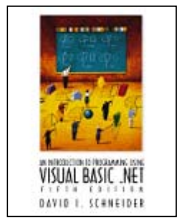
Chapter 9: Additional Controls & Objects

- List Boxes, Combo Boxes, and the File opening Control (9.1)
- Seven Elementary Controls (9.2)
- Four Additional objects (9.3)



David I. Schneider, *An Introduction to Programming using Visual Basic.NET, 5th Edition*, Prentice Hall, 2002.

List Boxes, Combo Boxes & File opening Control (9.1)

- The List Box Control
  - Items can be placed into the list at design time or runtime
  - The **Sorted** property causes items in the list to be sorted automatically
  - If the Sorted property is set to True, then the following will place an item into the list in order and assign the index of its position to num:

```
num = lstBox.Items.Add(str)
```

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- Useful Properties of the List Box
  - For the total number of items in a list box:

```
lstBox.Items.Count
```

  - For the index number of the currently highlighted item:

```
lstBox.SelectedIndex
```

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- More List Box Properties
  - lstBox.Items() is the list of items in the list box. The value of the item with an index of "n" is:

```
lstBox.Items(n)
```

  - The data type of the elements in the lstBox.Items() array is Object. To put the first element of lstBox.Items in a text box:

```
txtBox.Text = CStr(lstBox.Items(0))
```

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- Currently Highlighted Item in a List Boxes

The currently highlighted item can be obtained by:

```
lstBox.Items(lstBox.SelectedIndex)
```

Or

```
lstBox.Text
```

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- Removing Items from a List Box
  - To delete an item at a given location:

```
lstBox.Items.RemoveAt(n)
```

  - To delete the first occurrence of an item:

```
lstBox.Items.Remove(str)
```

  - To remove everything from a list box:

```
lstBox.Items.Clear()
```

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- List Box Events
  - Three main types of events with list boxes:
    - Click – if the user clicks on an item in the list box
    - SelectedIndexChanged - if the user clicks on an item or uses the arrow keys to select it
    - DoubleClick - if the user double-clicks on an item

    Click, DoubleClick, and SelectedIndexChanged events are triggered when the user double-clicks.

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- Example 1

```
Private Sub lstOxys_SelectedIndexChanged(...)
    Handles lstOxys.SelectedIndexChanged
  txtSelected.Text = CStr(lstOxys.SelectedItem)
End Sub
Private Sub btnAdd_Click(...) Handles btnAdd.Click
  Dim item As String
  item = InputBox("Item to Add:")
  lstOxys.Items.Add(item)
End Sub
Private Sub lstOxys_DoubleClick(...)
    Handles lstOxys.DoubleClick
  lstOxys.Items.RemoveAt(lstOxys.SelectedIndex)
  txtSelected.Clear()
End Sub
```

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- Filling a List Box at Design Time

1. Select the Items property of the list box.
2. Click on the ellipses button on the right side of the Settings box. (A window titled String Collection Editor will be displayed.)
3. Type in the first item, and press Enter.
4. Repeat Step 3 for each of the other items.
5. When you are finished entering items, click on the OK button.

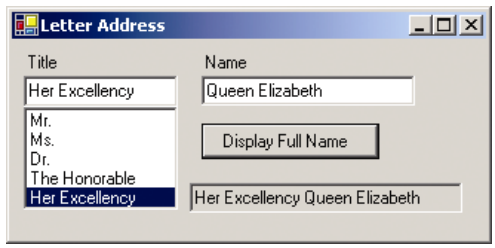
List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- The Combo Box Control
  - A list box combined with a text box
  - The user has the option of selecting from a list or typing in something
  - Three types of combo boxes in the DropDownStyle property:
    - Simple
    - DropDown
    - DropDownList

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- Example 2

```
Private Sub btnDisplay_Click(...)
    Handles btnDisplay.Click
  txtDisplay.Text = cboTitle.Text & " " & txtName.Text
End Sub
```

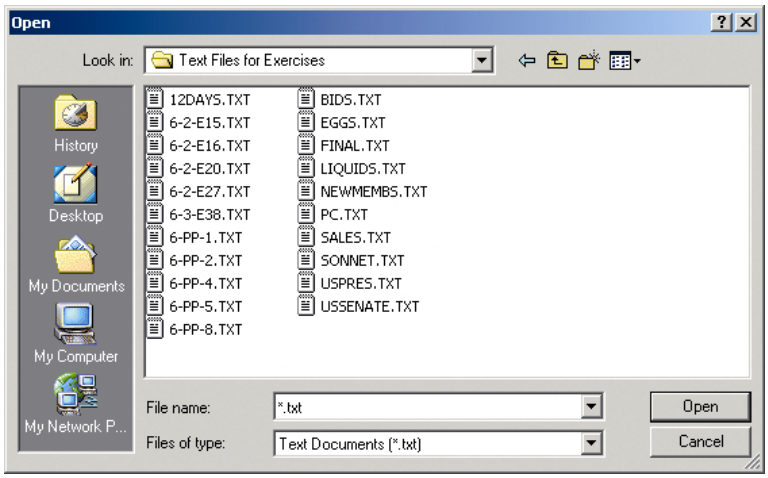


List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- The OpenFileDialog Control
  - Implements the standard File Open dialog box
  - Normally the 37th control in the Tool Box
  - When you place the control on the form, it will not be visible
  - The icon and default name will appear in the pane below the Main area

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- An Open File Dialog Box



List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- Using the OpenFileDialog control
  - To display the control:

```
OpenFileDialog1.ShowDialog()
```

  - After the Open button has been pressed, the file name selected and its complete filespec will be contained in the property:

```
OpenFileDialog1.FileName
```

List Boxes, Combo Boxes, and the File opening Control (9.1) (cont.)

- Example 3

```
Private Sub btnSelect_Click(...)
    Handles btnSelect.Click
  Dim textFile As String
  OpenFileDialog1.ShowDialog()
  textFile = OpenFileDialog1.FileName
  Dim sr As IO.StreamReader =
            IO.File.OpenText(textFile)
  lstOutput.Items.Clear()
  Do While sr.Peek <> -1
    lstOutput.Items.Add(sr.ReadLine)
  Loop
  sr.Close()
End Sub
```

Seven Elementary Controls (9.2)

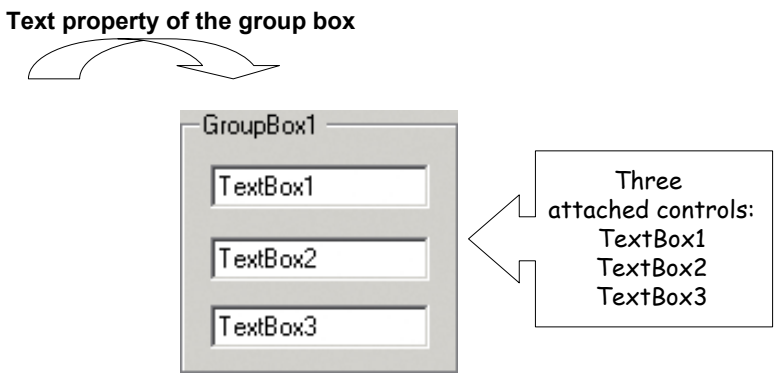
- The Group Box Control
- The Check Box Control
- The Radio Button Control
- The Timer Control
- The Picture Box Control
- The Horizontal and Vertical Scroll Bar Controls

Seven Elementary Controls (9.2) (cont.)

- The Group Box Control
  - Group boxes are passive objects used to group other objects together
  - When you drag a group box, the attached controls follow as a unit
  - To attach a control to a group box, create the group box, then drag the control you want to attach into the group box

Seven Elementary Controls (9.2) (cont.)

- Group Box Example



Seven Elementary Controls (9.2) (cont.)

- The Check Box Control
  - Consists of a small square and a caption
  - Presents the user with a Yes/No choice
  - Checked property is True when the check box is checked and False when it is not
  - CheckedChanged event is triggered when the user clicks on the check box

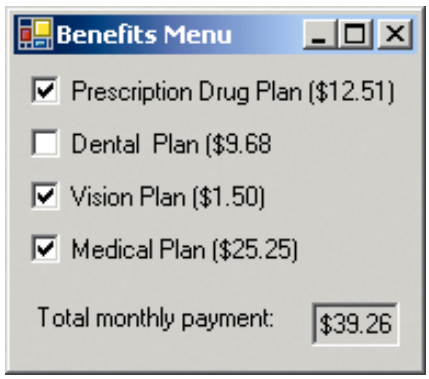
Seven Elementary Controls (9.2) (cont.)

- Example 1

```
Private Sub Tally(...) Handles chkDrugs.CheckedChanged,
   chkDental.CheckedChanged, chkVision.CheckedChanged,
   chkMedical.CheckChanged
  Dim sum As Double = 0
  If chkDrugs.Checked Then
    sum += 12.51
  End If
  If chkDental.Checked Then
    sum += 9.68
  End If
  If chkVision.Checked Then
    sum += 1.5
  End If
  If chkMedical.Checked Then
    sum += 25.25
  End If
  txtTotal.Text = FormatCurrency(sum)
End Sub
```

Seven Elementary Controls (9.2) (cont.)

- Example 1 output



Seven Elementary Controls (9.2) (cont.)

- The Radio Button Control
  - Consists of a small circle with a caption (that is set by the Text property)
  - Give the user a single choice from several options
  - Clicking on one removes the selection from another
  - Normally Radio Buttons are attached to a Group Box

Seven Elementary Controls (9.2) (cont.)

- Radio Button Properties
  - To determine if the button is on or off

```
radButton.Checked
```

  - To turn a button on

```
radButton.Checked = True
```

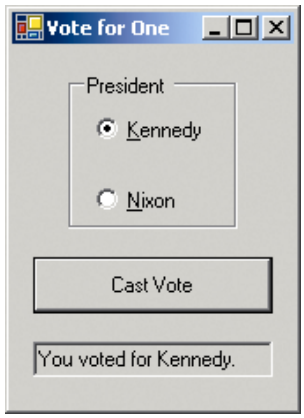
Seven Elementary Controls (9.2) (cont.)

- Example 2

```
Private Sub btnVote_Click(...)
    Handles btnVote.Click
  If radCandidate1.Checked Then
    txtVote.Text = "You voted for
 Kennedy."
  ElseIf radCandidate2.Checked Then
    txtVote.Text = "You voted for Nixon."
  Else
    txtVote.Text = "You voted for
 neither."
  End If
End Sub
```

Seven Elementary Controls (9.2) (cont.)

- Example 2 output



Seven Elementary Controls (9.2) (cont.)

- The Timer Control
  - Invisible during runtime
  - Triggers an event after a specified period of time
  - The Interval property specifies the time period – measured in milliseconds
  - To begin timing, set the Enabled property to True
  - To stop timing, set the Enabled property to False
  - The event triggered each time Timer1.Interval elapses is called Timer1.Tick.

Seven Elementary Controls (9.2) (cont.)

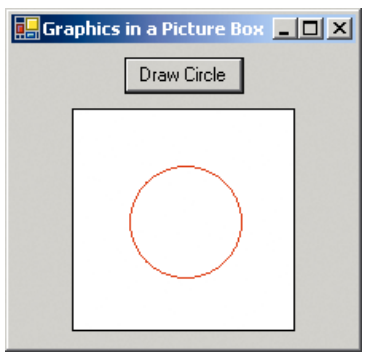
- The Picture Box Control
  - Designed to hold drawings and pictures
  - To draw a blue rectangle with the upper left hand corner *x* pixels from the left of the picture box and *y* pixels from the top, with width *w* and height *h:*

```
picBox.CreateGraphics.
     DrawRectangle(Pens.Blue, x, y, w, h)
```

Seven Elementary Controls (9.2) (cont.)

- Picture Box Containing a Red Circle

```
picBox.CreateGraphics.
  DrawEllipse(Pens.Red, 35, 35, 70, 70)
```



Seven Elementary Controls (9.2) (cont.)

- Picture Box Properties
  - A picture can be placed in a picture box control with the **Image** property.
  - Prior to setting the Image property, set the SizeMode property.
    - AutoSize will cause the picture box control to be resized to fit the picture.
    - StretchImage will cause the picture to be resized to fit the picture box control.

Seven Elementary Controls (9.2) (cont.)

- Picture Box at Run Time
  - A picture also can be assigned to a picture box control at run time:

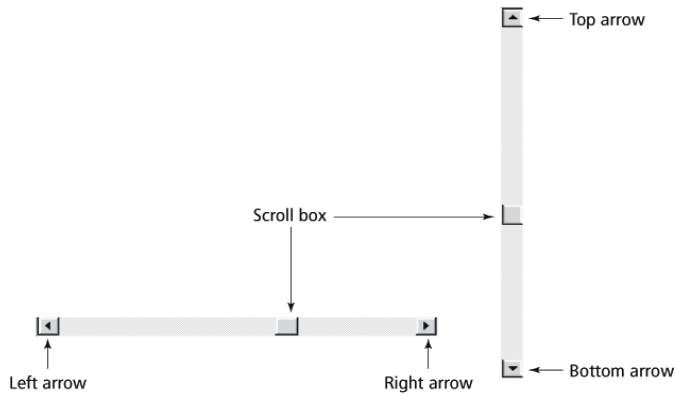
```
picBox.Image = Image.FromFile(filespec)
```

  - The SizeMode property can be altered at run time with a statement such as

```
picBox.SizeMode = PictureBoxSizeMode.AutoSize
```

Seven Elementary Controls (9.2) (cont.)

- The Horizontal and Vertical Scroll Bars



Seven Elementary Controls (9.2) (cont.)

- Scroll Bar Behavior
  - When the user clicks on one of the arrow buttons, the scroll box moves a small amount toward that button.
  - When the user clicks between the scroll box and one of the arrow buttons, the scroll box moves a large amount toward that button.
  - The user can also move the scroll box by dragging it.

Seven Elementary Controls (9.2) (cont.)

- Scroll Bar Properties
  - The main properties of a scroll bar control are
    - Minimum
    - Maximum
    - Value
    - SmallChange,
    - LargeChange
  - hsbBar.Value is a number between hsbBar.Minimum and hsbBar.Maximum

Seven Elementary Controls (9.2) (cont.)

- Scroll Bar Notes
  - The setting for the Minimum property must be less than the setting for the Maximum property.
  - The Minimum property determines the values for the left and top arrow buttons.
  - The Maximum property determines the values for the right and bottom arrow buttons.
  - The Scroll event is triggered whenever any part of the scroll bar is clicked.

Four Additional Objects (9.3)

- The Clipboard Object
- The Random Class
- The MainMenu Control
- Multiple Forms

Four Additional Objects (9.3) (cont.)

- The Clipboard Object
  - Used to copy information from one place to another
  - Maintained by Windows so it can even be used with programs outside VB.NET
  - A portion of memory that has no properties or events

Four Additional Objects (9.3) (cont.)

- Using the Clipboard Object
  - To place something in the Clipboard:

```
Clipboard.SetDataObject(str)
```

  - To get something out of the Clipboard:

```
Dim data As IDataObject = _
   Clipboard.GetDataObject()
str = CStr(data.GetData(DataFormats.Text))
```

  - To delete the contents of the Clipboard

```
Clipboard.SetDataObject("")
```

Four Additional Objects (9.3) (cont.)

- The Random Class
  - A random number generator declared with the statement:

```
Dim randomNum As New Random()
```

  - If *m* and *n* are whole numbers and *m* < *n* then the following generates a whole number between *m* and *n (including m, but excluding n)*

```
randomNum.Next(m, n)
```

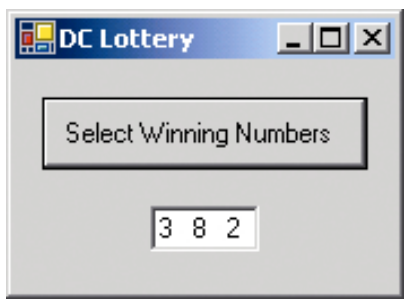
Four Additional Objects (9.3) (cont.)

- Example 1

```
Private Sub btnSelect_Click(...)Handles
 btnSelect.Click
'Display the winning lottery numbers
  Dim randomNum As New Random()
  Dim num1, num2, num3 As Integer
  num1 = randomNum.Next(0, 10)
  num2 = randomNum.Next(0, 10)
  num3 = randomNum.Next(0, 10)
  txtNumbers.Text = num1 & " " & num2 & "
 " & num3
End Sub
```

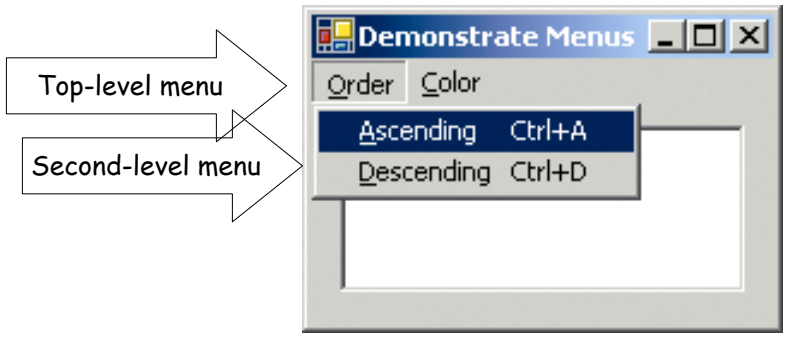
Four Additional Objects (9.3) (cont.)

- Example 1 Output



Four Additional Objects (9.3) (cont.)

- The Main Menu Control



Four Additional Objects (9.3) (cont.)

- Menu Events
  - Each menu item responds to the Click event
  - Click event is triggered by
    - the mouse
    - Alt + access key
    - Shortcut key

Four Additional Objects (9.3) (cont.)

- Multiple Forms
  - VB.NET programs can contain more than one form
  - To add the new form select Windows Form from the Templates pane, optionally type in a name, and press the Open button.

Four Additional Objects (9.3) (cont.)

- Variables and Multiple Forms
  - Local variables are declared with Dim
  - Class-level variables are declared with Dim
  - Variables declared with Public will be available to all forms in the program.
  - When a Public variable is used in another form, it is referred to by an expression such as
    secondForm.*variableName*.