Chapter 12
Web Forms, HTML, and ASP.NET

Objectives
In this chapter, you will:
• Review Internet and Web fundamentals
• Review HTML basics
• Use HTML forms
• Use ASP.NET to develop Web pages
• Create an ASP.NET Web application
• Create an ASP.NET survey application

Introduction
• Internet
  – An interconnected system of networks that links computers worldwide
  – Protocol used:
    • Transmission Control Protocol/Internet Protocol (TCP/IP)

Understanding Internet and Web Fundamentals
• The Web is based on a client-server architecture
  – A form of distributed computing in which software is split between
    • Server tasks
    • Client tasks
• Uniform Resource Locator (URL)
  – Used to identify and access a Web server
  – Generally called a Web address

Introduction
• World Wide Web (or the Web)
  – Largest and perhaps most important segment of the Internet
  – Has graphics and animation capabilities
  – Protocol used to process information:
    • Hypertext Transmission Protocol (HTTP)
  – Language used to present information:
    • Hypertext Markup Language (HTML)
• Web browser
  – Uses HTML to render Web information for a particular display device

Understanding Internet and Web Fundamentals
• A Web page
  – A file with an .htm or .html extension
  – Contains HTML; might also contain other code
  – Stored on a server
Static and Dynamic Web Pages

- Static Web pages
  - Contain HTML tags only
  - Simply display information
  - Content does not change when requested by the user

- Dynamic Web pages
  - Content changes depending on the user’s request or preferences
  - Cannot be created using HTML alone

- Server-side technologies for providing dynamic content
  - ASP
  - ASP.NET
  - Common Gateway Interface (CGI)
  - Java Server Pages (JSP)
  - ColdFusion
  - Personal Hypertext Preprocessor (PHP)

- Classic ASP
  - Allows creation of dynamic Web pages through:
    - Embedding of program scripts in HTML
      - Scripts are created using scripting languages, such as:
        » VBScript
        » JavaScript
      - Now being supplanted by ASP.NET

Setting Up an IIS Server

- Internet Information Services (IIS)
  - A Microsoft server software
  - Must be used to use Microsoft’s Web development technology
  - Ships with
    » Windows 2000
    » Windows XP Professional
Working with Web Directories

- Folders on a server can be specified using either
  - A physical directory
    - A directory physically located in the Web site’s root directory
  - A virtual directory
    - A directory that does not have to be physically located in the Web site’s root directory

Benefits of virtual directories
- Shorter URLs
  - Easier to reference
  - Hide the physical directory structure
  - Helps to avoid security risks

Working with Web Directories

Reviewing HTML Basics

- HTML tags
  - Define the format of a Web page
  - Are predefined – have no relationship to the text they are marking
  - Consist of
    - A left angle bracket (<)
    - A tag name
    - A right angle bracket (>)
  - Many come in pairs:
    - A start tag
    - An end tag: uses a slash (/) to differentiate it from a start tag
  - May have attributes

- HTML
  - Element: the complete line, start tag through end tag
  - Content: the part between the tags
  - Empty elements or single tags
    - For example: <BR> tag
  - Code is not case sensitive

Exploring HTML Documents

- HTML documents
  - Text or ASCII files
  - Can be created using
    - A text editor
    - Visual Web development tools which use WYSIWYG
      - For example:
        - Microsoft FrontPage
        - Macromedia Dreamweaver

- <HTML></HTML> tag pair
  - Designates the beginning and end of the HTML document
- HEAD tags
  - Provide a section for documentation
- TITLE tags
  - Contain content that is displayed on the browser’s title bar
- BODY tags
  - Optional, but usually needed by Web pages

- Figure 12-4 HTML tags setting bold format
Object-Oriented Application Development Using VB .NET

Exploring HTML Documents

Table 12-1: Common HTML Tags (continued)

<table>
<thead>
<tr>
<th>Tag</th>
<th>Meaning</th>
<th>Useful Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;img&gt;</code></td>
<td>Image tag</td>
<td>ALIGN, SRC</td>
</tr>
<tr>
<td><code>&lt;a&gt;</code></td>
<td>Hyperlink</td>
<td>HREF, SRC</td>
</tr>
</tbody>
</table>

- Image tag (`<img>`)
  - Used to add images to Web pages
  - References a graphic image
- Hyperlinks (shortened name for hypertext links)
  - Provide the capability to branch to
    - A specified location in the current HTML document
    - Other HTML documents in your Web site
    - Other Web pages at another Web site
    - E-mail addresses
  - The physical link can be
    - A single word
    - Several words
    - An image

Figure 12-12 shows a Web page with a hyperlink and an image
Working with Images and Hyperlinks

- Layout of the information on a Web page
  - Can make the Web page easy or difficult to access and use
  - Can be designed using HTML tables
    - HTML tables provide a way to precisely control spacing

Using HTML Forms

- HTML forms
  - Collect user data
  - Send the input values to the server with the user’s request
    - Server program
      - Accesses the user data and responds accordingly by:
        - Dynamically creating an appropriate Web page
        - Returning Web page to the client browser
    - Created using the form tag pair (<form> </form>)

Using Form Controls

- HTML form controls
  - Similar to many of the controls used in the Windows environment
  - Also called form elements
  - Most have ASP.NET equivalents

Using HTML Forms

- Attributes of the start form tag
  - NAME: sets the form name
  - METHOD: can be set to POST or GET
    - POST: user data is placed in the form collection of the request object to be passed to the server
    - GET: user data is passed to the server by adding it to the end of the URL address
  - ACTION: specifies to what file program control is transferred when the Web page is submitted

Using Form Controls

<table>
<thead>
<tr>
<th>HTML Type or Tag</th>
<th>Form Control Attributes</th>
<th>VB and C# Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;input&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;select&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;textarea&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;button&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;form&gt;</td>
<td>NAME: sets the form name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>METHOD: can be set to POST or GET</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACTION: specifies to what file program control is transferred when the Web page is submitted</td>
<td></td>
</tr>
</tbody>
</table>
Classic ASP Web Development

- ASP
  - Has been a very popular technology for building Web applications
  - Dubbed “Classic ASP” since the introduction of ASP.NET
  - ASP.NET is based upon and uses parts of ASP
  - Allows the mixing of scripts with HTML code
  - A file with the .asp extension is processed with the ASP script engine on the server

Classic ASP Web Development

- ASP allows
  - Client-side processing
  - Server-side processing
- Client-side scripting
  - Validates data before sending it to the server
  - Used for Web page presentation effects
- Server-side scripting
  - Accepts user inputs
  - Obtains data from a database, if required
  - Processes, renders, and returns a Web page

Using ASP.NET to Develop Web Pages

- Goal of the .NET framework and VS .NET
  - Provide an integrated development environment (IDE) to support the development
    - Windows applications
    - Web applications

Separating Code from Content

- Typical ASP
  - Page includes programming script mixed with HTML tags
  - Difficult to cleanly separate the code from presentation and content
- ASP.NET
  - Separates Web page code from content and presentation (the GUI)
Separating Code from Content

- **ASP.NET**
  - Uses the code-behind technique, which:
    - Mimics the event-driven code-behind concept for Windows applications
  - Web form file
    - Contains presentation and content
    - Has an .aspx extension
  - Code-behind file
    - Contains the code
    - Has an .aspx.vb extension

Using HTML, HTML Server Controls, and ASP.NET Server Controls

- ASP.NET can be used to develop Web applications using
  - HTML
  - HTML server controls
  - ASP.NET server controls

Understanding the ASP.NET Page Event Life Cycle

- ASP.NET Page class has its own
  - Properties
  - Methods
  - Events
- ASP.NET page event life cycle
  - Page_Init event
    - Fired when a page is requested
    - Occurs before the controls are loaded onto the Web form
    - Can be used to handle data connection and initialization
  - Page_Load event (continued)
    - Occurs after the Page_Init event
    - Typically provides the location where the code to check for postback is included
      - Postback
        - Second and subsequent requests for a Web form page
        - Can be used to write code that is executed only on the first request for the Web page form
  - Page_Unload event
    - Occurs after the page has been unloaded
    - Before the page is sent to the browser
    - Used to clean up processing before the page is unloaded
      - Closing files and connections to data
      - Disposing of unneeded objects
Creating an ASP.NET Web Application

- In VS .NET, a ASP.NET Web application can be created by
  - Clicking the New Project button on the Start Page
  - Clicking Visual Basic Projects in the Project Types list, if necessary
  - Clicking the ASP.NET Web Application icon in the Templates list

Creating an ASP.NET Web Application

- Options for adding a control to the Web form
  - Double-click the control on the Toolbox
  - Select and drag the control onto the Web form
- `runat="server"` attribute
  - Specifies that the control will be processed on the server
  - Exists for all the ASP.NET controls
  - Can be added to an HTML control to make it an HTML server control

Creating an ASP.NET Survey Application

- An application for Bradshaw Marina that consists of:
  - A form to collect information about boat customers
  - A Web page where the information from the first form is posted
Creating the Results Web Page

- Results Web page
  - Requires the addition of a new Web form to the project

Creating the Results Web Page

- To add a new Web form to the project
  - Right-click the project in the Solutions Explorer window
  - Point to Add
  - Select Add Web Form on the shortcut menu

Using ASP.NET Validation Controls

- Data validation
  - An important part of any application that accepts user input

Adding Validation Controls to the Survey Web Page

- Validation controls added to the survey Web page
  - RequiredFieldValidator controls added to
    - Text box controls for
      - First name
      - Last name
      - Desired slip features
    - The radio button list
  - ValidationSummary control added to
    - The Panel control

Using the Code-Behind Window

- Code-behind file
  - Put code here
  - Code for click event

Adding Validation Controls to the Survey Web Page

Figure 12-37 Validation controls on the survey Web form
Using ASP.NET with a PD Class

- Example:
  - Customer data entry Web form
  - Used to create a number of Customer instances
  - Results Web form
    - Displays the values for each Customer instance that is created
    - Displays all the Customer instances in a text box
    - Allows the user to enter a phone number to locate a customer in the ArrayList of customers

Summary

- The Web uses the HTTP protocol and the HTML markup language
- Web applications can be static or dynamic
- HTML tags are used by browsers to render Web pages for display on display devices
- Web applications use a client-server computing architecture
- Web processing is based on the Request/Response model

- HTML forms have controls that allow for user input on a Web page to be sent to the server for processing
- Classic ASP is used to create dynamic Web applications by mixing programming script with HTML code
- ASP.NET clearly separates code from a Web page's presentation and content
- ASP.NET has validation controls to help ensure that valid data is entered into Web pages