Chapter 2
HTML and 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 (<>)
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
tags and the text they enclose form an *HTML element*

```
<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)
```
tags and the text they enclose form an *HTML element*

```
<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

```
<!-- 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
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
Headings & Alignment

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>
```
the DIV element groups multiple elements, so they can be formatted together
Font Formatting

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

```
1. <!doctype html>
2. <!-- demo6.html
3. <!-- This page demos images. -->
4. <!-- ---------------------------------- -->
5. 
6. <html>
7. <head>
8.  <title> Demo of images </title>
9.  </head>
10. 
11. <body>
12.  <div style="text-align:center">
13.   <img src="reed.jpg" alt="Dave Reed">
14. 
15.  </div>
16.   <p>This is a picture of the author.</p>
17. </body>
18. </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
Lists (cont.)

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

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

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

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

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

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

To find the oldest person in a room:

1. Line up all the people along one wall.
2. Ask the first person to state his or her name and birthday, then write this information down on a piece of paper.
3. For each successive person in line:
   a. Ask the person his or her name and birthday.
   b. 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.
4. When you have reached the end of the line, the name and birthday of the oldest person will be written on the paper.
Tables

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)

```html
1. <!doctype html>
2. <!-- demo9.html
3. <!-- This page demos a borderless table. -->
4. <!-- ------------------------------------------------ -->
5. 6. <html>
6. 7. <head>
7. 8.   <title> Demo of tables </title>
8. 9. </head>
10. 11. <body>
12. 13. <table>
13. 14.   <tr> <td> Name: </td> <td> Chris </td> </tr>
14. 15.   <tr> <td> Age: </td> <td> 20 </td> </tr>
15. 16.   <tr> <td> Hometown: </td> <td> Chicago </td> </tr>
16. 17.   <tr> <td> Major: </td> <td> Computer Science </td> </tr>
17. </table>
18. </body>
19. </html>
```
Tables with Borders

borders can be added to tables using a style attribute

- `style="border:solid"` adds a border to the table or table data items

```
1. <!doctype html>
2. <html>  
3. <head>  
4.  
5. </head>  
6. <body>  
7.  
8. <table style="border:solid">  
9.   <tr> <td style="border:solid"> Name: </td> 
10.  <td style="border:solid"> Chris </td> </tr>  
11.  <tr> <td style="border:solid"> Age: </td> 
12.  <td style="border:solid"> 20 </td> </tr>  
13.  
14.  
15.  
16.  
17.  
18.  
19.  
20.  
21. </table>  
22. </body>  
23. </html>
```
Tables for Alignment

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

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