<P CLASS="body">
I am writing to inform you that, due to financial difficulties,
...
```

Bates.css

```
P { margin-top: 5px }
P.rhead { text-align: right;
          margin-right: 0.5in;
          font-family: sans-serif }
P.lhead { font-family: sans-serif }
P.body { text-align: justify;
         text-indent: 0.5in }
P.foot { margin-left: 60%;
         line-height: 300% }
```

Bates.html
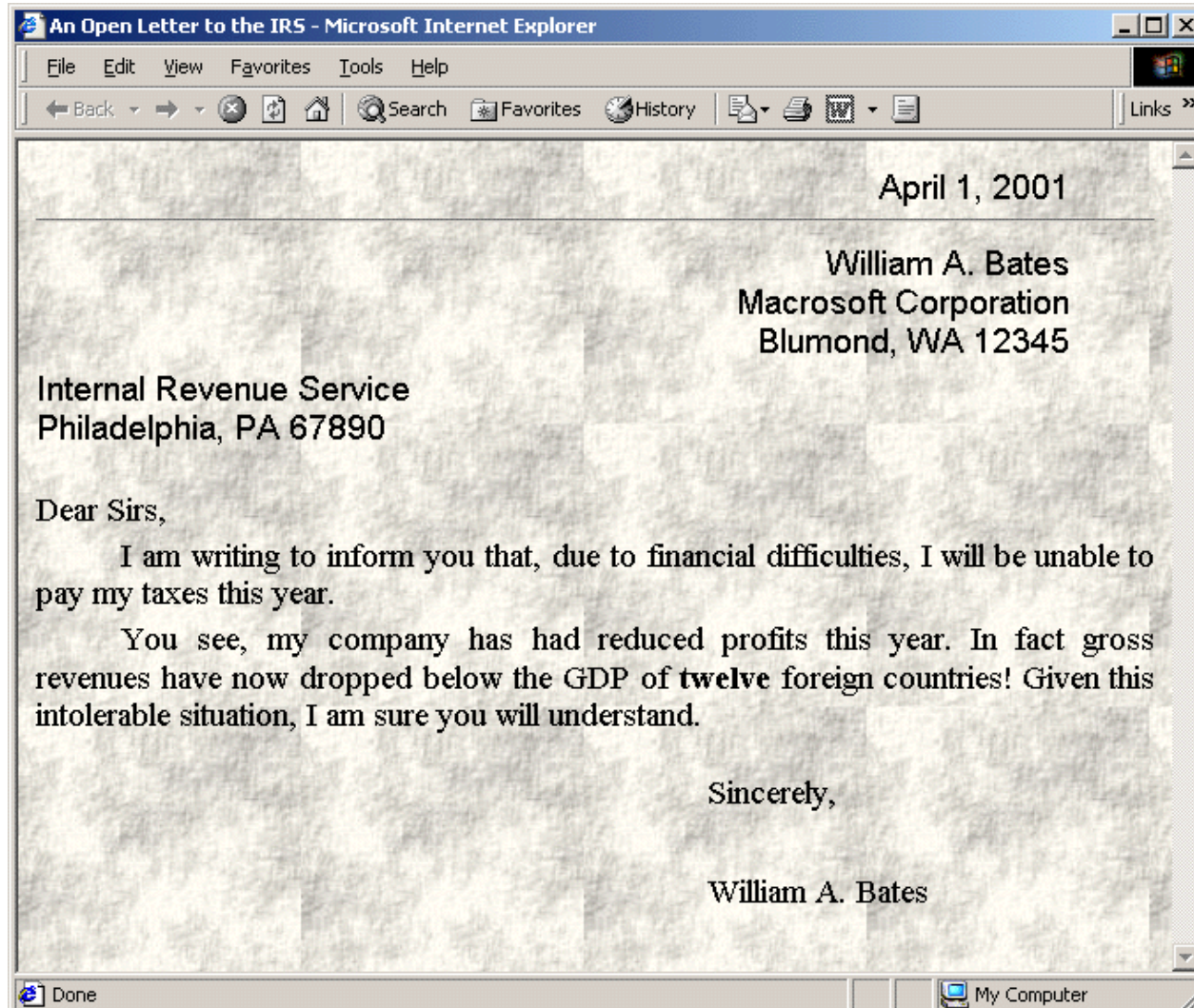
Useful Foreground and Background Properties

- ## color
  - Color of the text or foreground color
  - color-name | #RRGGBB | #RGB | rgb(rrr, ggg, bbb) | rgb(rrr%, ggg%, bbb%)

  ```
  P  { color : blue }
  H1 { color : #00AABB }
  H3 { color : rgb(255, 0, 0 ) } /* red */
  ```

- ## background-image
  - **none** | url(*filename*)
  - Specifies an image to use as the background of region

  ```
  H2 { background-image: url(Bluedrop.gif);}
  ```

Useful Foreground and Background Properties, cont.

- ## background-repeat
  - Specifies how to tile the image in the region
  - **repeat** | repeat-x | repeat-y | norepeat

    ```
    BODY {
      background-image: url(Bluedot.gif);
      background-repeat: repeat-x;
    }
    ```

- ## background
  - Lets you combine properties in a single entry

    ```
    P { background: url(wallpaper.jpg) repeat-x }
    ```
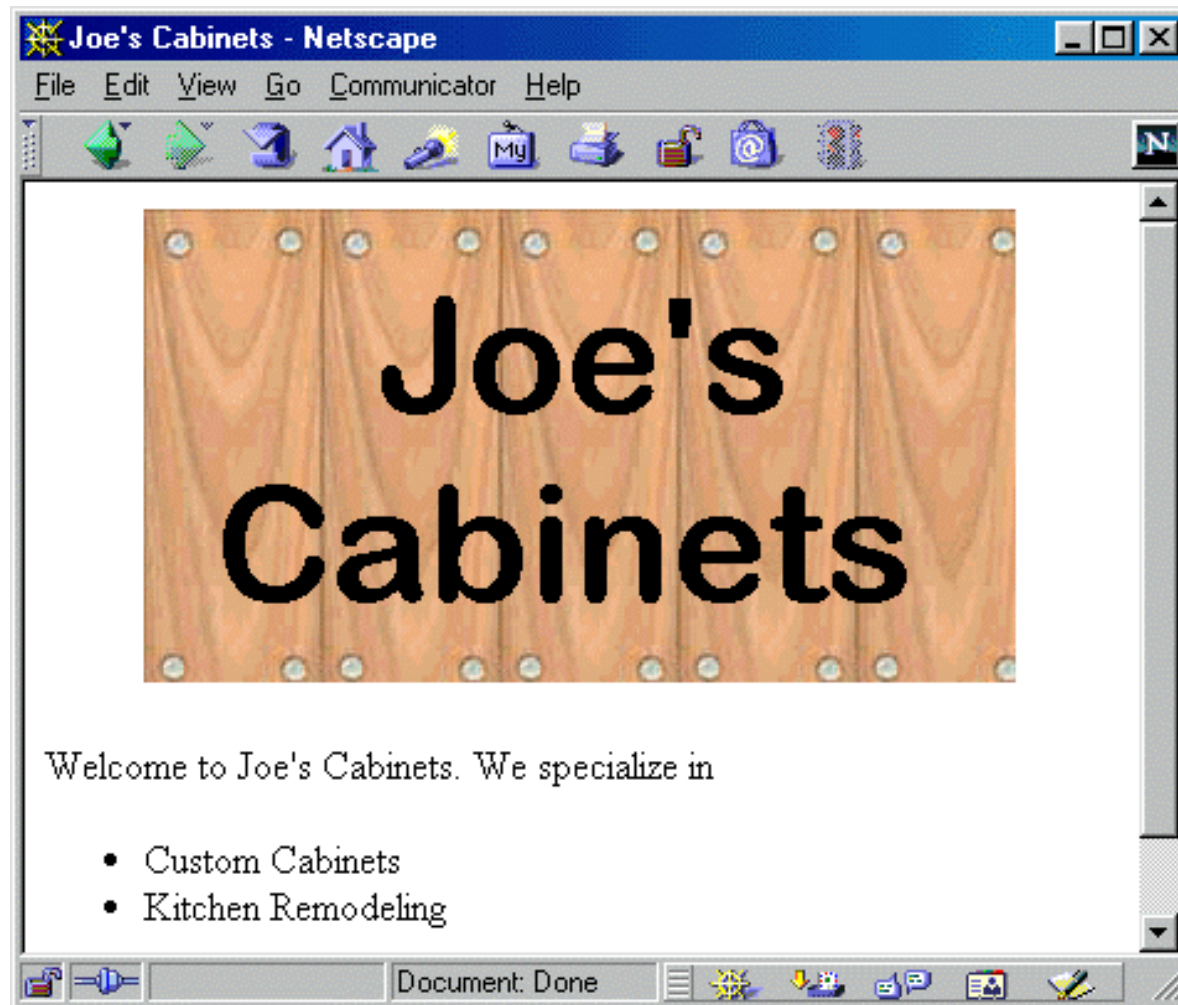
Cabinets.html, Example

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
  <TITLE>Joe's Cabinets</TITLE>
  <LINK REL=STYLESHEET HREF="Cabinets.css" TYPE="text/css">
</HEAD>
<BODY>
<CENTER>
<TABLE WIDTH=360 HEIGHT=199>
  <TR><TD ALIGN="CENTER" CLASS="banner">Joe's Cabinets
</TABLE>
</CENTER>
<P>
Welcome to Joe's Cabinets. We specialize in
<UL>
  <LI>Custom Cabinets
  <LI>Kitchen Remodeling
  <!-- Etc -->
</UL>
<!-- Etc -->
</BODY>
</HTML>
```

Cabinets.css

```
.banner { background: url(images/boards.jpg) repeat-x;
          font-size: 50pt;
          font-family: Arial Rounded MT Bold }
```
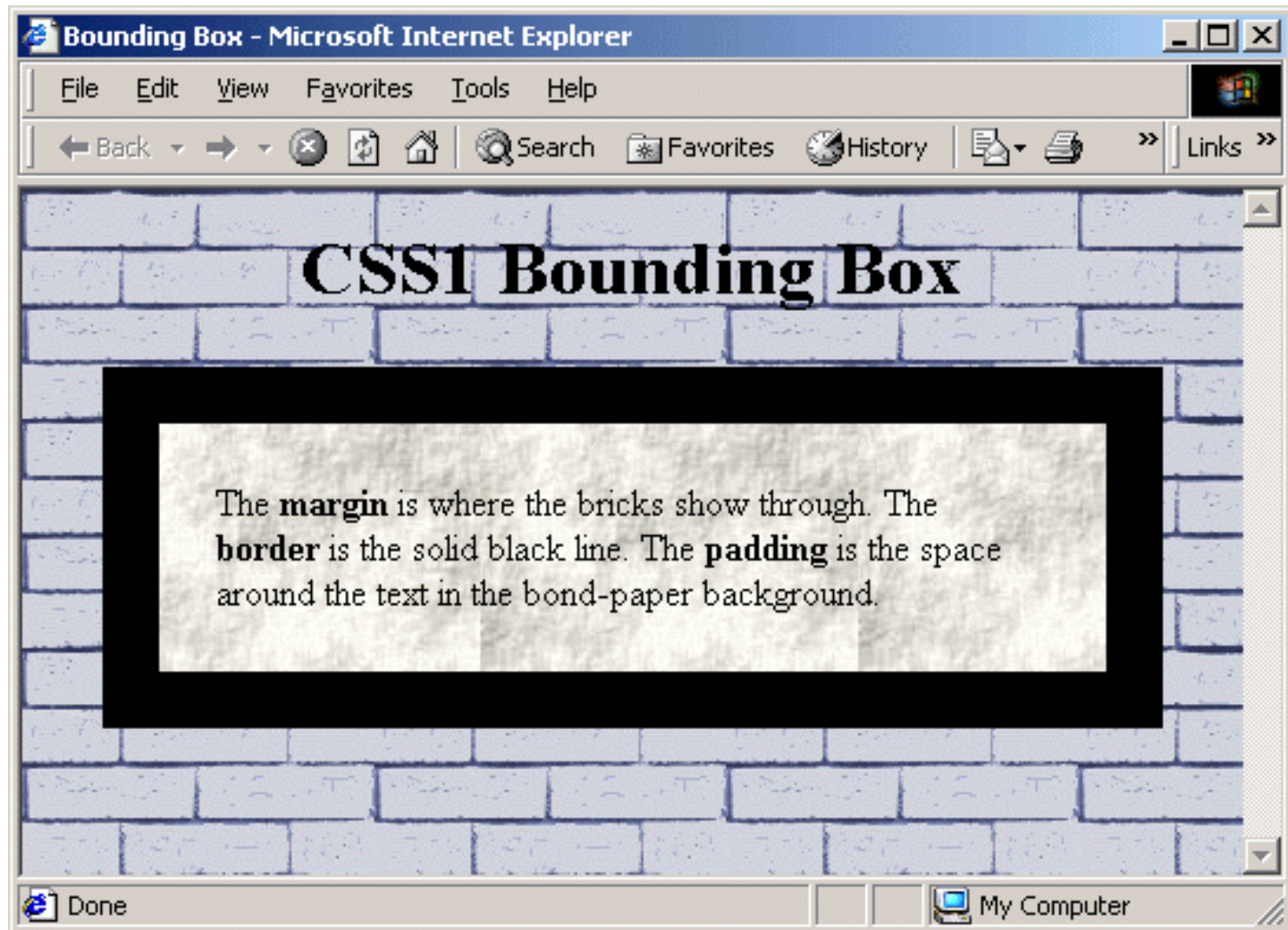
Cabinets.html, Result

Properties of the Bounding Box

- **CSS assume that all elements result in one or more rectangular regions (bounding box)**
- **Styles can specify the margins, borders, and padding of the bounding box**

```
P { margin: 0.25in;
    border: 0.25in solid black;
    padding: 0.25in;
    background: URL(images/bond-paper.jpg) }
```

The Bounding Box

Images and Floating Elements

- **width, height**
  - Specify a fixed size for an element (usually an image)
  - **auto** | pt, pc, in, cm, mm | em, ex, px

```
IMG.bullet { width: 50px; height: 50px }
```
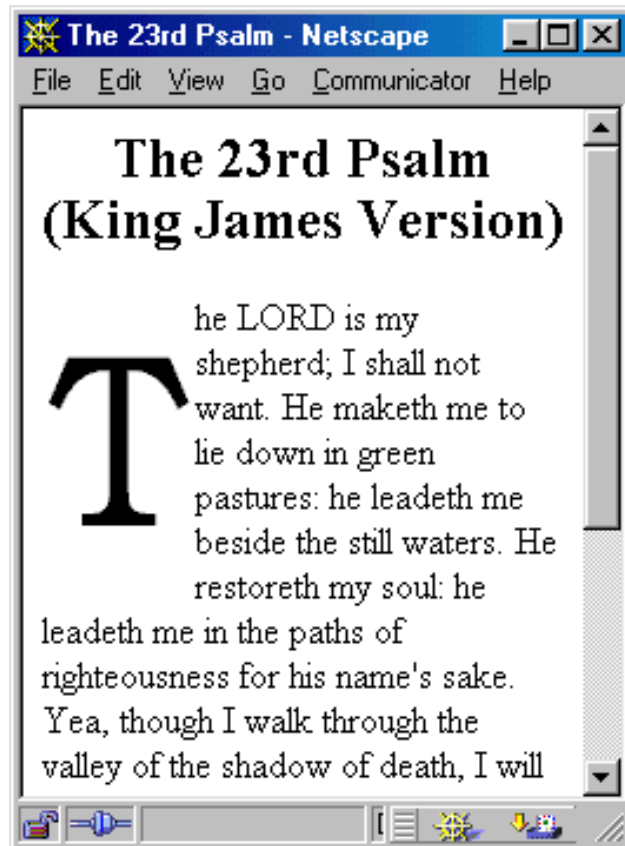
- **float**
  - This property lets elements float into the left or right margins where the text wrapping arounds
 - **none** | left | right

Psalm23.html

```html
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
  <TITLE>The 23rd Psalm</TITLE>
<STYLE>
<!--
SPAN { float: left;
       font-family: "Cushing Book";
       font-size: 75pt }
-->
</STYLE>
</HEAD>
<BODY>
<H2 ALIGN="CENTER">
The 23rd Psalm (King James Version)</H2>
<SPAN>T</SPAN>he LORD is my shepherd; I shall not want.
He maketh me to lie down in green pastures: he leadeth me
beside the still waters. He restoreth my soul: he leadeth me
in the paths of righteousness for his name's sake. Yea,
```
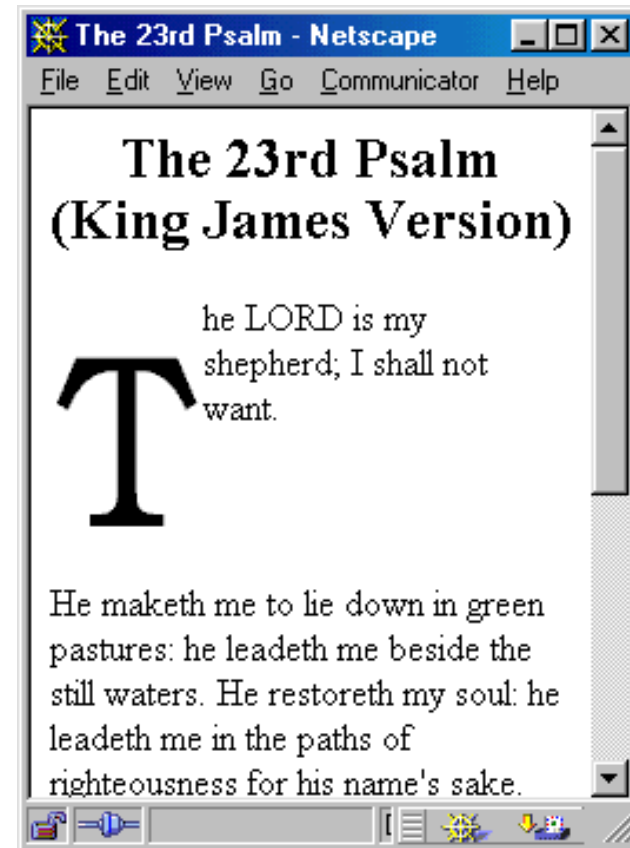
Psalm23.html, Result

The float property can be used to implement "drop caps"

Effect of Paragraph Breaks, Example, cont.
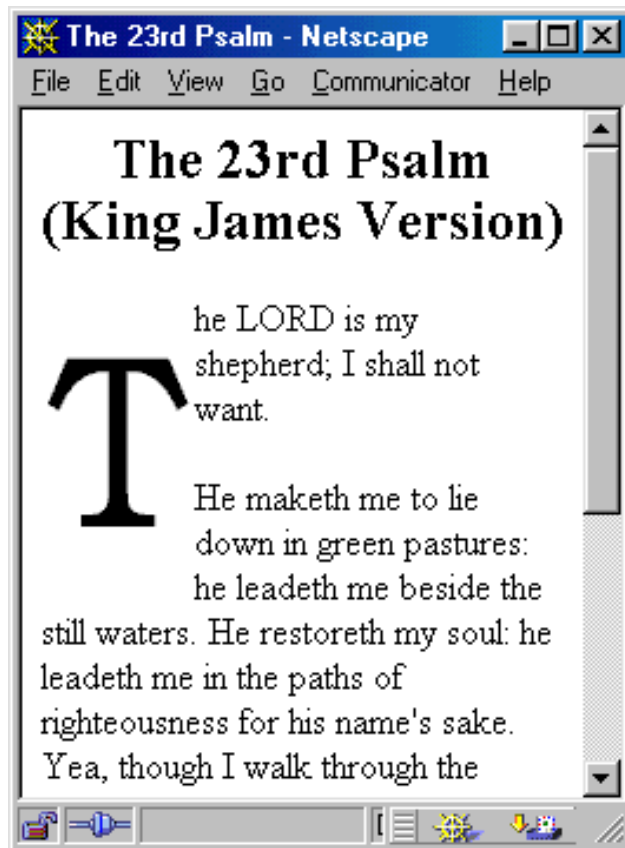
Adding a `<P>` element simply continues the flow

Adding `<P STYLE="clear: left">` forces the next paragraph to start after the floating element

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Summary

- **Through style sheets you can specify the general formatting of HTML elements**

- **Use external style sheets to share styles across all documents in the Web site**

- **Class definitions allow you to define multiple styles for an HTML element**