

CHAPTER 2**EXERCISES 2.2**

1. While the mouse is still hovering over the button that was just clicked, the button has a pale blue color.
2. Tabbing to another control, clicking on another control, or pressing Alt plus the access key for another control.
3. Click on the form to make it the selected object.
Click on the Properties window or Press F4 to activate the Properties window.
Select the Text property.
Type "CHECKING ACCOUNT" and press the Enter key.
4. Double-click the TextBox icon in the Toolbox.
Activate the Properties window, and select the ForeColor property.
Click on the down-arrow button to the right of the Settings box.
Click on the Custom tab.
Click on the desired blue in the palette.
Move around the Properties window with the up- and down-arrow keys until the Text property is selected.
Click on the Settings box and then type "PLAY IT, SAM" (without the quotes).
Click on the text box and then widen it slightly to see the words.
5. Double-click the TextBox icon in the Toolbox.
Activate the Properties window.
Select the BackColor property.
Click on the down-arrow to the right of the Settings box.
Click on the Custom tab, and then click on the desired yellow in the palette.
Click on the form to see the empty yellow text box.
6. Double-click on the TextBox icon in the Toolbox.
Activate the Properties window, and select the Name property.
Type "txtGreeting". (The name will appear in the Settings box.)
Select the Text property.
Type the requested word, "HELLO".
Select the Font property.
Click on the ellipsis to the right of the Settings box.
Click on the Size box.
To increase the size of the word, either type the number for the font size (such as "14") or click on a number in the list below the current size.
Click on Italic in the "Font style" list.
Click OK.
If necessary, widen the text box.

7. Double-click on the Label icon in the Toolbox.
Activate the Properties window, and select the AutoSize property.
Set the AutoSize property to False.
Select the Text property and type the requested sentence.
Select the TextAlign property.
Click on the down-arrow button to the right of the Settings box, and click on one of the center rectangles.
Resize the label so that the sentence occupies three lines.
8. Double-click on the TextBox icon in the Toolbox.
Activate the Properties window, and select the Text property.
Type "Visual Basic" and then press the Enter key.
If the text isn't all visible, drag the text box's right sizing handle to the right until all the text can be seen.
Select the ReadOnly property.
Double-click on the ReadOnly property to change it's setting to True. (Or, go to the Settings box, press the down-arrow button, and click on True.)
Select the Font property.
Click on the ellipsis to the right of the Settings box.
In the Font style box, click on Bold.
Click OK.
Select the BackColor property and click on the down-arrow button.
Click on the Custom tab.
Click on the desired red in the palette.
Select the ForeColor property and click on the down-arrow button.
Click on the Custom tab.
Click on the white square in the upper-left corner of the palette.
9. Double-click on the TextBox icon in the Toolbox.
Activate the Properties window.
Set the Name property to txtLanguage.
Select the Text property and type "Visual Basic 2012".
Select the Font property and click on the ellipsis to the right of the Settings box.
Scroll up the Font list box, and click on Courier New in the Font box.
Click OK.
Widen the text box to accommodate its text.
10. Double-click on the Button icon in the Toolbox.
Activate the Properties window, and select the Text property.
Type "PUSH".
Select the BackColor property and click on the down-arrow button.
Click on the Custom tab.
Click on the yellow square (the third square in the fourth column) in the palette.
Double-click on the setting for the (Name) property, type in "btnPush", and press the Enter key.

11. Double-click on the Button icon in the Toolbox.
Activate the Properties window, and select the BackColor property.
Click on the down-arrow button to the right of the Settings box.
Click on the Custom tab, and then click on the white square in upper-left corner of the palette.
Select the Text property and type "PUSH".
Select the Font property, and click on the ellipsis.
Click on *Italic* (with Windows Vista) or *Oblique* (with Windows 7 & 8) in the "Font style" list.
Click on 24 in the Size box and click OK.
Resize the button.
12. Double-click on the Button icon in the Toolbox.
Activate the Properties window, and select the Text property.
Type "&PUSH".
Select the Font property and click on the ellipsis.
Click on Bold in the "Font Style" box.
Click OK.
Click on the form to see the resulting button.
13. Double-click on the Button icon in the Toolbox.
Activate the Properties window.
Select the Text property and type "PUS&H".
Click on the form to see the resulting button.
14. Double-click on the Label icon in the Toolbox.
Activate the Properties window, and select the Text property.
Type "ALIAS".
Select the ForeColor property and click on the down-arrow button.
Click on the Custom tab.
Click on the desired white in the palette.
Select the BackColor property and click on the down-arrow button.
Click on the Custom tab.
Click on the desired shade of blue in the palette.
Click on the form to see the resulting label.

15. Double-click on the Label icon in the Toolbox.
Activate the Properties window.
Select the Name property and type "lblAKA".
Select the Text property and type "ALIAS".
Select the AutoSize property and set it to False.
Select the Font property and click on the ellipsis.
Click on *Italic* (with Windows Vista) or *Oblique* (with Windows 7 & 8) in the "Font style" list.
Click OK.
Select the TextAlign property, click on the down-arrow box to the right of the Settings box, and click on one of the center rectangles.
16. Click on the form to make it the selected object.
Activate the Properties window, and select the Text property.
Type "BALANCE SHEET".
Select the BackColor property and click on the down-arrow button.
Click on the Custom tab.
Click on the desired shade of yellow in the palette.
17. Double-click on the Label icon in the Toolbox.
Activate the Properties window, and select the TextAlign property.
Click on the down-arrow box to the right of the Settings box, and click on one of the rectangles on the right.
Select the AutoSize property and set it to False.
Select the Text property, type "VISUAL BASIC", and press Enter.
If the words " VISUAL BASIC " are on one line, resize the label until the words occupy two lines.
18. In the Solution Explorer, right-click on the file Form1.vb.
Select "Rename" from the drop-down list.
Change the filename from Form1.vb to frmHello.vb.
In the Properties window, change the setting of the Text property from Form1 to Hello World.
19. Double-click on the Label icon in the Toolbox.
Activate the Properties window and set the Text property of the label to PROGRAM.
Select the Font property, and click on the ellipsis to the right of its Settings box.
Click on *Italic* (with Windows Vista) or *Oblique* (with Windows 7 & 8) in the "Font style" list, and click on the *Underline* box.
Click on the OK button.

20. Double-click on the Label icon in the Toolbox.
Activate the Properties window, and select the Text property.
Type "ALIAS".
Select the Font property and click on the ellipsis.
Click on Bold in the Font style box.
Click on Courier New in the Font box and press OK.
Click on the form to see the resulting label.
21. Double-click on the ListBox icon in the Toolbox.
Activate the Properties window, and select the BackColor property.
Click on the down-arrow button to the right of the Settings box.
Click on the Custom tab and click on the desired yellow square in the palette.
Click on the form.
22. Double-click on the ListBox icon in the Toolbox.
Activate the Properties window, and select the Visible property.
Double-click on the Visible property to change its setting to False. (Or, go to the Settings box, press the down-arrow button, and click on False.)
23. In the Solution Explorer window, right-click on "Form1.vb" and select *Rename* from the context menu that appears.
Change Form1.vb to frmYellow.vb.
Right-click on the form in the Form Designer, and select Properties from the context menu.
Click on BackColor property in the Properties window.
Click on the down-arrow button in the right part of the Settings box, click on the Custom tab, and click on a yellow square.
24. Double-click on the Button icon in the Toolbox.
Activate the Properties window and set the Text property of the button to BUTTON.
Select the Font property, and click on the ellipsis to the right of its Settings box.
Click on *Bold* in the "Font style" list.
Place a check mark in the small square to the left of the word "Underline" by clicking on the square.
Click on the OK button.
25. Begin a new program.
Change the text in the form's title bar to "Dynamic Duo".
Place two buttons on the form.
Position and resize the buttons as shown.
Enter "Batman" as the text of the first button, and enter "Robin" as the text of the second button.
Increase the font size for both buttons to 14.

- 26.** Begin a new program.
 Change the text in the form's title bar to "Enter Names".
 Place on the form a label, a text box, and a button in the sizes and locations shown. Change the text on the label to "Name".
 Change the text on the button to "Enter".
 Increase the Font size for the label and the button to 12.
- 27.** Begin a new program.
 Change the text in the form's title bar to "Fill the Blank".
 Place a label, a text box, and another label on the form at appropriate locations.
 Change the Text setting of the first label to "I'm the king of the" and the Text setting of the second label to "A Quote by Leonardo DiCaprio".
- 28.** Begin a new program.
 Change the text in the form's title bar to "Similarity".
 Place a big label and a normal-sized label on the form.
 Move the small label to the bottom of the form, and move and resize the big label so that it covers most of the top of the form.
 Select the normal-sized label.
 Change the setting of the Text property to "A Quote".
 Select the big label.
 Change the setting of the Text property to the specified sentence.
 Increase the font size to 12.
 Resize and position the labels as needed.
- 29.** Begin a new program.
 Change the text in the form's title bar to "Uncle's Advice".
 Place five labels and three buttons on the form at appropriate locations.
 Change the Text setting of each label as indicated.
 Change the settings of the buttons' Text properties to "1", "2", and "3".
 Resize and position the labels and buttons.
- 30.** Begin a new program.
 Change the text in the form's title bar "3 Rectangles".
 Place a label on the form and increase its size to provide plenty of space.
 Change the background color to red.
 Place a smaller label inside the red label.
 Change its background color to some shade of white.
 Finally, place a yet smaller label inside the white box.
 Change its background color to blue.
 Resize and position the labels as needed.
- 33.** 1 **34.** 0
- 35.** Each arrow key moves the text box in the indicated direction.

36. Pressing the right- and left-arrow keys widen and narrow the text box. The up- and down-arrow keys have no effect.
37. Pressing the right and left arrow keys widens and narrows the text boxes, buttons, and list boxes in the group of selected controls. The up and down arrow keys shorten and lengthen the buttons and list boxes in the group. The arrow keys have no effect on the labels, and only the left and right arrow keys affect the text boxes.
38. Each arrow key moves every control in the group in the indicated direction.
39. Drag a label and a list box onto the form.
Click on the label.
Hold down the Ctrl key and click on the list box. (You have now selected a group of two controls.)
In the Properties window, click on the symbol to the left of the Font property.
Click on the Size property, change the setting to 12, and press the Enter key.
- (**Alternative:** Replace the last three lines with the following steps.)
- In the Properties window, select the Font property.
Click on the ellipsis button to the right of the Settings box.
Click on 12 in the Size list and click on the OK button.
40. The button moves to a comfortable distance from one of the sides of the form.
41. The label is positioned just to the left of the text box, and the middles of the two controls are aligned.
42. The left sides of the buttons are aligned and the two buttons are a comfortable distance apart.
43. *Center* refers to the midpoint horizontally, whereas *middle* refers to the midpoint vertically.
44. Select the four buttons as a group. Click on the Format menu, click on Make Same Size, and then click on Both. Click on the Format menu again, click on Vertical Spacing, and then click on Make Equal.
45. First blue snap line: tops of the two controls are aligned
Purple snap line: texts of the two controls are aligned
Second blue snap line: bottoms of the two controls are aligned
46. The setting toggles between True and False.
47. The setting is cycling through the different available colors.

EXERCISES 2.3

1. The word Hello
2. The word Hello in red letters
3. The word Hello on an orange-colored background
4. The word Hello
5. The text box vanishes.
6. The word Hello on a yellow background
7. The word Hello in green letters
8. The word Hello on a white background
9. The word Hello on a gold background.
10. Nothing, the label cannot be seen.
11. `Form1.Text` should be `Me.Text`.
12. The word Hello must be surrounded with quotation marks.
13. Red should be replaced with `Color.Red`.
14. Replace `txtBox` with `txtBox.Text`.
15. `Font.Size` is a read-only property. The statement `txtOutput.Text = txtBox.Font.Size` is valid since it is reading the value of `txtBox.Font.Size`. However, `txtBox.Font.Size = 20` is not valid since it is setting the value of `txtBox.Font.Size`.
16. `Me.Color` must be replaced by `Me.ForeColor` or `Me.BackColor`
17. `lblTwo.Text = "E.T. phone home."`
18. `lblTwo.Text = "Play it, Sam."`
19. `txtBox.ForeColor = Color.Red`
`txtBox.Text = "The stuff that dreams are made of."`
20. `txtBox.ForeColor = Color.Blue`
`txtBox.BackColor = Color.Gold`
`txtBox.Text = "Life is like a box of chocolates."`
21. `txtBox.Enabled = False`

- 22. `Me.Text = "Hello World"`
- 23. `lblTwo.Visible = False`
- 24. `lblName.ForeColor = Color.Red`
- 25. `btnOutcome.Enabled = True`
- 26. `btnCompute.Focus()`
- 27. `txtBoxTwo.Focus()`
- 28. `Me.BackColor = Color.White`
- 29. The Enter event occurs when a control gets the focus.
- 30. A control's Leave event occurs when the control loses the focus.
- 31.

```
Private Sub Label1_Click(...) Handles Label1.Click
    lstOutput.Items.Add("Click")
End Sub

Private Sub Label1_DoubleClick(...) Handles Label1.DoubleClick
    lstOutput.Items.Add("Double Click")
End Sub
```

Whenever the DoubleClick event is raised, the Click event is also raised.

- 32.

```
Private Sub Button1_Click(...) Handles Button1.Click
    lstOutput.Items.Add("Click")
End Sub
```
- 33.

```
Private Sub btnLeft_Click(...) Handles btnLeft.Click
    txtBox.Text = "Left Justify"
    txtBox.TextAlign = HorizontalAlignment.Left
End Sub

Private Sub btnCenter_Click(...) Handles btnCenter.Click
    txtBox.Text = "Center"
    txtBox.TextAlign = HorizontalAlignment.Center
End Sub

Private Sub btnRight_Click(...) Handles btnRight.Click
    txtBox.Text = "Right Justify"
    txtBox.TextAlign = HorizontalAlignment.Right
End Sub
```
- 34.

```
Private Sub btnSmile_Click(...) Handles btnSmile.Click
    lblFace.Text = ":-)"
End Sub

Private Sub btnFrown_Click(...) Handles btnFrown.Click
    lblFace.Text = ":-("
```

```
End Sub
```

```
35. Private Sub btnRed_Click(...) Handles btnRed.Click
    txtBox.BackColor = Color.Red
End Sub
```

```
Private Sub btnBlue_Click(...) Handles btnBlue.Click
    txtBox.BackColor = Color.Blue
End Sub
```

```
Private Sub btnWhite_Click(...) Handles btnWhite.Click
    txtBox.ForeColor = Color.White
End Sub
```

```
Private Sub btnYellow_Click(...) Handles btnYellow.Click
    txtBox.ForeColor = Color.Yellow
End Sub
```

```
36. Private Sub txtOne_Enter(...) Handles txtOne.Enter
    txtOne.ForeColor = Color.Red
    txtTwo.ForeColor = Color.Black
    txtThree.ForeColor = Color.Black
End Sub
```

```
Private Sub txtTwo_Enter(...) Handles txtTwo.Enter
    txtOne.ForeColor = Color.Black
    txtTwo.ForeColor = Color.Red
    txtThree.ForeColor = Color.Black
End Sub
```

```
Private Sub txtThree_Enter(...) Handles txtThree.Enter
    txtOne.ForeColor = Color.Black
    txtTwo.ForeColor = Color.Black
    txtThree.ForeColor = Color.Red
End Sub
```

```
Private Sub btnLeft_Click(...) Handles btnLeft.Click
    txtOne.TextAlign = HorizontalAlignment.Left
    txtTwo.TextAlign = HorizontalAlignment.Left
    txtThree.TextAlign = HorizontalAlignment.Left
End Sub
```

```
Private Sub btnRight_Click(...) Handles btnRight.Click
    txtOne.TextAlign = HorizontalAlignment.Right
    txtTwo.TextAlign = HorizontalAlignment.Right
    txtThree.TextAlign = HorizontalAlignment.Right
End Sub
```

```
37. Private Sub txtLife_Enter(...) Handles txtLife.Enter
    txtQuote.Text = "I like life, it's something to do."
End Sub
```

```
Private Sub txtFuture_Enter(...) Handles txtFuture.Enter
    txtQuote.Text = "The future isn't what it used to be."
End Sub
```

```
Private Sub txtTruth_Enter(...) Handles txtTruth.Enter
    txtQuote.Text = "Tell the truth and run."
End Sub
```

```
38. Private Sub btnDisable_Click(...) Handles btnDisable.Click
    txtBox.Enabled = False
End Sub
```

```
Private Sub btnEnable_Click(...) Handles btnEnable.Click
    txtBox.Enabled = True
    txtBox.Focus()
End Sub
```

```
39. Private Sub btnOne_Click(...) Handles btnOne.Click
    btnOne.Visible = False
    btnTwo.Visible = True
    btnThree.Visible = True
    btnFour.Visible = True
End Sub
```

```
Private Sub btnTwo_Click(...) Handles btnTwo.Click
    btnOne.Visible = True
    btnTwo.Visible = False
    btnThree.Visible = True
    btnFour.Visible = True
End Sub
```

```
Private Sub btnThree_Click(...) Handles btnThree.Click
    btnOne.Visible = True
    btnTwo.Visible = True
    btnThree.Visible = False
    btnFour.Visible = True
End Sub
```

```
Private Sub btnFour_Click(...) Handles btnFour.Click
    btnOne.Visible = True
    btnTwo.Visible = True
    btnThree.Visible = True
    btnFour.Visible = False
End Sub
```

```

40. Private Sub txtGreen_Enter(...) Handles txtGreen.Enter
    txtGreen.BackColor = Color.Green
    txtYellow.BackColor = Color.DarkGray
    txtRed.BackColor = Color.DarkGray
End Sub

Private Sub txtYellow_Enter(...) Handles txtYellow.Enter
    txtGreen.BackColor = Color.DarkGray
    txtYellow.BackColor = Color.Yellow
    txtRed.BackColor = Color.DarkGray
End Sub

Private Sub txtRed_Enter(...) Handles txtRed.Enter
    txtGreen.BackColor = Color.DarkGray
    txtYellow.BackColor = Color.DarkGray
    txtRed.BackColor = Color.Red
End Sub

41. Private Sub btnVanish_Click(...) Handles btnVanish.Click
    lblFace.Visible = False
End Sub

Private Sub btnReappear_Click(...) Handles btnReappear.Click
    lblFace.Visible = True
End Sub

42. Private Sub txtName_Enter(...) Handles txtName.Enter
    lblInstructions.Text = "Enter your full name."
End Sub

Private Sub txtPhone_Enter(...) Handles txtPhone.Enter
    lblInstructions.Text = "Enter your phone number, including area code."
End Sub

43. Private Sub btnAny_Click(...) Handles btnOne.Click, btnTwo.Click
    txtOutput.Text = "You just clicked on a button."
End Sub

44. Private Sub txtBox1_Click(...) Handles txtBox1.Click
    txtBox2.Text = txtBox1.Text
    txtBox1.Clear()
End Sub

Private Sub txtBox2_Click(...) Handles txtBox2.Click
    txtBox1.Text = txtBox2.Text
    txtBox2.Clear()
End Sub

```

CHAPTER 3

EXERCISES 3.1

1. 12 2. 49 3. .125 4. 23 5. 8
6. -96 7. 2 8. 2 9. 1 10. 3
11. Not valid 12. Not valid 13. Valid 14. Not valid 15. Not valid 16. Not valid
17. 10 18. 14 19. 16 20. 16 21. 9 22. 8

23. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`
 `lstOutput.Items.Add((7 * 8) + 5)`
 `End Sub`

24. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`
 `lstOutput.Items.Add((1 + (2 * 9)) ^ 3)`
 `End Sub`

25. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`
 `lstOutput.Items.Add(0.055 * 20)`
 `End Sub`

26. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`
 `lstOutput.Items.Add(15 - 3 * (2 + (3 ^ 4)))`
 `End Sub`

27. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`
 `lstOutput.Items.Add(17 * (3 + 162))`
 `End Sub`

28. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`
 `lstOutput.Items.Add((4 + (1 / 2)) - (3 + (5 / 8)))`
 `End Sub`

29.

	x	y
<code>Private Sub btnEvaluate_Click(...) Handles btnEvaluate.Click</code>		
<code>Dim x, y As Double</code>	0	0
<code>x = 2</code>	2	0
<code>y = 3 * x</code>	2	6
<code>x = y + 5</code>	11	6
<code>lstResults.Items.Clear()</code>	11	6
<code>lstResults.Items.Add(x + 4)</code>	11	6
<code>y = y + 1</code>	11	7
<code>End Sub</code>		

30.

	bal	inter	withDr
Private Sub btnEvaluate_Click(...) Handles btnEvaluate.Click			
Dim bal, inter, withDr As Double	0	0	0
bal = 100	100	0	0
inter = 0.05	100	0.05	0
withDr = 25	100	0.05	25
bal += inter * bal	105	0.05	25
bal = bal - withDr	80	0.05	25
End Sub			

- ```

60. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim costPerShare, numberOfShares, amount As Double
 costPerShare = 25.625
 numberOfShares = 400
 amount = costPerShare * numberOfShares
 lstOutput.Items.Add(amount)
End Sub

61. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim price, discountPercent, markdown As Double
 price = 19.95
 discountPercent = 30
 markdown = (discountPercent / 100) * price
 price = price - markdown
 lstOutput.Items.Add(Math.Round(price, 2))
End Sub

62. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim fixedCosts, pricePerUnit, costPerUnit, breakEvenPoint As Double
 fixedCosts = 5000
 pricePerUnit = 8
 costPerUnit = 6
 breakEvenPoint = fixedCosts / (pricePerUnit - costPerUnit)
 lstOutput.Items.Add(breakEvenPoint)
End Sub

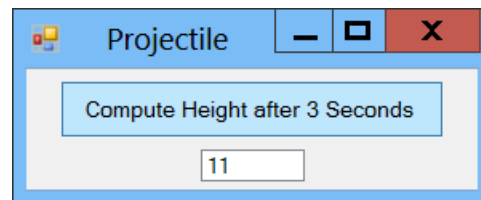
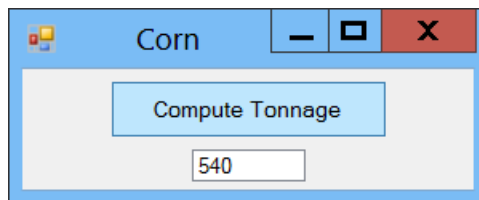
63. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim balance As Double
 balance = 100
 balance += 0.05 * balance
 balance += 0.05 * balance
 balance += 0.05 * balance
 lstOutput.Items.Add(Math.Round(balance, 2))
End Sub

64. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim balance As Double
 balance = 100
 balance += 0.05 * balance + 100
 balance += 0.05 * balance + 100
 balance += 0.05 * balance
 lstOutput.Items.Add(Math.Round(balance, 2))
End Sub

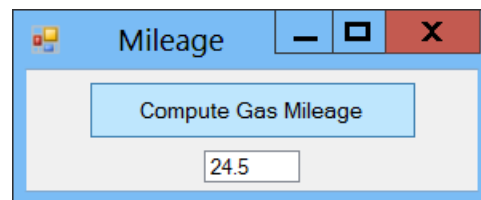
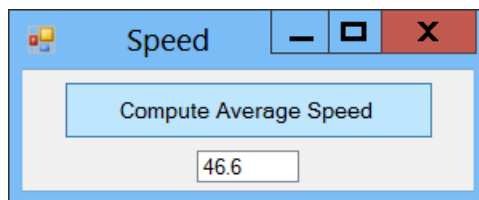
65. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim balance As Double
 balance = 100
 balance = balance * (1.05 ^ 10)
 lstOutput.Items.Add(Math.Round(balance, 2))
End Sub

```

66. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`  
`Dim purchasePrice, sellingPrice, percentProfit As Double`  
`purchasePrice = 10`  
`sellingPrice = 15`  
`percentProfit = 100 * (sellingPrice - purchasePrice) / purchasePrice`  
`lstOutput.Items.Add(percentProfit)`  
`End Sub`
67. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`  
`Dim acres, yieldPerAcre, corn As Double`  
`acres = 30`  
`yieldPerAcre = 18`  
`corn = yieldPerAcre * acres`  
`lstOutput.Items.Add(corn)`  
`End Sub`



68. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`  
`Dim initialVelocity, initialHeight, height, t As Double`  
`initialVelocity = 50`  
`initialHeight = 5`  
`t = 3`  
`height = (-16 * t ^ 2) + (initialVelocity * t) + initialHeight`  
`lstOutput.Items.Add(height)`  
`End Sub`
69. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`  
`Dim distance, elapsedTime, averageSpeed As Double`  
`distance = 233`  
`elapsedTime = 7 - 2`  
`averageSpeed = distance / elapsedTime`  
`lstOutput.Items.Add(averageSpeed)`  
`End Sub`

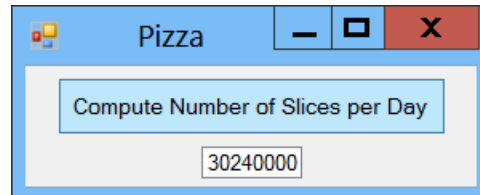
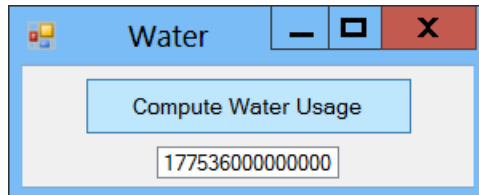


70. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`  
`Dim miles, gallonsUsed, milesPerGallon As Double`  
`miles = 23695 - 23352`  
`gallonsUsed = 14`  
`milesPerGallon = miles / gallonsUsed`  
`lstOutput.Items.Add(milesPerGallon)`  
`End Sub`

```

71. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim waterPerPersonPerDay, people, days, waterUsed As Double
 waterPerPersonPerDay = 1600
 people = 315000000
 days = 365
 waterUsed = waterPerPersonPerDay * people * days
 lstOutput.Items.Add(waterUsed)
End Sub

```



```

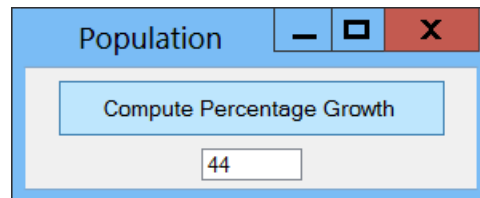
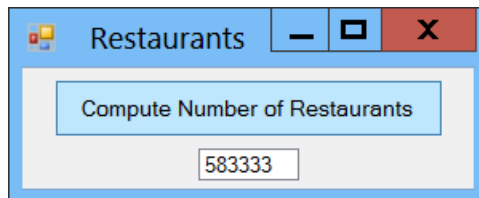
72. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim numPerDay As Integer
 numPerDay = 350 * 60 * 60 * 24
 lstOutput.Items.Add(numPerDay)
End Sub

```

```

73. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim pizzarias, percent, restaurants As Double
 pizzarias = 70000
 percent = 0.12
 restaurants = pizzarias / percent
 lstOutput.Items.Add(Math.Round(restaurants))
End Sub

```



```

74. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim pop2000, pop2050, percentGrowth As Double
 pop2000 = 281
 pop2050 = 404
 percentGrowth = Math.Round(100 * ((pop2050 - pop2000) / pop2000))
 lstOutput.Items.Add(percentGrowth)
End Sub

```

## EXERCISES 3.2

- |                                |                          |          |         |
|--------------------------------|--------------------------|----------|---------|
| 1. Visual Basic                | 2. Hello                 | 3. Ernie | 4. Bert |
| 5. flute                       | 6. acute                 | 7. 123   | 8. 8    |
| 9. Your age is 21.             | 10. Fred has 2 children. |          |         |
| 11. A ROSE IS A ROSE IS A ROSE | 12. 76 trombones         |          |         |

13. 5.5                      14. 3                      15. goodbye                      16. eighth
17. WALLAWALLA                      18. murmur
19. ABC                      20. 8 ball                      21. 12                      22. 9  
     2                                      -1                                      MUNICIPALITY                      microsoft  
     4                                      5                                      city                                      os  
     55 mph                      evolutionary                      6                                      5  
     STU                                      10
23. 8 (0 through 7)                      24. 7                      25. True                      26. True

27. The variable *phoneNumber* should be declared as type String, not Double.

28. The sentence in the second line should be surrounded by quotation marks.

29. *End* is a keyword and cannot be used as a variable name.

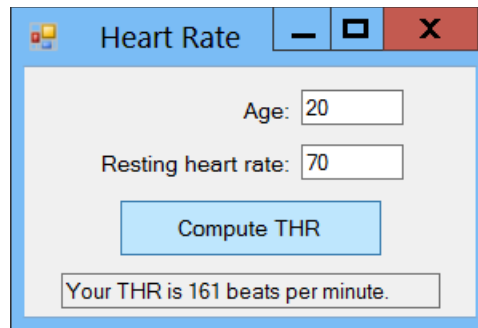
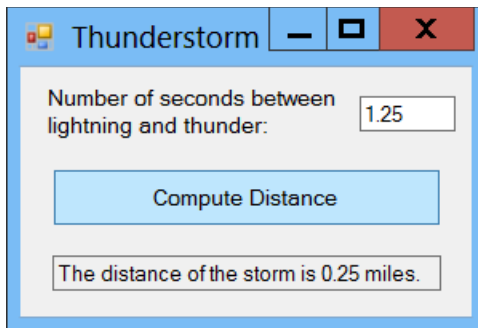
30. *txtBox* should be changed to *txtBox.Text*.

31. The *IndexOf* method cannot be applied to a number, only a string.

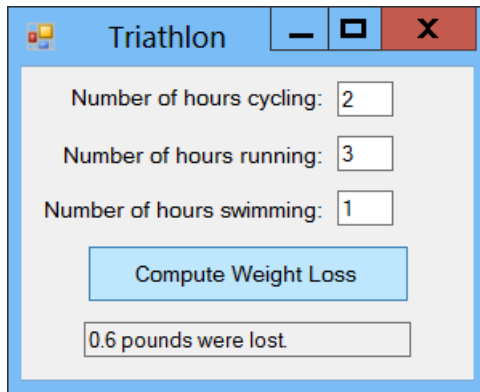
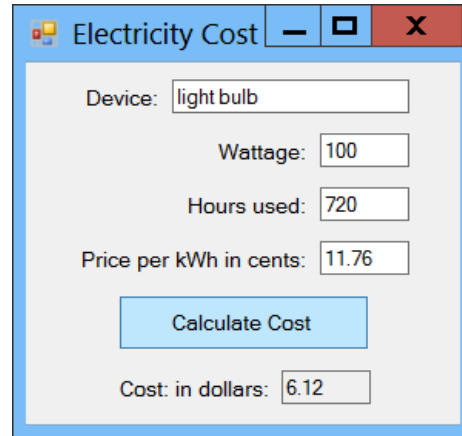
32. A number does not have a *Length* property, only a String has a *Length* property.

- ```
33. Private Sub btnDisplay_Click(...) Handles btnDisplay.Click
    Dim firstName, middleName, lastName As String
    Dim yearOfBirth As Integer
    firstName = "Thomas"
    middleName = "Alva"
    lastName = "Edison"
    yearOfBirth = 1847
    txtOutput.Text = firstName & " " & middleName & " " & lastName &
        ", " & yearOfBirth
End Sub
```
- ```
34. Private Sub btnDisplay_Click(...) Handles btnDisplay.Click
 Dim item As String, regularPrice, discount As Double
 item = "ketchup"
 regularPrice = 1.8
 discount = 0.27
 txtOutput.Text = (regularPrice - discount) & " is the sale price of " &
 item & "."
End Sub
```
- ```
35. Private Sub btnDisplay_Click(...) Handles btnDisplay.Click
    Dim publisher As String
    publisher = "Pearson"
    txtOutput.Text = "(c) " & publisher
End Sub
```

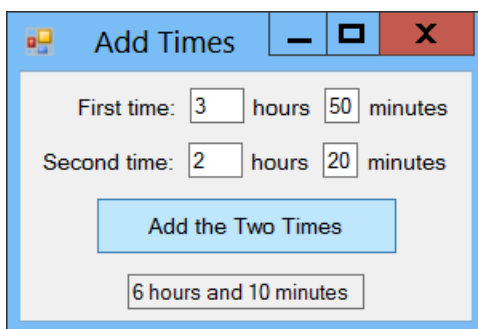
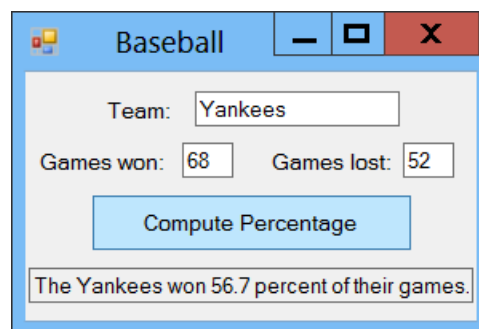
36. Private Sub btnDisplay_Click(...) Handles btnDisplay.Click
 Dim prefix As String
 prefix = "Fore"
 txtOutput.Text = prefix & "warned is " & prefix & "armed."
 End Sub
37. Dim str As String 'Place in the Declarations section of the program
38. Dim str As String 'Place near the top of the event procedure
39. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim distance As Double
 distance = CDbl(txtNumSec.Text) / 5
 distance = Math.Round(distance, 2)
 txtOutput.Text = "The distance of the storm is " & distance & " miles."
 End Sub



40. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim thr, age, rhr As Double
 age = CDbl(txtAge.Text)
 rhr = CDbl(txtRestHR.Text)
 thr = 0.7 * (220 - age) + 0.3 * rhr
 thr = Math.Round(thr)
 txtTrainHR.Text = "Your THR is " & thr & " beats per minute."
 End Sub
41. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim cycling, running, swimming, pounds As Double
 cycling = CDbl(txtCycle.Text)
 running = CDbl(txtRun.Text)
 swimming = CDbl(txtSwim.Text)
 pounds = (200 * cycling + 475 * running + 275 * swimming) / 3500
 pounds = Math.Round(pounds, 1)
 txtWtLoss.Text = pounds & " pounds were lost."
 End Sub

42. `Private Sub btnCalculate_Click(...) Handles btnCalculate.Click`
`Dim wattage, hours, price, costInCents, costInDollars As Double`
`wattage = CDb1(txtWattage.Text)`
`hours = CDb1(txtHoursUsed.Text)`
`price = CDb1(txtPricePerKWh.Text)`
`costInCents = (wattage * hours) / (10 * price)`
`'cost = (wattage * hours) / (1000 * price)`
`costInDollars = Math.Round(costInCents) / 100`
`txtCost.Text = CStr(costInDollars)`
`End Sub`
43. `Private Sub btnAdd_Click(...) Handles btnAdd.Click`
`Dim hr1, hr2, min1, min2, totalMinutes, totalHours As Integer`
`hr1 = CInt(txtHours1.Text)`
`hr2 = CInt(txtHours2.Text)`
`min1 = CInt(txtMin1.Text)`
`min2 = CInt(txtMin2.Text)`
`totalMinutes = (min1 + min2) Mod 60`
`totalHours = hr1 + hr2 + ((min1 + min2) \ 60)`
`txtSum.Text = totalHours & " hours and " & totalMinutes & " minutes"`
`End Sub`

44. `Private Sub btnCompute_Click(...) Handles btnCompute.Click`
`Dim numberOfGames As Integer`
`Dim percent, percentage As Double`
`numberOfGames = CInt(txtWon.Text) + CInt(txtLost.Text)`
`percent = CDb1(txtWon.Text) / numberOfGames`
`percentage = 100 * Math.Round(percent, 5)`
`txtPercent.Text = "The " & txtTeam.Text & " won " & percentage &`
`" percent of their games."`
`End Sub`

45. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim revenue, expenses, income As Double
 revenue = CDb1(txtRevenue.Text)
 expenses = CDb1(txtExpenses.Text)
 income = revenue - expenses
 txtNetIncome.Text = CStr(income)
End Sub

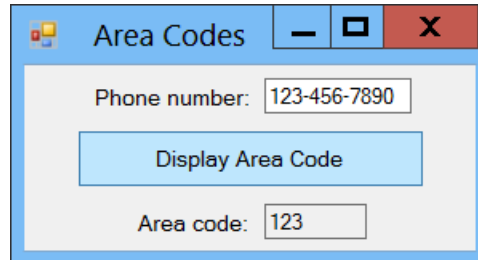
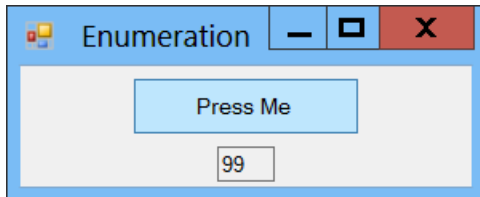
46. Private Sub btnCompute_Click(...) Handles btnCompute.Click
 Dim per As Double
 per = CDb1(txtPrice.Text) / CDb1(txtEarnings.Text)
 txtPER.Text = CStr(per)
End Sub

47. Private Sub btnDisplay_Click(...) Handles btnDisplay.Click
 Dim speed, distance As Double
 distance = CDb1(txtDistanceSkidded.Text)
 speed = Math.Sqrt(24 * distance)
 speed = Math.Round(speed, 2)
 txtEstimatedSpeed.Text = speed & " mph"
End Sub

48. Private Sub btnConvert_Click(...) Handles btnConvert.Click
 Dim per As String, num As Double
 per = txtPercent.Text
 per = per.Substring(0, per.Length - 1)
 num = CDb1(per) / 100
 txtNumber.Text = CStr(num)
End Sub

49. `Dim number As Integer = 100` 'in Declarations section

```
Private Sub btnPressMe_Click(...) Handles btnPressMe.Click
    number = number - 1 'decrease number by 1
    txtOutput.Text = CStr(number)
End Sub
```

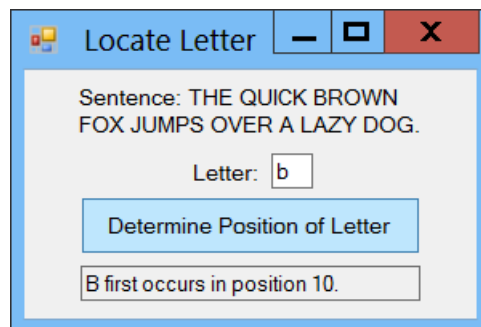
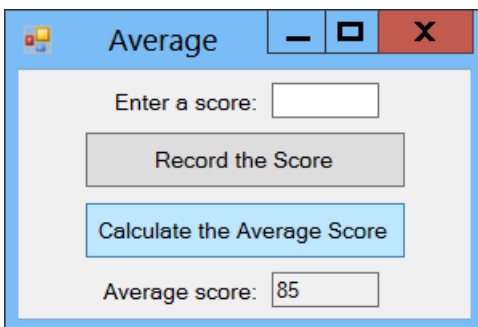


50. `Private Sub btnDisplay_Click(...) Handles btnDisplay.Click`
`Dim phoneNumber As String`
`phoneNumber = txtPhoneNumber.Text`
`txtAreaCode.Text = phoneNumber.Substring(0, 3)`
`End Sub`

51. `Dim sum As Double` 'sum of the scores entered
`Dim num As Integer` 'number of scores entered

```
Private Sub btnRecord_Click(...) Handles btnRecord.Click
    num += 1
    sum += Cdbl(txtScore.Text)
    txtScore.Clear()
    txtScore.Focus()
End Sub
```

```
Private Sub btnCalculate_Click(...) Handles btnCalculate.Click
    txtAverage.Text = CStr(sum / num)
End Sub
```



52. `Private Sub btnDetermine_Click(...) Handles btnDetermine.Click`
`Dim sentence = "THE QUICK BROWN FOX JUMPS OVER A LAZY DOG"`
`Dim letter As String, position As Integer`
`letter = txtLetter.Text.ToUpper`
`position = sentence.IndexOf(letter)`
`txtOutput.Text = letter & " first occurs in position " & position & "."`
`End Sub`

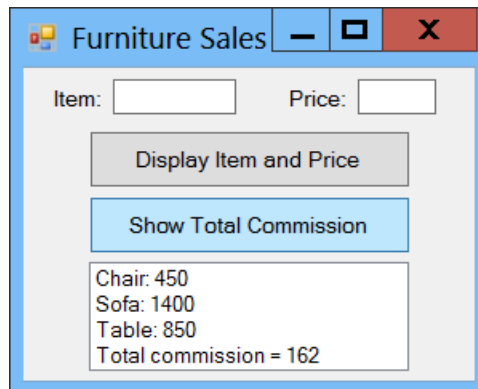
56. Dim totalSales As Double

```

Private Sub btnDisplay_Click(...) Handles btnDisplay.Click
    lstOutput.Items.Add(txtItem.Text & ": " & txtPrice.Text)
    totalSales += Cdbl(txtPrice.Text)
    txtItem.Clear()
    txtPrice.Clear()
    txtItem.Focus()
End Sub

Private Sub btnShow_Click(...) Handles btnShow.Click
    lstOutput.Items.Add("Total commission = " & (0.06 * totalSales))
End Sub

```



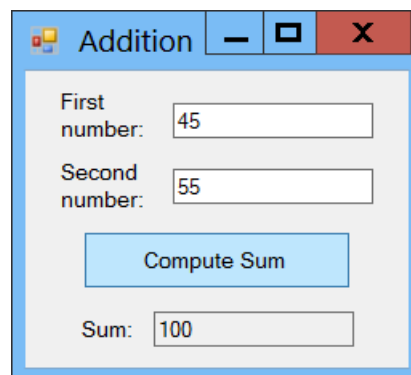
57. Private Sub btnCompute_Click(...) Handles btnCompute.Click

```

Dim num1, num2, sum As Double
num1 = Cdbl(txtFirstNum.Text)
num2 = Cdbl(txtSecondNum.Text)
sum = num1 + num2
txtSum.Text = CStr(sum)
End Sub

Private Sub txtEitherNum_TextChanged(...) Handles _
    txtFirstNum.TextChanged, txtSecondNum.TextChanged
    txtSum.Clear()
End Sub

```



```

58. Private Sub btnCalculate_Click(...) Handles btnCalculate.Click
    Dim principal, interestRate, balance As Double
    Dim numYears As Integer
    principal = CDb1(txtPrincipal.Text)
    interestRate = CDb1(txtInterest.Text)
    numYears = CInt(txtYears.Text)
    balance = principal * (1 + interestRate / 100) ^ numYears
    txtBalance.Text = balance.ToString("C")
End Sub

```

Future Value

Principal: 1000

Interest rate (%): 5

Number of years: 3

Calculate Future Value

Future value: \$1,157.63

Present Value

Future value: 10000

Interest rate (%): 4

Number of years: 6

Calculate Present Value

Present value: \$7,903.15

```

59. Private Sub btnCalculate_Click(...) Handles btnCalculate.Click
    Dim futureValue, interestRate, presentValue As Double
    Dim numYears As Integer
    futureValue = CDb1(txtFutureValue.Text)
    interestRate = CDb1(txtInterest.Text)
    numYears = CInt(txtYears.Text)
    presentValue = futureValue / (1 + interestRate / 100) ^ numYears
    txtPresentValue.Text = CStr(Math.Round(presentValue, 2))
End Sub

```

```

60. Private Sub btnConvert_Click(...) Handles btnConvert.Click
    Dim numMonths As Integer = CInt(txtMonths.Text)
    Dim years As Integer = numMonths \ 12
    Dim remainingMonths = numMonths Mod 12
    txtAnswer.Text = years.ToString("N0") & " years and " &
        remainingMonths & " months"
End Sub

```

```

61. Private Sub btnConvert_Click(...) Handles btnConvert.Click
    Dim feet, inches As Integer
    inches = CInt(txtInches.Text)
    feet = inches \ 12
    inches = inches Mod 12
    txtFeetAndInches.Text = feet & " feet and " & inches & " inches"
End Sub

```

EXERCISES 3.3

1. 1,235 2. -12.346 3. 1,234.0 4. 12,345.00
5. 0.0 6. 0.1 7. -0.67 8. 1.20 9. 12,346.000 10. 12
11. 12 12. \$1,234.50 13. \$12,346 14. (\$1,234,567.00)
15. (\$0.23) 16. \$3,200.00 17. \$0.80 18. 4%
19. \$0.08 20. -5.000 % 21. 100.00 % 22. 1.00 %
23. 66.67 % 24. 75.0 %
25. Pay to France \$27,267,622.00 26. Manhattan was purchased for \$24.00
27. 25.6% of the U.S. population 25+ years old are college graduates.
28. 1,711,500 degrees were conferred.
29. The likelihood of Heads is 50% 30. Pi = 3.1416
31. 10/23/2012 32. Sunday, June 15, 2014
33. Thursday, November 28, 2013 34. 1/1/2012
35. 10/2/2014 36. 2/9/2013 37. 4/5/2016 38. 11/2/2012
39. 29 40. 366 41. 5 42. 2

43. 1

44. 2013

45. 2015

46. 3

47. You might win 360 dollars. 48. Untied 49. Hello John Jones

50. At the current interest rate, money will double in 18 years.

51. \$106.00 52. You owe \$900,000.00 in estate taxes.

53. The statement `n += 1` is not valid since the value of a named constant cannot be changed.

54. The statement `n = n.ToUpper` is not valid since the value of a constant cannot be changed.

55. The second line should use CDBl to convert the right-hand side to type Double.

56. There needs to be a string inside the `InputBox()` call (i.e., the "Prompt" argument is required).

57. `(123456).ToString("N")` is a string and therefore cannot be assigned to a numeric variable.

58. Must remove the dollar sign.

59. You must insert `.Show` after the word `MessageBox`.

60. 1776 should be surrounded with quote marks

61. 000

62. LLLLLLLLLL

63. LLL000

64. 0LLL000

65. 0-00-000000-&

66. LL

```
67. MessageBox.Show("First solve the problem. Then write the code.",  
                    "Good Advice")
```

```
68. MessageBox.Show("You can't steal second base and keep one foot on first.",  
                  "Taking Risks Proverb")
```

```
69. Private Sub btnDisplay_Click(...) Handles btnDisplay.Click
    Dim begOfYearCost, endOfYearCost As Double
    Dim percentIncrease As Double
    begOfYearCost = 200
    endOfYearCost = CDbl(TextBox1.Text)
    percentIncrease = (endOfYearCost - begOfYearCost) / begOfYearCost
    txtOutput.Text = "The increase in cost for the year is " &
        percentIncrease.ToString("P") & "."
End Sub
```

```
70. Private Sub btnDisplayReport_Click(..) Handles btnDisplayReport.Click
    'Report the amount of money raised in a walk-a-thon
    Dim pledge, miles As Double
    pledge = CDb1(InputBox("Enter amount pledged per mile:", "Walk-A-Thon"))
    miles = CDb1(InputBox("Enter number of miles walked:", "Walk-A-Thon"))
    txtReport.Text = "Collect " & (pledge * miles).ToString("C") &
        " from this sponsor."
End Sub
```

71. `Private Sub txtPhoneNumber_Enter(...) Handles txtPhoneNumber.Enter`
`MessageBox.Show("Be sure to include the area code!", "Reminder")`
`End Sub`

A screenshot of a Windows form titled "Reminder". It has a standard Windows title bar with minimize, maximize, and close buttons. The form contains two text boxes: one labeled "Name:" and another labeled "Phone number:".

A screenshot of a Windows form titled "Independence". It has a standard Windows title bar. The form contains a button labeled "Calculate Number of Days" and a text box below it displaying the value "86,319".

72. `Private Sub btnCalculate_Click(...) Handles btnCalculate.Click`
`Dim dateDOC As Date = #7/4/1776#`
`Dim numDays As Double = DateDiff(DateInterval.Day, dateDOC, Today)`
`txtNumDays.Text = numDays.ToString("N0")`
`End Sub`
73. `Private Sub btnDisplay_Click(...) Handles btnDisplay.Click`
`Dim firstDayOfYr, firstDayOfNextYr As Date`
`Dim numDays As Double`
`firstDayOfYr = CDate("1/1/" & mtbYear.Text)`
`firstDayOfNextYr = firstDayOfYr.AddYears(1)`
`numDays = DateDiff(DateInterval.Day, firstDayOfYr, firstDayOfNextYr)`
`txtNumDays.Text = CStr(numDays)`
`End Sub`

A screenshot of a Windows form titled "Length of Year". It has a standard Windows title bar. The form contains a text box labeled "Year:" with the value "2014", a button labeled "Display Number of Days", and a text box labeled "Number of days:" with the value "365".

A screenshot of a Windows form titled "Day of Week". It has a standard Windows title bar. The form contains a text box labeled "Date:" with the value "04/25/2014", a button labeled "Determine Day of Week", and a text box labeled "Day of week:" with the value "Friday".

74. `Private Sub Determine_Click(...) Handles btnDetermine.Click`
`Dim dt As Date = CDate(mtbDate.Text)`
`Dim fullDate As String = dt.ToString("D")`
`Dim position As Integer = fullDate.IndexOf(",")`
`Dim dayOfWeek As String = fullDate.Substring(0, position)`
`txtDayOfWeek.Text = dayOfWeek`
`End Sub`
75. `Private Sub Determine_Click(...) Handles btnDetermine.Click`
`Dim dt As Date = CDate(mtbDate.Text)`
`Dim laterDate = dt.AddYears(10)`
`Dim fullDate As String = laterDate.ToString("D")`
`Dim position As Integer = fullDate.IndexOf(",")`
`Dim dayOfWeek As String = fullDate.Substring(0, position)`
`txtDayOfWeek.Text = dayOfWeek`
`End Sub`

- ```

76. Private Sub Determine_Click(...) Handles btnDetermine.Click
 Dim dt As Date = CDate(mtbDate.Text)
 Dim turn21Date = dt.AddYears(21)
 Dim fullDate As String = turn21Date.ToString("D")
 Dim position As Integer = fullDate.IndexOf(",")
 Dim dayOfWeek As String = fullDate.Substring(0, position)
 txtDayOfWeek.Text = dayOfWeek
End Sub

77. Private Sub btnConvert_Click(...) Handles btnConvert.Click
 Dim dt As Date
 dt = CDate(txtUS.Text)
 txtEurope.Text = dt.Day & "/" & dt.Month & "/" & dt.Year
End Sub

```

- ```

78. Private Sub btnWhen_Click(...) Handles btnWhen.Click
    Dim yr As String
    Dim dt As Date
    yr = txtYear.Text
    dt = CDate("2/14/" & yr)
    txtDate.Text = dt.ToString("D")
End Sub

79. Private Sub Determine_Click(...) Handles btnDetermine.Click
    Dim month, yr As Integer 'month given as 1 through 12
    Dim dt, dt2 As Date
    Dim numDays As Double
    month = CInt(txtMonth.Text)
    yr = CInt(mtbYear.Text)
    dt = CDate(month & "/1/" & yr)
    dt2 = dt.AddMonths(1)
    numDays = DateDiff(DateInterval.Day, dt, dt2)
    txtNumDays.Text = CStr(numDays)
End Sub

```

```

80. Private Sub btnCompute_Click(...) Handles btnCompute.Click
    Dim dob As Date = CDate(mtbDayOfBirth.Text)
    Dim ageOnEarthInDays, ageOnMercuryInYears As Double
    txtToday.Text = Today.ToString("d")
    ageOnEarthInDays = DateDiff(DateInterval.Day, dob, Today)
    ageOnMercuryInYears = ageOnEarthInDays / 88
    txtAgeOnMercury.Text = ageOnMercuryInYears.ToString("N1") & " Mercurian years"
End Sub

```

CHAPTER 3 PROGRAMMING PROJECTS

```

1. Private Sub btnAdd_Click(...) Handles btnAdd.Click
    Dim num1 As Double = CDb1(txtFirstNum.Text)
    Dim num2 As Double = CDb1(txtSecondNum.Text)
    txtOutput.Text = num1 & " + " & num2 & " = " & num1 + num2
End Sub

Private Sub btnSubtract_Click(...) Handles btnSubtract.Click
    Dim num1 As Double = CDb1(txtFirstNum.Text)
    Dim num2 As Double = CDb1(txtSecondNum.Text)
    txtOutput.Text = num1 & " - " & num2 & " = " & num1 - num2
End Sub

Private Sub btnMultiply_Click(...) Handles btnMultiply.Click
    Dim num1 As Double = CDb1(txtFirstNum.Text)
    Dim num2 As Double = CDb1(txtSecondNum.Text)
    txtOutput.Text = num1 & " x " & num2 & " = " & (num1 * num2)
End Sub

Private Sub input_TextChanged(...)
    Handles txtFirstNum.TextChanged, txtSecondNum.TextChanged
    txtOutput.Clear()
End Sub

```