

# Introduction to HTML5 Part 1

## 2.1 Introduction

- HyperText Markup Language 5 (HTML5)
  - A markup language that specifies the structure and content of documents that are displayed in web browsers
- We introduce some basics, then cover more sophisticated HTML5 techniques
  - Tables
    - Particularly useful for structuring information from databases
  - Forms
    - Collecting information from web-page visitors
  - Internal linking
    - Easier page navigation
  - Meta elements
    - Specifying information about a document

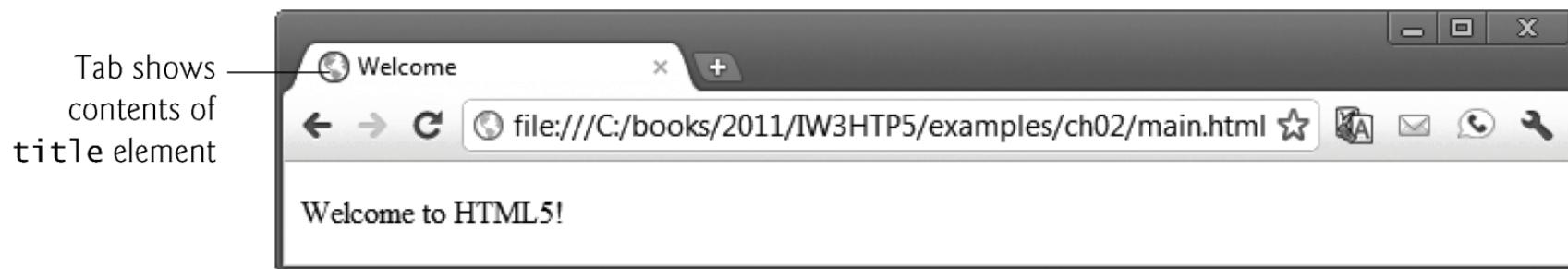
## 2.2 Editing HTML5

- We'll create HTML5 documents by typing HTML5 markup text in a text editor
  - Notepad,TextEdit, vi, emacs
  - Saving it with the .html or .htm filename extension.
- Computers called web servers store HTML5 documents
- Clients (such as web browsers running on your local computer or smartphone) request specific resources such as HTML5 documents from web servers

## 2.3 First HTML5 Example

- Figure 2.1 is an HTML5 document named main.html, which is stored in the examples/ch02 folder
- This first example displays the message Welcome to HTML5! in the browser
  - main.html

```
1 <!DOCTYPE html>
2
3 <!-- Fig. 2.1: main.html -->
4 <!-- First HTML5 example. -->
5 <html>
6   <head>
7     <meta charset = "utf-8">
8     <title>Welcome</title>
9   </head>
10
11  <body>
12    <p>Welcome to HTML5!</p>
13  </body>
14 </html>
```



**Fig. 2.1** | First HTML5 example.

## 2.3 First HTML5 Example

- The document type declaration (DOCTYPE) is required in HTML5 documents so that browsers render the page in standards mode
- Some browsers operate in quirks mode to maintain backward compatibility with web pages that are not up-to-date with the latest standards
- We include blank lines (lines 2 and 10) to make our documents easier to read
  - The browser ignores them

## 2.3 First HTML5 Example

- Comments
  - Insert comments in your HTML5 markup to improve readability and describe the content of a document
  - The browser ignores comments when your document is rendered
  - Comments start with <!-- and end with -->

## 2.3 First HTML5 Example

- HTML5 markup contains text (and images, graphics, animations, audios and videos)
  - Represent the content of a document and elements that specify a document's structure and meaning
    - The `html` element encloses the head section and the body section
- The **head** section contains information about the HTML5 document
  - The character set (UTF-8) that the page use
  - The title
  - [http://www.w3schools.com/tags/tag\\_head.asp](http://www.w3schools.com/tags/tag_head.asp)

## 2.3 First HTML5 Example

- The **head** section also can contain special document-formatting instructions for creating dynamic web pages
  - CSS3 style sheets
  - Client-side programs called scripts
- The **body** section contains the page's content, which the browser displays when the user visits the web page

## 2.3 First HTML5 Example (cont.)

- HTML5 documents delimit most elements with a start tag and end tag
- A start tag consists of the element name in angle brackets
  - `<html>`
- An end tag consists of the element name preceded by a forward slash (/) in angle brackets
  - `</html>`
- There are several so-called “void elements” that do not have end tags

## 2.3 First HTML5 Example (cont.)

- Many start tags have attributes that provide additional information about an element, which browsers use to determine how to process the element
- Each attribute has a name and a value separated by an equals sign (=)
  - **<meta charset="UTF-8">**
  - [http://www.w3schools.com/tags/tag\\_meta.asp](http://www.w3schools.com/tags/tag_meta.asp)



### Good Programming Practice 2.1

Although HTML5 element and attribute names are case insensitive (you can use uppercase and lowercase letters), it's a good practice to use only lowercase letters.

## 2.3 First HTML5 Example (Cont.)

- The title element is called a nested element, because it's enclosed in the head element's start and end tags
  - <title>Welcome</title>
  - The head element is also a nested element, because it's enclosed in the html element's start and end tags
- The **title** element describes the web page
  - Titles usually appear in the title bar at the top of the browser window, in the browser tab on which the page is displayed
  - Also as the text identifying a page when users add the page to their list of Favorites or Bookmarks
  - Search engines use the title for indexing purposes and when displaying results



## **Good Programming Practice 2.2**

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Indenting nested elements emphasizes a document's structure and promotes readability. We use three spaces for each level of indentation.

## 2.3 First HTML5 Example (Cont.)

- Paragraph Element (<p>...</p>)
- All text placed between the <p> and </p> tags forms one paragraph
- When a browser renders a paragraph, it places extra space above and below the paragraph text
- <p>Welcome to HTML5!</p>
  - Tell the browser to display Welcome to HTML5!

## 2.4 W3C HTML5 Validation Service

- HTML5 documents that are syntactically correct are guaranteed to render properly
- HTML5 documents that contain syntax errors may not display properly
- Validation services
  - <http://validator.w3.org/#validate-by-upload>
  - Ensure that an HTML5 document is syntactically correct



### Error-Prevention Tip 2.1

Most browsers attempt to render HTML5 documents even if they're invalid. This can lead to unexpected and undesirable results. Use a validation service, such as the W3C *MarkUp Validation Service*, to confirm that an HTML5 document is syntactically correct.

## 2.5 Headings

- HTML5 provides six heading elements (**h1** through **h6**) for specifying the relative importance of information
  - [http://www.w3schools.com/tags/tag\\_hn.asp](http://www.w3schools.com/tags/tag_hn.asp)
  - Heading element **h1** is considered the most significant heading and is rendered in the largest font
  - Each successive heading element (i.e., **h2**, **h3**, etc.) is rendered in a progressively smaller font



## **Portability Tip 2.1**

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The text size used to display each heading element can vary between browsers. In Chapter 4, we use CSS to control the text size and other text properties.



## **Look-and-Feel Observation 2.1**

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Placing a heading at the top of each page helps viewers understand the purpose of the page. Headers also help create an outline for a document and are indexed by search engines.

```
1  <!DOCTYPE html>
2
3  <!-- Fig. 2.2: heading.html -->
4  <!-- Heading elements h1 through h6. -->
5  <html>
6      <head>
7          <meta charset = "utf-8">
8          <title>Headings</title>
9      </head>
10
11     <body>
12         <h1>Level 1 Heading</h1>
13         <h2>Level 2 heading</h2>
14         <h3>Level 3 heading</h3>
15         <h4>Level 4 heading</h4>
16         <h5>Level 5 heading</h5>
17         <h6>Level 6 heading</h6>
18     </body>
19 </html>
```

**Fig. 2.2** | Heading elements h1 through h6. (Part 1 of 2.)

## 2.6 Linking

- A hyperlink references or links to other resources, such as HTML5 documents and images
- Web browsers typically underline text hyperlinks and color them blue by default
- The `strong` element indicates that the content has high importance
- Browsers typically render such text in a bold font
  - `<p><strong>Click a name to visit that site.</strong></p>`

```
1  <!DOCTYPE html>
2
3  <!-- Fig. 2.3: links.html -->
4  <!-- Linking to other web pages. -->
5  <html>
6      <head>
7          <meta charset = "utf-8">
8          <title>Links</title>
9      </head>
10
11     <body>
12         <h1>Here are my favorite sites:</h1>
13         <p><strong>Click a name to visit that site.</strong></p>
14
15         <!-- create four text hyperlinks -->
16         <p><a href = "http://www.facebook.com">Facebook</a></p>
17         <p><a href = "http://www.twitter.com">Twitter</a></p>
18         <p><a href = "http://www.foursquare.com">Foursquare</a></p>
19         <p><a href = "http://www.google.com">Google</a></p>
20     </body>
21 </html>
```

**Fig. 2.3 |** Linking to other web pages. (Part I of 2.)

## 2.6 Linking (Cont.)

- Links are created using the **a** (anchor) element
  - [http://www.w3schools.com/tags/tag\\_a.asp](http://www.w3schools.com/tags/tag_a.asp)
- Attribute **href** (hypertext reference) specifies a resource's location
  - A web page or location within a web page
    - <a href = "http://www.facebook.com">Facebook</a>
  - A file
  - An e-mail address
- When a URL does not indicate a specific document on the website, the web server returns a default web page

- This page is often called index.html, but most web servers can be configured to use any file as the default web page for the site
- If the web server cannot locate a requested document, it returns an error indication to the web browser (known as a 404 error)
  - The browser displays a web page containing an error message



### **Software Engineering Observation 2.1**

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Although not required in HTML5, enclosing attribute values in either single or double quotes is recommended.

## 2.6 Linking (Cont.)

- Hyperlinking to an E-Mail Address
  - Anchors can link to an e-mail address using a **mailto: URL**
    - When a user clicks this type of anchored link, most browsers launch the default e-mail program (e.g., Mozilla Thunderbird, Microsoft Outlook or Apple Mail) to enable the user to write an e-mail message to the linked address

```
1  <!DOCTYPE html>
2
3  <!-- Fig. 2.4: contact.html -->
4  <!-- Linking to an e-mail address. -->
5  <html>
6      <head>
7          <meta charset = "utf-8">
8          <title>Contact Page</title>
9      </head>
10
11     <body>
12         <p>
13             To write to <a href = "mailto:deitel@deitel.com">
14                 Deitel & Associates, Inc.</a>, click the link and your default
15                 email client will open an email message and address it to us.
16         </p>
17     </body>
18 </html>
```

**Fig. 2.4** | Linking to an e-mail address. (Part I of 3.)

## 2.7 Images

- The most popular image formats used by web developers today are
  - Portable Network Graphics (PNG)
  - Joint Photographic Experts Group (JPEG)
- Users can create images using specialized software, such as Adobe Photoshop Express ([www.photoshop.com](http://www.photoshop.com)), G.I.M.P. ([www.gimp.org](http://www.gimp.org)), Inkscape ([www.inkscape.org](http://www.inkscape.org)) and many more
- Images may also be acquired from various websites, many of which offer royalty-free images

<b>Image-sharing site</b>	<b>URL</b>
Flickr®	<a href="http://www.flickr.com">www.flickr.com</a>
Photobucket	<a href="http://photobucket.com">photobucket.com</a>
Fotki™	<a href="http://www.fotki.com">www.fotki.com</a>
deviantART	<a href="http://www.deviantart.com">www.deviantart.com</a>
Picasa™	<a href="http://picasa.google.com">picasa.google.com</a>
TinyPic®	<a href="http://tinypic.com">tinypic.com</a>
ImageShack	<a href="http://www.imageshack.us">www.imageshack.us</a>
FreeDigitalPhotos.net	<a href="http://www.freedigitalphotos.net">www.freedigitalphotos.net</a>
Open Stock Photography	<a href="http://www.openstockphotography.org">www.openstockphotography.org</a>
Open Clip Art Library	<a href="http://www.openclipart.org">www.openclipart.org</a>

**Fig. 2.5 | Popular image-sharing sites.**

```
1 <!DOCTYPE html>
2
3 <!-- Fig. 2.6: picture.html -->
4 <!-- Including images in HTML5 files. -->
5 <html>
6   <head>
7     <meta charset = "utf-8">
8     <title>Images</title>
9   </head>
10
11  <body>
12    <p>
13      <img src = "cpphttp.png" width = "92" height = "120"
14          alt = "C++ How to Program book cover">
15      <img src = "jhttp.png" width = "92" height = "120"
16          alt = "Java How to Program book cover">
17    </p>
18  </body>
19 </html>
```

**Fig. 2.6** | Including images in HTML5 files. (Part I of 2.)

## 2.7 Images (cont.)

- The **img** element's src attribute specifies an image's location
- **<img src = "cpphttp.png" width = "92" height = "120" alt = "C++ How to Program book cover">**
- Every **img** element must have an alt attribute, which contains text that is displayed if the client cannot render the image
  - The **alt** attribute makes web pages more accessible to users with disabilities, especially vision impairments
  - **width** and **height** are optional attributes
    - If omitted, the browser uses the image's actual width and height
    - Images are measured in pixels



## Performance Tip 2.1

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Always include the `width` and the `height` of an image in the `<img>` tag so that when the browser loads the HTML5 file, it will know how much screen space to provide and can lay out the page properly, even before it downloads the image. Including the `width` and `height` attributes in an `<img>` tag can help the browser load and render pages faster.



## Look-and-Feel Observation 2.2

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Entering new dimensions for an image that change its width-to-height ratio distorts the appearance of the image. To avoid distortion, if your image is 200 pixels wide and 100 pixels high, for example, any new dimensions should maintain the 2:1 width-to-height ratio.

## 2.7 Images (Cont.)

- A browser may not be able to render an image
- Every **img** element in an HTML5 document must have an **alt** attribute
- If a browser cannot render an image, the browser displays the **alt** attribute's value
- The **alt** attribute is also important for accessibility
  - Speech synthesizer software can speak the **alt** attribute's value so that a visually impaired user can understand what the browser is displaying
  - For this reason, the **alt** attribute should describe the image's contents

## 2.7 Images (Cont.)

- Void Elements
  - Contain only attributes and do not mark up text
  - Text is not placed between a start and an end tag
- You can terminate void elements (such as the img element) by using the forward slash character (/) inside the closing right angle bracket (>) of the start tag
- For example, lines 15–16 of Fig. 2.6 could be written as follows
  - **<img src = "jhtp.png" width = "92" height = "120" alt = "Java How to Program book cover" />**

## 2.7 Images (Cont.)

- By using images as hyperlinks, you can create graphical web pages that link to other resources
- Clicking an image in this example takes the user to a corresponding web page
  - One of the other examples in this chapter
- [http://www.w3schools.com/tags/tag\\_img.asp](http://www.w3schools.com/tags/tag_img.asp)

```
1  <!DOCTYPE html>
2
3  <!-- Fig. 2.7: nav.html -->
4  <!-- Images as link anchors. -->
5  <html>
6      <head>
7          <meta charset = "utf-8">
8          <title>Navigation Bar</title>
9      </head>
10
11     <body>
12         <p>
13             <a href = "links.html">
14                 <img src = "buttons/links.jpg" width = "65"
15                     height = "50" alt = "Links">
16             </a>
17
18             <a href = "list.html">
19                 <img src = "buttons/list.jpg" width = "65"
20                     height = "50" alt = "List of Features">
21             </a>
22
```

**Fig. 2.7 |** Images as link anchors. (Part I of 3.)

```
23      <a href = "contact.html">
24          <img src = "buttons/contact.jpg" width = "65"
25              height = "50" alt = "Contact Me">
26      </a>
27
28      <a href = "table1.html">
29          <img src = "buttons/table.jpg" width = "65"
30              height = "50" alt = "Tables Page">
31      </a>
32
33      <a href = "form.html">
34          <img src = "buttons/form.jpg" width = "65"
35              height = "50" alt = "Feedback Form">
36      </a>
37  </p>
38  </body>
39 </html>
```

**Fig. 2.7 |** Images as link anchors. (Part 2 of 3.)

## 2.8 Special Characters and Horizontal Rules

- HTML5 provides character entity references (in the form &code) for representing special characters that cannot be rendered otherwise
- The code can be
  - Word abbreviations
  - Numbers
    - Decimal
    - Hexadecimal

<b>Symbol</b>	<b>Description</b>	<b>Character entity reference</b>
HTML5 character entities		
&	ampersand	&amp;
,	apostrophe	&ampapos
>	greater-than	&gt;
<	less-than	&lt;
"	quote	&quot;
Other common character entities		
non-breaking space		&ampnbsp
©	copyright	&copy;
—	em dash	&mdash;
–	en dash	&ndash;
¼	fraction 1/4	&frac14;
½	fraction 1/2	&frac12;

**Fig. 2.8 |** Some common HTML character entity references.

Symbol	Description	Character entity reference
$\frac{3}{4}$	fraction 3/4	&frac34;
...	horizontal ellipsis	&hellip;
®	registered trademark	&reg;
§	section	&sect;
™	trademark	&trade;

**Fig. 2.8 |** Some common HTML character entity references.

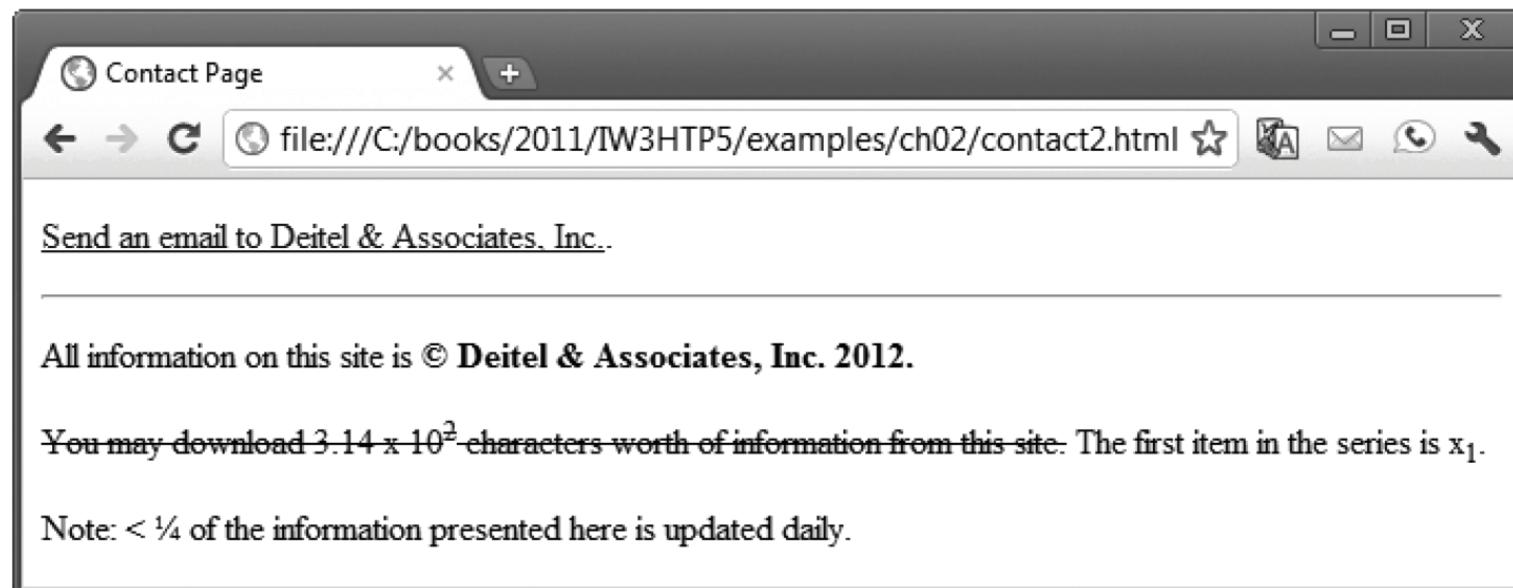
## 2.8 Special Characters and Horizontal Rules (Cont.)

- Figure 2.9 demonstrates how to use special characters in an HTML5 document
- For an extensive list of character entities, see
  - <http://www.w3.org/TR/REC-html40/sgml/entities.html>

```
1  <!DOCTYPE html>
2
3  <!-- Fig. 2.9: contact2.html -->
4  <!-- Inserting special characters. -->
5  <html>
6      <head>
7          <meta charset = "utf-8">
8          <title>Contact Page</title>
9      </head>
10
11     <body>
12         <p>
13             <a href = "mailto:deitel@deitel.com">Send an email to
14                 Deitel & Associates, Inc.</a>.
15         </p>
16
17         <hr> <!-- inserts a horizontal rule -->
18
19         <!-- special characters are entered -->
20         <!-- using the form &code; -->
21         <p>All information on this site is <strong>&copy;
22             Deitel & Associates, Inc. 2012.</strong> </p>
23
24         <!-- to strike through text use <del> element -->
```

**Fig. 2.9** | Inserting special characters. (Part 1 of 2.)

```
25      <!-- to subscript text use <sub> element -->
26      <!-- to superscript text use <sup> element -->
27      <!-- these elements are nested inside other elements -->
28      <p><del>You may download  $3.14 \times 10^2$ </sup></del>
29          characters worth of information from this site.</del>
30          The first item in the series is  $x_1$ .</p>
31      <p>Note: <math>\frac{1}{4}</math> of the information
32          presented here is updated daily.</p>
33  </body>
34 </html>
```



**Fig. 2.9 | Inserting special characters. (Part 2 of 2.)**

## 2.8 Special Characters and Horizontal Rules (Cont.)

- A horizontal rule, indicated by the **<hr>** tag renders a horizontal line with extra space above and below it in most browsers
  - **<hr> <!-- inserts a horizontal rule -->**
- The horizontal rule element should be considered a legacy element and you should avoid using it
  - CSS can be used to add horizontal rules and other formatting to documents

## 2.8 Special Characters and Horizontal Rules (Cont.)

- Special characters can also be represented as numeric character references
  - Decimal or hexadecimal (hex) values representing special characters
  - For example, the & character is represented in decimal and hexadecimal notation as **&#38;** and **&#x26;**, respectively
    - You have learned in Introduction to Computer Science

## 2.9 Lists

- Unordered list element **ul**
  - Creates a list in which each item in the list begins with a bullet symbol (typically a disc)
    - [http://www.w3schools.com/tags/tag\\_ul.asp](http://www.w3schools.com/tags/tag_ul.asp)
  - Each entry is an **li** (list item) element
    - [http://www.w3schools.com/tags/tag\\_li.asp](http://www.w3schools.com/tags/tag_li.asp)
    - Most web browsers render these elements with a line break and a bullet symbol at the beginning of the line

```
1 <!DOCTYPE html>
2
3 <!-- Fig. 2.10: links2.html -->
4 <!-- Unordered list containing hyperlinks. -->
5 <html>
6   <head>
7     <meta charset = "utf-8">
8     <title>Links</title>
9   </head>
10
11 <body>
12   <h1>Here are my favorite sites</h1>
13   <p><strong>Click on a name to go to that page</strong></p>
14
15   <!-- create an unordered list -->
16   <ul>
17     <!-- the list contains four list items -->
18     <li><a href = "http://www.youtube.com">YouTube</a></li>
19     <li><a href = "http://www.wikipedia.org">Wikipedia</a></li>
20     <li><a href = "http://www.amazon.com">Amazon</a></li>
21     <li><a href = "http://www.linkedin.com">LinkedIn</a></li>
22   </ul>
23 </body>
24 </html>
```

**Fig. 2.10** | Unordered list containing hyperlinks. (Part I of 2.)

## 2.9 Lists (Cont.)

- Nested lists
  - Lists may be nested to represent hierarchical relationships, as in a multi-level outline
  - The ordered-list element ol creates a list in which each item begins with a number
  - [http://www.w3schools.com/tags/tag\\_ol.asp](http://www.w3schools.com/tags/tag_ol.asp)

```
1 <!DOCTYPE html>
2
3 <!-- Fig. 2.11: list.html -->
4 <!-- Nested lists and ordered lists. -->
5 <html>
6   <head>
7     <meta charset = "utf-8">
8     <title>Lists</title>
9   </head>
10
11  <body>
12    <h1>The Best Features of the Internet</h1>
13
```

**Fig. 2.11 |** Nested lists and ordered lists. (Part 1 of 4.)

---

```
14      <!-- create an unordered list -->
15      <ul>
16          <li>You can meet new people from countries around
17              the world.</li>
18          <li>
19              You have access to new media as it becomes public:
20
21          <!-- this starts a nested unordered list, which uses a -->
22          <!-- different bullet. The list ends when you -->
23          <!-- close the <ul> tag. -->
24          <ul>
25              <li>New games</li>
26              <li>New applications
27
28          <!-- nested ordered list -->
29          <ol>
30              <li>For business</li>
31              <li>For pleasure</li>
32          </ol>
33      </li> <!-- ends line 27 new applications li-->
34
35          <li>Around the clock news</li>
36          <li>Search engines</li>
37          <li>Shopping</li>
```

Fig. 2.11 | Nested lists and ordered lists. (Part 2 of 4.)

```
38      <li>Programming
39
40          <!-- another nested ordered list -->
41          <ol>
42              <li>XML</li>
43              <li>Java</li>
44              <li>HTML5</li>
45              <li>JavaScript</li>
46              <li>New Languages</li>
47          </ol>
48      </li> <!-- ends programming li of line 38 -->
49      </ul> <!-- ends the nested list of line 24 -->
50  </li>
51
52      <li>Links</li>
53      <li>Keeping in touch with old friends</li>
54      <li>It's the technology of the future!</li>
55  </ul> <!-- ends the unordered list of line 15 -->
56  </body>
57 </html>
```

**Fig. 2.11** | Nested lists and ordered lists. (Part 3 of 4.)

## 2.10 Tables

- Tables are frequently used to organize data into rows and columns
  - The table element defines an HTML5 table
- The summary attribute summarizes the table's contents and is used by speech devices to make the table more accessible to users with visual impairments
- The caption element specifies a table's title
- It's good practice to include a general description of a table's information in the table element's summary attribute
  - One of the many HTML5 features that make web pages more accessible to users with disabilities
  - Speech devices use this attribute to make the table more accessible to users with visual impairments

```
1  <!DOCTYPE html>
2
3  <!-- Fig. 2.12: table1.html -->
4  <!-- Creating a basic table. -->
5  <html>
6      <head>
7          <meta charset = "utf-8">
8          <title>A simple HTML5 table</title>
9      </head>
10
11     <body>
12         <!-- the <table> tag opens a table -->
13         <table border = "1">
14
15             <!-- the <caption> tag summarizes the table's -->
16             <!-- contents (this helps visually impaired people) -->
17             <caption><strong>Table of Fruits (1st column) and
18                 Their Prices (2nd column)</strong></caption>
19
```

**Fig. 2.12 |** Creating a basic table. (Part 1 of 4.)

```
20      <!-- the <thead> section appears first in the table -->
21      <!-- it formats the table header area -->
22      <thead>
23          <tr> <!-- <tr> inserts a table row -->
24              <th>Fruit</th> <!-- insert a heading cell -->
25              <th>Price</th>
26          </tr>
27      </thead>
28
29      <!-- the <tfoot> section appears last in the table -->
30      <!-- it formats the table footer -->
31      <tfoot>
32          <tr>
33              <th>Total</th>
34              <th>$3.75</th>
35          </tr>
36      </tfoot>
37
38      <!-- all table content is enclosed -->
39      <!-- within the <tbody> -->
40      <tbody>
41          <tr>
42              <td>Apple</td> <!-- insert a data cell -->
43              <td>$0.25</td>
44          </tr>
```

**Fig. 2.12** | Creating a basic table. (Part 2 of 4.)

```
45          <tr>
46              <td>Orange</td>
47              <td>$0.50</td>
48      </tr>
49      <tr>
50          <td>Banana</td>
51          <td>$1.00</td>
52      </tr>
53      <tr>
54          <td>Pineapple</td>
55          <td>$2.00</td>
56      </tr>
57  </tbody>
58 </table>
59 </body>
60 </html>
```

**Fig. 2.12** | Creating a basic table. (Part 3 of 4.)

## 2.10 Tables (Cont.)

- A table can be split into three distinct sections
  - Head (**thead** element)
    - Table titles
    - Column headers
    - [http://www.w3schools.com/tags/tag\\_thead.asp](http://www.w3schools.com/tags/tag_thead.asp)
  - Body (**tbody** element)
    - Primary table data
    - [http://www.w3schools.com/tags/tag\\_tbody.asp](http://www.w3schools.com/tags/tag_tbody.asp)
  - Table Foot (**tfoot** element)
    - Calculation results
    - Footnotes
    - Above body section in the code, but displays at the bottom in the page
    - [http://www.w3schools.com/tags/tag\\_tfoot.asp](http://www.w3schools.com/tags/tag_tfoot.asp)

## 2.10 Tables (Cont.)

- **tr** Element
  - Defines individual table rows
  - [http://www.w3schools.com/tags/tag\\_tbody.asp](http://www.w3schools.com/tags/tag_tbody.asp)
- **th** Element
  - Defines a header cell
  - [http://www.w3schools.com/tags/tag\\_th.asp](http://www.w3schools.com/tags/tag_th.asp)
- **td** Element
  - Contains table data elements
  - [http://www.w3schools.com/tags/tag\\_td.asp](http://www.w3schools.com/tags/tag_td.asp)

## 2.10 Tables (Cont.)

- Using **rowspan** and **colspan** with Tables
  - You can merge data cells with the **rowspan** and **colspan** attributes
    - The values of these attributes specify the number of rows or columns occupied by the cell
    - Can be placed inside any data cell or table header cell
  - The **br** element is rendered as a line break in most browsers
    - Any markup or text following a **br** element is rendered on the next line
    - Like the **img** element, **br** is an example of a void element
    - **br** is considered a legacy formatting element that you should avoid using
      - In general, formatting should be specified using CSS

```
1  <!DOCTYPE html>
2
3  <!-- Fig. 2.13: table2.html -->
4  <!-- Complex HTML5 table. -->
5  <html>
6      <head>
7          <meta charset = "utf-8">
8          <title>Tables</title>
9      </head>
10
11     <body>
12         <h1>Table Example: Spanning Rows and Columns</h1>
13
14         <table border = "1">
15             <caption>A more complex sample table</caption>
16
```

**Fig. 2.13 |** Complex HTML5 table. (Part 1 of 4.)

```
17 <thead>
18     <!-- rowspans and colspans merge the specified -->
19     <!-- number of cells vertically or horizontally -->
20     <tr>
21         <!-- merge two rows -->
22         <th rowspan = "2">
23             <img src = "camel.png" width = "205"
24                 height = "167" alt = "Picture of a camel">
25         </th>
26
27         <!-- merge four columns -->
28         <th colspan = "4">
29             <strong>Camelid comparison</strong><br>
30             Approximate as of 10/2011
31         </th>
32     </tr>
33     <tr>
34         <th># of humps</th>
35         <th>Indigenous region</th>
36         <th>Spits?</th>
37         <th>Produces wool?</th>
38     </tr>
39 </thead>
```

**Fig. 2.13** | Complex HTML5 table. (Part 2 of 4.)

```
40      <tbody>
41          <tr>
42              <th>Camels (bactrian)</th>
43              <td>2</td>
44              <td>Africa/Asia</td>
45              <td>Yes</td>
46              <td>Yes</td>
47          </tr>
48          <tr>
49              <th>Llamas</th>
50              <td>1</td>
51              <td>Andes Mountains</td>
52              <td>Yes</td>
53              <td>Yes</td>
54          </tr>
55      </tbody>
56  </table>
57  </body>
58 </html>
```

**Fig. 2.13** | Complex HTML5 table. (Part 3 of 4.)

[http://www.w3schools.com/html/html\\_tables.asp](http://www.w3schools.com/html/html_tables.asp)

## 2.11 Forms

- HTML5 provides forms for collecting information from users
  - [http://www.w3schools.com/tags/tag\\_form.asp](http://www.w3schools.com/tags/tag_form.asp)
  - [http://www.w3schools.com/tags/tag\\_input.asp](http://www.w3schools.com/tags/tag_input.asp)

```
1  <!DOCTYPE html>
2
3  <!-- Fig. 2.14: form.html -->
4  <!-- Form with a text field and hidden fields. -->
5  <html>
6      <head>
7          <meta charset = "utf-8">
8          <title>Forms</title>
9      </head>
10
11     <body>
12         <h1>Feedback Form</h1>
13
14         <p>Please fill out this form to help
15             us improve our site.</p>
16
17         <!-- this tag starts the the form, gives the -->
18         <!-- method of sending information and the -->
19         <!-- location of the form-processing script -->
20         <form method = "post" action = "http://www.deitel.com">
21             <!-- hidden inputs contain non-visual -->
22             <!-- information that will also be submitted -->
23             <input type = "hidden" name = "recipient"
24                 value = "deitel@deitel.com">
```

**Fig. 2.14** | Form with a text field and hidden fields. (Part I of 3.)

```
25      <input type = "hidden" name = "subject"
26          value = "Feedback Form">
27      <input type = "hidden" name = "redirect"
28          value = "main.html">
29
30      <!-- <input type = "text"> inserts a text field -->
31      <p><label>Name:
32          <input name = "name" type = "text" size = "25"
33              maxLength = "30">
34      </label></p>
35
36      <p>
37          <!-- input types "submit" and "reset" insert -->
38          <!-- buttons for submitting and clearing the -->
39          <!-- form's contents, respectively -->
40          <input type = "submit" value = "Submit">
41          <input type = "reset" value = "Clear">
42      </p>
43      </form>
44  </body>
45 </html>
```

**Fig. 2.14** | Form with a text field and hidden fields. (Part 2 of 3.)

## 2.11 Forms (Cont.)

- A form is defined by a form element
  - Attribute method specifies how the form's data is sent to the web server
  - Using **method = "post"**
    - Append form data to the browser request, which contains the protocol (HTTP) and the requested resource's URL
  - The other possible value, **method = "get"**
    - Appends the form data directly to the end of the URL of the script, where it's **visible** in the browser's Address field

## 2.11 Forms (Cont.)

- The action attribute of the form element specifies the script to which the form data will be sent
- Since we haven't introduced server-side programming yet, we set this attribute to `http://www.deitel.com` for now
- **input** elements that specify data to provide to the script that processes the form (also called the form handler)
  - An input's type is determined by its type attribute

## 2.11 Forms (Cont.)

- Forms can contain visual and nonvisual components
  - Visual components include
    - Clickable buttons
    - Other graphical user interface components with which users interact
  - Nonvisual components, called hidden inputs
    - Store any data that you specify, such as e-mail addresses and HTML5 document file names that act as links
- The text input inserts a text field into the form, which allows the user to input data
  - The **label** element provides users with information about the input element's purpose
  - The **size** attribute specifies the number of characters visible in the text field

## 2.11 Forms (Cont.)

- Optional attribute **maxlength** limits the number of characters input into a text field
- The **submit input** element is a button
  - When the submit button is pressed, the form's data is sent to the location specified in the form's action attribute
- The **value** attribute sets the text displayed on the button
- The **reset input** element allows a user to reset all form elements to their default values

## 2.11 Forms (Cont.)

- The **textarea** element inserts a multiline text area into the form
  - The number of rows is specified with the **rows** attribute, and the number of columns (i.e., characters per line) with the **cols** attribute
  - Default text can be specified in other input types, such as text fields, by using the **value** attribute

## 2.11 Forms (Cont.)

- The **password input** inserts a password box into a form
  - Allows users to enter sensitive information, such as credit card numbers and passwords, by “masking” the information input with another character, usually asterisks
  - The actual value input is sent to the web server, not the asterisks that mask the input

## 2.11 Forms (Cont.)

- The **checkbox input** element enables users to select
  - When the checkbox is selected, a check mark appears in the checkbox
  - Checkboxes can be used individually and in groups
  - Checkboxes that are part of the same group have the same name
- **radio buttons** are similar to checkboxes, except that only one radio button in a group can be selected at any time
  - All radio buttons in a group have the same name attribute but different value attributes
- The select input provides a drop-down list of items
  - The name attribute identifies the drop-down list
  - The option element adds items to the drop-down list



## Common Programming Error 2.1

---

When your form has several `checkbox`s with the same name, make sure that they have different values, or the web server scripts will not be able to distinguish them.



## Common Programming Error 2.2

---

Not setting the `name` attributes of the `radio` buttons in a group to the same name is a logic error because it lets the user select all of the `radio` buttons at the same time.

## 2.12 Internal Linking

- The **a** tag can be used to link to another section of the same document by specifying the element's id as the link's **href**
- To link internally to an element with its id attribute set, use the syntax #id
  - internal.html

## 2.13 meta Elements

- One way that search engines catalog pages is by reading the **meta** element's contents
  - The **name** attribute identifies the type of **meta** element
  - The **content** attribute
    - Of a keywords meta element
      - Provide search engines with a list of words that describe a page, which are compared with words in search requests
    - Of a description meta element
      - Provide a three- to four-line description of a site in sentence form, used by search engines to catalog your site
      - This text is sometimes displayed as part of the search result
  - **meta.html**



## **Software Engineering Observation 2.2**

---

meta elements are not visible to users. They must be placed inside the head section of your HTML5 document; otherwise they will not be read by search engines.