**HTML & Web Pages**

*recall*: a Web page is a text document that contains additional formatting information in the HyperText Markup Language (HTML)

- HTML specifies formatting within a page using *tags*
- in its simplest form, a tag is a word or symbol surrounded by brackets (<>)

A Web page is a text document that contains HTML formatting.

A Web browser is a program that interprets the HTML and displays the page.
HTML Tags

required tags in a Web page:

- `<html>` and `</html>` enclose the entire HTML document
- the HEAD section (enclosed between `<head>` and `</head>`) contains information that the browser uses to control the look of the page
  - the HEAD can contain a title for the browser window, enclosed between `<title>` and `</title>`
- the BODY section (enclosed between `<body>` and `</body>`) contains the text that will appear in the page

```
1. <!doctype html>
2. <!--[-- demo1.html               Dave Reed -->
3. <!--[-- This is a simple Web page. -->
4. <!--[-- -------------------------------------------------- -->
5.
6. <html>
7. <head>
8.  <title> Title of the Page </title>
9.  </head>
10. <body>
11.  Text that appears in the page.
12. </body>
13. </html>
```
**HTML Elements**

tags and the text they enclose form an *HTML element*

```html
<title>Title of the Page</title>  is a TITLE element

<head>
  <title>Title of the Page</title>
</head>

is a HEAD element (which contains a nested TITLE element)

most HTML elements have opening and closing tags, but not all

```html
<!-- demo1.html    Dave Reed -->  is a COMMENT element

- a comment is ignored by the browser (it does not appear in the rendered page)
- comments are used by the page developer to document page features
Text Layout

Extra white space (spaces, tabs and blank lines) is ignored by the browser

- this allows the browser to adjust the text to the window size

You can control some of the text layout using HTML elements

- a PARAGRAPH element (<p>...<p>) specifies text surrounded by blank lines
- a BREAK element (<br>) causes text to be displayed on a new line
- the &nbsp; symbol forces a space to appear in the text

```html
1. <!doctype html>
2. <!-- demo2.html --> Dave Reed -->
3. <!-- This page demos text spacing and layout. -->
4. <!-- ------------------------------------------------->
5. 
6. <html>
7. <head>
8.  <title> Demo of text layout </title>
9.  </head>
10. 
11. <body>
12.  <p>
13.  Here is a paragraph
14.  that is broken across <br>
15.  two lines.
16.  </p>
17. 
18.  <p>
19.  &nbsp;&nbsp; Here is another paragraph. <br>
20.  This time, the first line is indented two spaces.
21.  </p>
22. </body>
23. </html>
```
in a large document, it is useful to divide the text into sections and then provide each with a heading describing the content that follows

- `<h1> ... </h1>` enclose a top-level heading (large and bold)
- `<h2> ... </h2>` enclose a sub-heading (slightly smaller and bold)
  
  ...

- `<h6> ... </h6>` enclose the smallest sub-heading

the HORIZONTAL-RULE element `<hr>` draws a dividing line in the page

by default, headings and other elements are left-justified in the page

- can change the alignment of an element by adding a `style attribute` that qualifies the appearance of the element

```html
<h1 style="text-align: center">Centered Heading</h1>

<p style="text-align: right">
  This paragraph is right justified. Each line will be shifted to line up at the right margin.
</p>
```
Headings & Alignment (cont.)

the DIV element groups multiple elements, so they can be formatted together

```html
1. <doctype html>
2. <html>
3. <head>
4. <title> Demo of headings </title>
5. </head>
6. <body>
7. <h1> Left-Justified Big Heading </h1>
8. p
9. left-justified text <br>
   and more left-justified text
10. </p>
11. <hr>
12. <h2 style="text-align:center"> Centered Medium Heading </h2>
13. p
14. centered text <br>
   and more centered text
15. </p>
16. <hr>
17. <div style="text-align:right">
18. <h3> Right-Justified Small Heading </h3>
19. p
20. right-justified text <br>
21. and more right-justified text
22. </p>
23. </div>
24. </body>
25. </html>
```
text can be formatted in a variety of ways

- bold (<b> ... </b>), italics (<i> ... </i>), underlined (<u> ... </u>)

colored text is enclosed in <span style="color:????"> ... </span>
- common colors can be used (e.g., red, green, orange, lightblue, darkblue)

```html
1. <!doctype html>
2. <--- demo4.html   Dave Reed -->
3. <--- This page demos font formatting.  -->
4. <--- ---------------------------------- -->
5. 
6. <html>
7. <head>
8. <title> Demo of font formatting </title>
9. </head>
10. 
11. <body>
12.  <p>Here is some <b>bold text</b>.</p>
13.  <p>Here is some <i>italicized text</i>.</p>
14.  <p>Here is some <big>bigger text</big> and <small>smaller text</small>.</p>
15.  <p>Here is some <span style="color:blue">blue text</span>.</p>
16. </body>
17. </html>
```
Hyperlinks

A hyperlink, or just link, is a connection to another Web page
- By default, a link appears as underlined text in the page
- When the user clicks on the link, the corresponding page is retrieved and displayed

A link is specified using anchor tags `<a>` and `</a>`
- Text that appears within the tags is displayed as the link in the page
- Must have an HREF attribute that specifies the associated Web address

```html
<a href="http://www.creighton.edu">Creighton University</a>
<a href="personal.html">Local Page</a>
```

Note: The browser displays links underlined and in color
- By default, links whose pages have not yet been visited are blue
- By default, links whose pages have previously been visited are purple
Hyperlinks (cont.)

1. <!doctype html>
2. <!-- demo5.html
3. Dave Reed -->
4. <!-- This page demos hyperlinks. -->
5. <!-- ================================================== -->
6. <html>
7. <head>
8.   <title>Demo of hyperlinks</title>
9. </head>
10. <body>
11.   <p>
12.     <a href="http://balance3e.com">Home Page for
13.       <i>A Balanced Introduction to Computer Science</i></a></p>
14.   </p>
15.   <p>
16.     Here is a <a href="local.html">local page</a> you might like. <br>
17.     Here it is <a href="local.html" target="_blank">again</a>, but opening in a different window.
18.   </p>
19. </body>
20. </html>

Home Page for A Balanced Introduction to Computer Science

Here is a local page you might like.
Here it is again, but opening in a different window.
Images

Web pages can contain other types of media besides text and links
- images are embedded in a page using an IMG tag ( `<img>` )

IMG attributes
- SRC specifies the location of the image file
- ALT specifies alternate text that is displayed if the image fails to load

```html
1. <!doctype html>
2. <html>  
3. <head>  
4. <title> Demo of images </title>  
5. </head>  
6. <body>  
7. <div style="text-align:center">  
8. <img src="reed.jpg" alt="Dave Reed">  
9. </div>  
10. <p>This is a picture of the author.</p>  
11. </body>  
12. </html>
```
Lists

HTML lists organize items in sequence

- `<ul>`..`</ul>` enclose an unordered list; `<ol>`..`</ol>` enclose an ordered list
- `<li>`..`</li>` enclose a list item

```html
1. <doctype html>
2. <!-- demo7.html     Dave Reed -->
3. <!-- This page demos unordered and ordered lists. -->
4. <!-- ----------- -->
5. 
6. <html>
7. <head>
8.   <title> Demo of lists </title>
9. </head>
10. 
11. <body>
12.   <p> My Hobbies </p>
13.   <ul>
14.     <li> old movies </li>
15.     <li> Celtic music </li>
16.     <li> baseball </li>
17.     <li> hacking around on the computer </li>
18.   </ul>
19. 
20.   <p> My Favorite Movies </p>
21.   <ol>
22.     <li> And Then There Were None </li>
23.     <li> Bringing Up Baby </li>
24.     <li> Crouching Tiger, Hidden Dragon </li>
25.     <li> Big Trouble in Little China </li>
26.     <li> The Usual Suspects </li>
27.   </ol>
28. </body>
29. </html>
```
Lists (cont.)

A style attribute can be used to format the list elements:

```
<ul style="list-style-type:square">  
  <li>Items preceded by squares.</li>
</ul>

<ol style="list-style-type:lower-alpha">  
  <li>Items preceded by lowercase letters (a, b, c, d, ...).</li>
</ol>

<ol style="list-style-type:upper-alpha">  
  <li>Items preceded by uppercase letters (A, B, C, D, ...).</li>
</ol>

<ol style="list-style-type:lower-roman">  
  <li>Items preceded by lowercase roman letters (i, ii, iii, iv, ...).</li>
</ol>

<ol style="list-style-type:upper-roman">  
  <li>Items preceded by uppercase roman letters (I, II, III, ...).</li>
</ol>
```

1. `<!doctype html>`
2. `<--- demo8.html  Dave Reed -->`
3. `<--- This page demos formatted lists. -->`
4. `<--- ------------------------ -->`
5.
6. `<html>`
7. `<head>`
8. `<title> Demo of lists </title>`
9. `</head>`
10.
11. `<body>`
12. `<p> To find the oldest person in a room: </p>`
13.
14. `<ol>`
15.  `<li> Line up all the people along one wall. </li>`
16.  `<li> Ask the first person to state his or her name and birthday, then write this information down on a piece of paper. </li>`
17.  `<li> For each successive person in line: </li>`
18.  `<ol style="list-style-type:lower-alpha">`
19.    `<li> Ask the person his or her name and birthday. </li>`
20.    `<li> If the stated birthday is earlier than the date written on the paper, cross out the old information and write down the name and birthday of this person. </li>`
21.  `</ol>`
22.  `<li> When you have reached the end of the line, the name and birthday of the oldest person will be written on the paper. </li>`
23. `</ol>`
24. `</body>`
25. `</html>`
text can be aligned into rows and columns using a TABLE element

- `<table>` and `</table>` encapsulate the table data
- `<tr>` and `</tr>` encapsulate a row within the table
- `<td>` and `</td>` encapsulate table data within a row (i.e., a column entry)
Tables with Borders

Borders can be added to tables using a style attribute

```html
1. <doctype html>
2. <!-- demo10.html  Dave Reed -->
3. <!-- This page demos a borderless table. -->
4. <!-- ______________________________________ -->
5. 
6. <html>
7. <head>
8. <title> Demo of tables </title>
9. </head>
10. 
11. <body>
12. <table style="border:solid">
13.   <tr><td style="border:solid">Name: </td><td>Chris</td></tr>
14.   <tr><td style="border:solid">Age: </td><td>20</td></tr>
15.   <tr><td style="border:solid">Hometown: </td><td>Chicago</td></tr>
16.   <tr><td style="border:solid">Major: </td><td>Computer Science</td></tr>
17. </table>
18. </body>
19. </html>
```
Tables for Alignment

1. `<doctype html>`
2. `<!-- demo11.html --> Dave Reed -->
3. `<!-- This page demos a table for alignment. -->`
4. `<!-- ============================================================== -->`
5. `<html>`
6. `<head>`
7. `<title> Demo of tables </title>`
8. `</head>`
9. `</head>`
10. `<body>`
11. `<table>`
12. `<tr>`
13. `<td>`<img src="help.jpg" alt="help icon"></td>
14. `<td>`Thanks for visiting my site. <br> Please contact <i>help@dave-reed.com</i> if you have any questions.</td>
15. `</tr>`
16. `</table>`
17. `</body>`
18. `</html>`
19. `</html>`
20. `</html>`

Tables can be used to align elements in the page. Here, an image is aligned to the left of some text.