

# HyperText Markup Language (HTML)

Designing Documents for the World Wide Web

Customized Java EE Training: http://courses.coreservlets.com/

Servlets, JSP, JSF 1.x & JSF 2.0, Struts Classic & Struts 2, Ajax, GWT, Spring, Hibernate/JPA, Java 5 & 6. Developed and taught by well-known author and developer. At public venues or onsite at *your* location.





© 2009 Marty Hall

For live Java training, please see training courses at http://courses.coreservlets.com/. Servlets, JSP, Struts Classic, Struts 2, JSF 1.x, JSF 2.0, Ajax (with jQuery, Dojo, Prototype, Ext, etc.), GWT, Java 5, Java 6, Spring, Hibernate/JPA, and customized combinations of topics.

Taught by the author of *Core Servlets and JSP*, *More Servlets and JSP*, and this tutorial. Available at public venues, or customized versions can be held on-site at <u>your</u> organization. Contact hall@coreservlets.com for details.

## 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
- Differences between XHTML and HTML 4

4

© 2009 Marty Hall



## **General**

Customized Java EE Training: http://courses.coreservlets.com/

Servlets, JSP, JSF 1.*x* & JSF 2.0, Struts Classic & Struts 2, Ajax, GWT, Spring, Hibernate/JPA, Java 5 & 6. Developed and taught by well-known author and developer. At public venues or onsite at *your* location.

## 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
  - Lâyout
  - Content (Can't Enforce an Exact Look)
- Changes in HTML 3.2 to HTML 4.0
  - Standardization of frames

  - Deprecation of frames
    Deprecation of formatting elements (vs. style sheets)
    Improved cell alignment and grouping in tables
    Mouse and keyboard events for nearly all elements
    Internationalization features

## **HTML Example**

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
                                                 ☑ Home Page for Marty Hall - Netscape
_ Elle Edit View ☑o Bookmarks Iools Window Help
<HEAD>
<TITLE>Home Page for Marty Hall</TITLE>
                                                   <BODY BGCOLOR="#FDF5E6" TEXT="#000000" LI
      VLINK="#551A8B" ALINK="#FF0000">
                                                         Home Page for Marty Hall
<CENTER>
<TABLE BORDER=3 BGCOLOR="#3366FF">
  <TR><TD><STRONG CLASS="title">Home Page
</TABLE>
<P>
                                                     President
                                                     coreservlets.com, Inc.
<TABLE>
                                                     6 Meadowsweet Ct., Suite B1
  <TR><TD><STRONG><B>Marty Hall</B><BR>
                                                     Reisterstown, MD 21136-6020
      President<BR>
                                                     email: hall@coreservlets.com
       <A HREF="http://www.coreservlets.com
                                                     Phone: (410) 429-5535
                                                     Fax: (410) 429-4931
      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 file in an accessible directory
  - This is public\_html on the APL server
- 3. Access the web page through http://hostname/~username/filename
  - E.g., on APL system: http://www.apl.jhu.edu/~hall/test.html
  - If the filename is omitted, a system default filename is assumed (index.html on the APL server)
    - 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.

10

## **HTML 4: Document Template**

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
                                             Goes on browser's title bar
  <TITLE>Title</TITLE>
                                             May not appear in printouts
</HEAD>
<BODY>
                                          Main heading. Often used as title
<H1>Main Heading</H1>
                                          Appears in printouts
                                               HTML comment
                                               Replace with body of
<!-- Rest of page goes here -->
                                               WWW page
</BODY>
                                                    _ | D | X
              Title - Netscape
</HTML>
               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

12

## 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>



# Block-Level Elements (Paragraph-Like Elements)

Customized Java EE Training: http://courses.coreservlets.com/

Servlets, JSP, JSF 1.*x* & JSF 2.0, Struts Classic & Struts 2, Ajax, GWT, Spring, Hibernate/JPA, Java 5 & 6. Developed and taught by well-known author and developer. At public venues or onsite at *your* location.

### **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
  - DL
  - DT
  - DD
- Tables and Forms (Postponed)
- Misc.
  - -HR
  - DIV
  - CENTER
  - MULTICOL (Netscape only)

. •

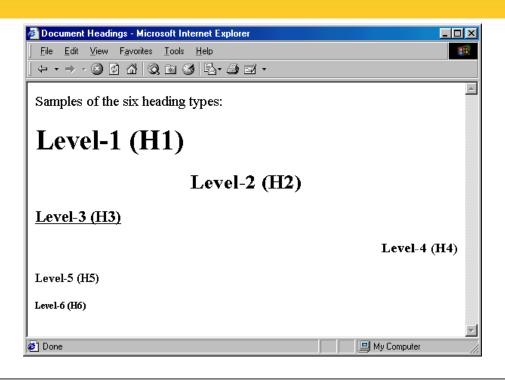
## **Headings**

- 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 in HTML 4:

```
<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** 

20

## **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
<	<
>	>
&	&
II	"
Non-breaking space	

## **OL: Ordered (Numbered) Lists**

#### OL Element

- Attributes: TYPE, START, COMPACT
- List entries: Ll

</OL>

- <LI ...> ... </LI> (End Tag Optional)

## **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
        <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
             The LI tag
      C. Definition
             1. The DL tag
             The DT tag
             3. The DD tag
IV. Miscellaneous
```

## **UL: Unordered (Bulleted) Lists**

#### UL Element

```
- <UL>
<LI>...
<LI>...
```

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

```
- TAY Primite Diffet; CIRCL A sample list:

<UL>

<LI>List Item One

<LI>List Item Two

<LI>List Item Two

<LI>List Item Three

</UL>
```

## **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

CIRCLE

SQUARE

COMPACT

The LI tag

TYPE

CIRCLE

CIRCLE

SQUARE

VALUE
```



## **Text-Level Elements** (Font-Like Elements)

Customized Java EE Training: http://courses.coreservlets.com/

Servlets, JSP, JSF 1.x & JSF 2.0, Struts Classic & Struts 2, Ajax, GWT, Spring, Hibernate/JPA, Java 5 & 6. Developed and taught by well-known author and developer. At public venues or onsite at *your* location.

## **Text-Level Elements**

- Physical Character Styles
  - B, I, TT, U, SUB, SUP, SMALL, BIG, STRIKE, S, 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

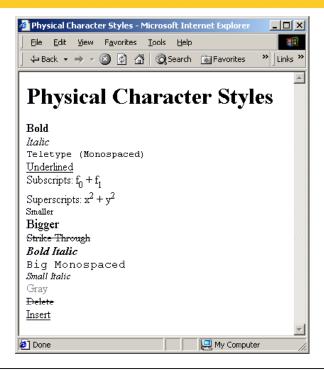
- BR (Explicit line break)
- AREA (Client-side image maps)
- APPLET (Java),
- **–** ...

28

## 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

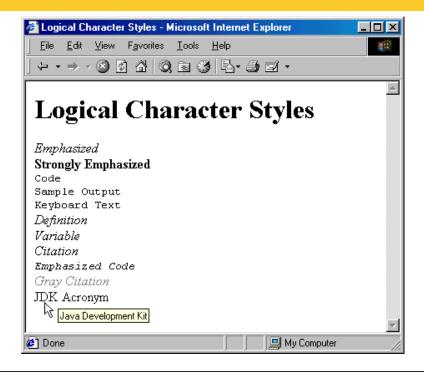


30

## 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**



**Hypertext Links** 

- Links can contain images and other textlevel 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 wrt 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>

34

## **IMG: Embedding Images**

#### Example

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

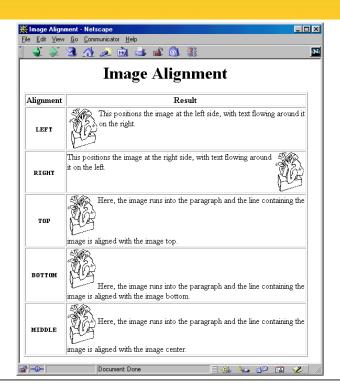
#### Attributes:

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

## Image Alignment, Example

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<hea><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 Caption		
Heading1	Heading2	
Row1 Col1 Data	Row1 Col2 Data	
Row2 Col1 Data	Row2 Col2 Data	
Row3 Col1 Data	Row3 Col2 Data	

38

### **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

40

## **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 DUC (might)

## **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	

12

## **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

Col 1 &2 Heading	CoB Heading
Coll Data Coll Data	Col3 Data

11

## 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



## **XHTML**

Customized Java EE Training: http://courses.coreservlets.com/

Servlets, JSP, JSF 1.*x* & JSF 2.0, Struts Classic & Struts 2, Ajax, GWT, Spring, Hibernate/JPA, Java 5 & 6. Developed and taught by well-known author and developer. At public venues or onsite at *your* location.

## **XHTML:** Basic Template

XML header recommended by xhtml specification, but you should omit because of Internet Explorer bug.

## **XHTML: Case**

- In HTML 4, case does not matter for tag names and attribute names
  - <BODY>, <Body>, and <body> are equivalent
  - <H1 ALIGN="..."> is equivalent to <H1 aLiGn="...">
- In xhtml, tag names and attribute names must be in lower case
  - <body>, <h1 align="...">

48

## **XHTML: Quotes**

- In HTML 4, quotes are optional if attribute value contains only alphanumeric values
  - <H1 ALIGN="LEFT"> or <H1 ALIGN=LEFT>
- In xhtml, you must always use single or double quotes
  - <h1 align="left"> or <h1 align='left'>

## **XHTML: End Tags**

#### HTML 4

- Some tags are containers
  - <H1>...</H1>, <A HREF...>...</A>
- Some tags are standalone
  - <BR>, <HR>
- Some tags have optional end tags
  - <P>, <LI>, <TR>, <TD>, <TH>

#### XHTML

- All tags are containers. End tags always required.
  - ..., ...
- If there is no body content, start/end tags can be merged
  - <br>></br> or just <br/>

50

## **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

© 2009 Marty Hall



## **Questions?**

#### Customized Java EE Training: http://courses.coreservlets.com/

Servlets, JSP, JSF 1.*x* & JSF 2.0, Struts Classic & Struts 2, Ajax, GWT, Spring, Hibernate/JPA, Java 5 & 6. Developed and taught by well-known author and developer. At public venues or onsite at *your* location.