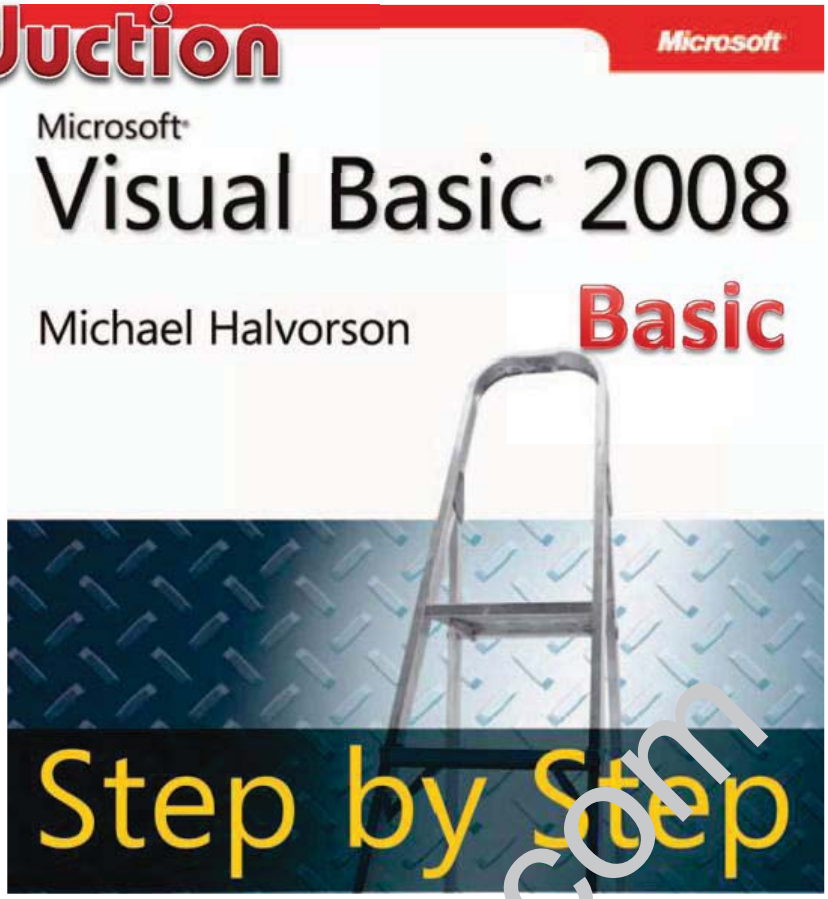
Introduction



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1. Visual Basic គឺជាអ្វី?

- Visual Basic 2008 គឺជា development tool ដែលត្រូវបានប្រែប្រាសដើម្បីបង្កើត Software Application.
- ការប្រែប្រាស់ Visual Basic 2008 គឺយើងអាចធ្វើការបង្កើត Software សំរាប Windows OS.
- សារៈសំខាន់របស់វាគឺជួយបង្កើន development work ឲមានភាពងាយស្រួល និងឆាបរហាស.
- អត្ថប្រយោជន៍មួយទៀតក្នុង Visual Basic 2008 គឺយើងអាចប្រើ development tool ដដែលទៅ សរសេរ Program ជាមួយនឹង Visual C++ 2008, Visual C# 2008,...

2. Visual Basic .NET Version

Version	Name	Year Release
0	Visual Basic 6.0	Sep, 1998
1	Visual Basic .NET 2002	Feb, 2002
2	Visual Basic .NET 2003	Mar, 2003
3	Visual Basic .NET 2005	Late, 2005
4	Visual Basic 2008 (VB.NET 9) (integrated with Visual Studio that it is only available as component in the Visual Studio 2008 programming suite, which includes Visual C#, Visual C++,…	Early, 2008

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Enter 01
Exploring the Visual Studio
Integrated Development Environment

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1. The Visual Studio Development Environment

- នៅក្នុងការសរសេរ program ជាមួយ VB.Net 2008 គឺយើងត្រូវប្រើប្រាស់ Tool ឬ Program មួយគឺ IDE (Integrated Development Environ-ment).
- នៅក្នុង IDE គឺយើងអាចធ្វើសរសេរ program ជាមួយនឹងភាសាមួយចំនួនដូចជា Visual Basic, Visual C++, និង C#

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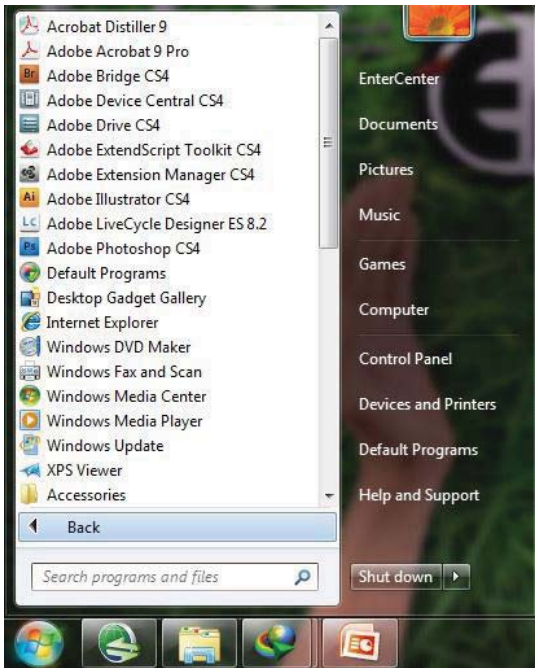
1.1. Start Visual Studio 2008

1. Click Start button >
2. All Programs >
3. Microsoft Visual Studio 2008 Folder >
4. Click Microsoft Visual Studio 2008 Icon.

1.1. Start Visual Studio 2008



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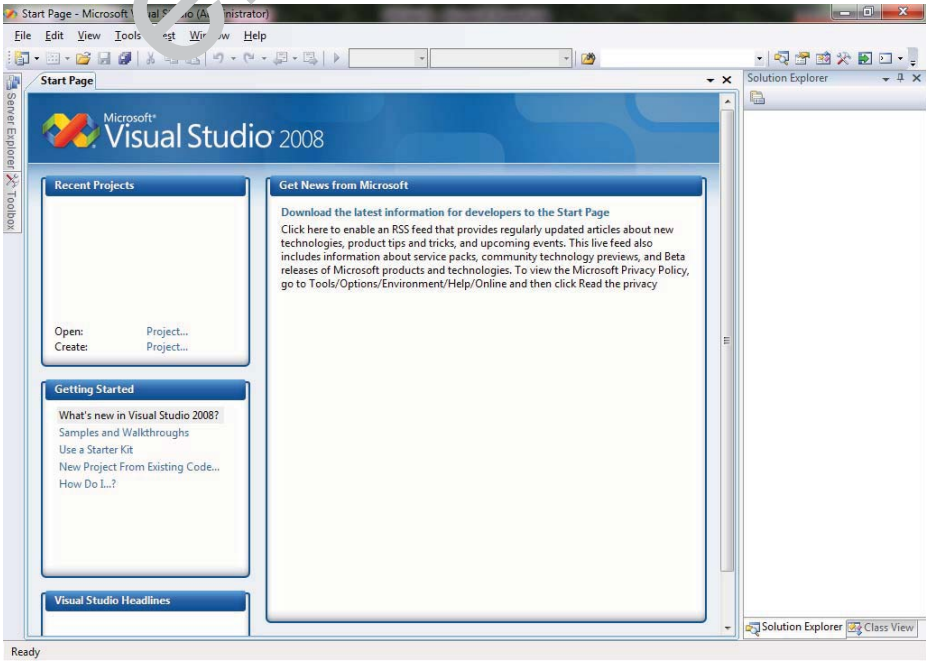
1.1. Start Visual Studio 2008



1.2. Open a Visual Basic Project

1. Click Open Project link >
2. Browse to C:\vb08sbs\chap01 >
3. Double Click on MusicTrivia.sln Solution.

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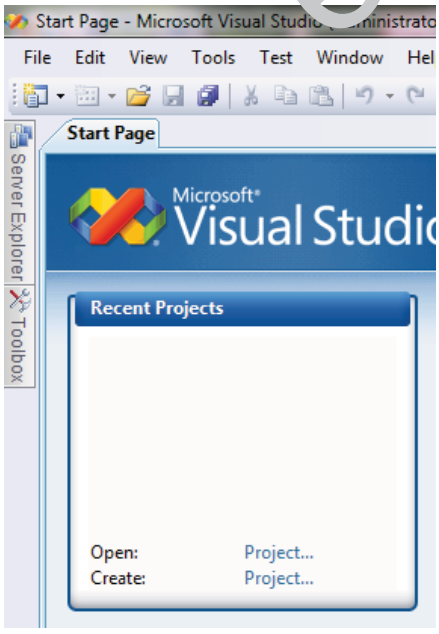
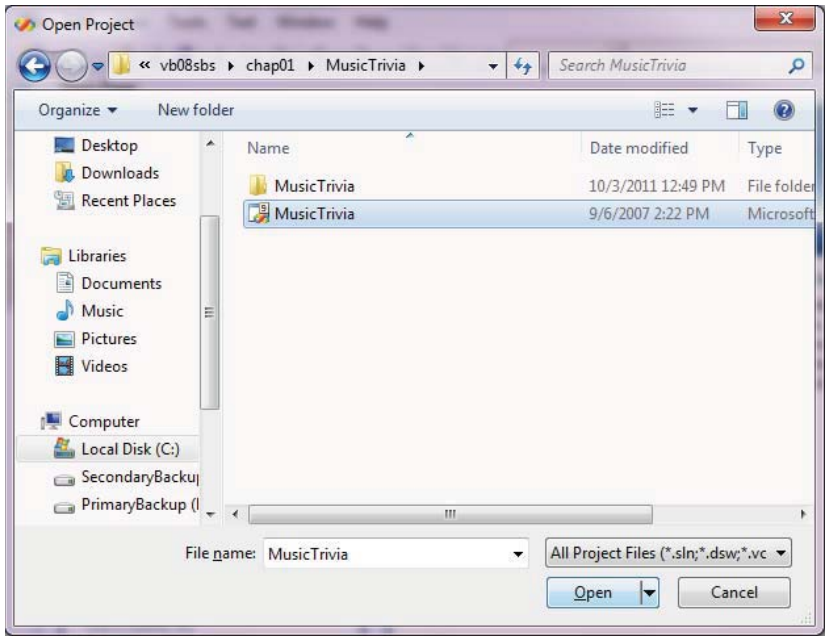
1.2. Open a Visual Basic Project





1.3. Projects and Solutions

- ក្នុង Visual Studio, programs ដែលកំពុងបង្កើតត្រូវបានហៅថា projects, ឬ solutions ពីព្រោះវាផ្គុំកន្លះ components ជាច្រើន មិនមែនតែ file មួយនោះទេ.
- Visual Basic 2008 Program គឺមាន files ដូចជា project file (.vbproj) និង solution file (.sln).
- Project file មាន information លើដៅលើការងារតែមួយ ចំនែក solution គឺគ្រប់គ្រងទៅលើ Projects ច្រើនដែលមានទំនាក់ទំនងគ្នា

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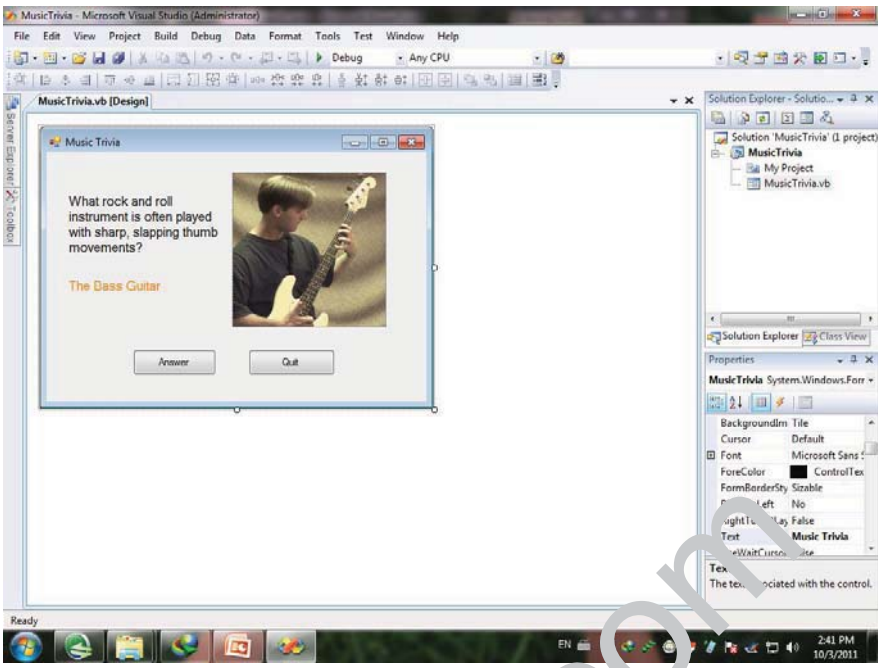
2. Visual Studio Tools

- Tools សំខាន់ៗ ដែលមើលឃើញនៅក្នុង IDE មានដូចជា Designer, Solution Explorer, Properties window, និង Toolbox.

2. Visual Studio Tools



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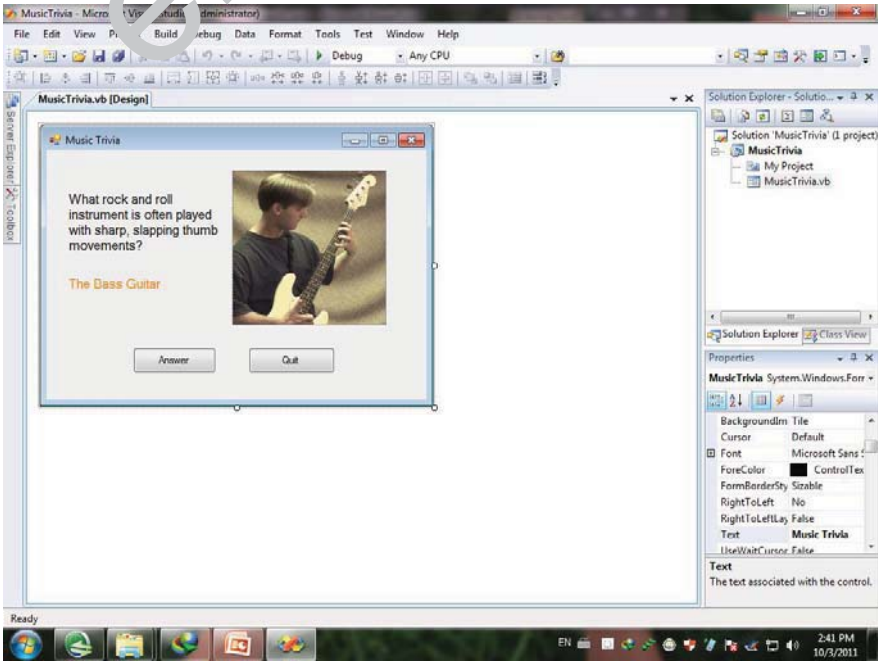
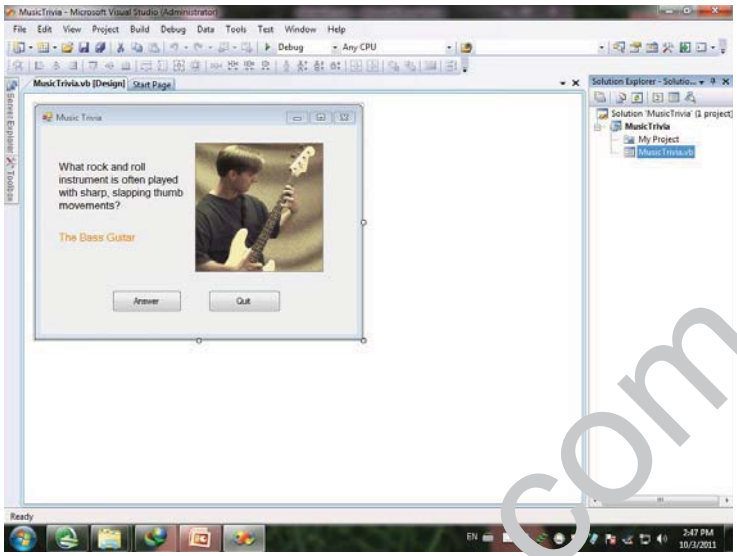
2. Visual Studio Tools



2.1. The Designer

- ផ្ទាំង Designer ត្រូវបានប្រើប្រាស់ដើម្បីធ្វើការបង្កើត និងកែសំរួល program ដែលកំពុងបង្កើត
.



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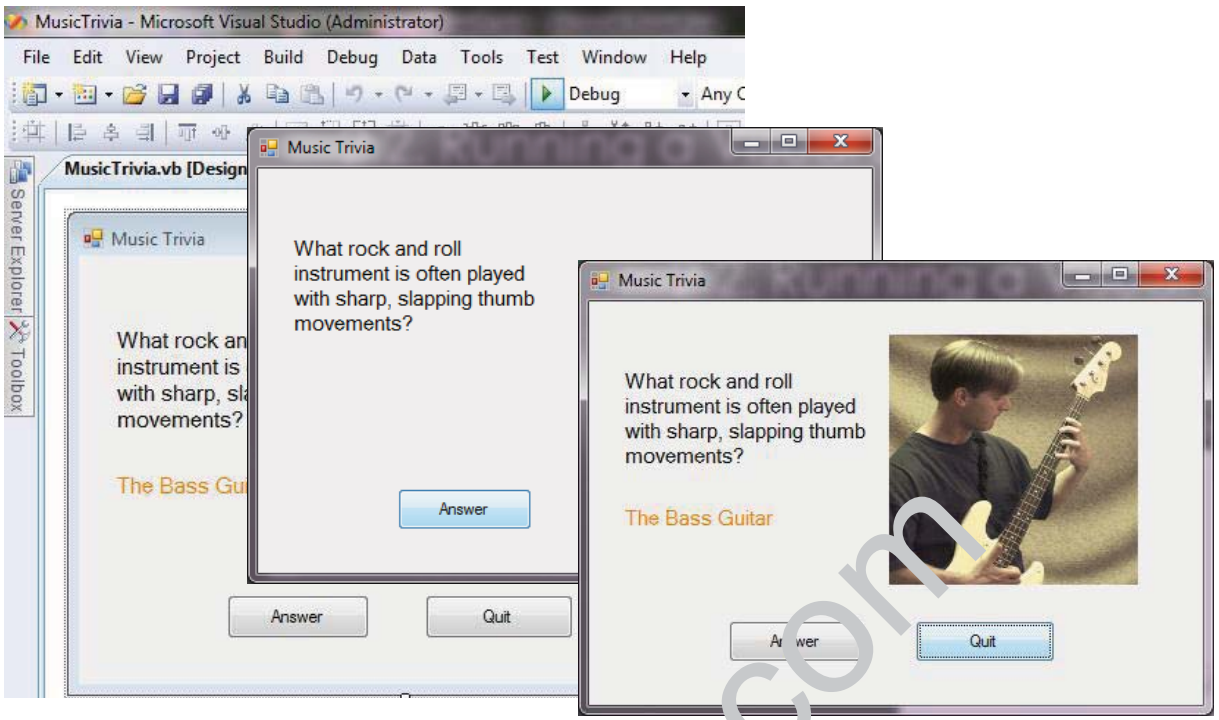
2.2. Running a Visual Basic Program

1. Click Start Debugging button (F5) >
2. Click the Answer button >
3. Click Quit.

2.2. Running a Visual Basic Program



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3. The Properties Window

- ផ្ទាំង Properties Window ត្រូវបានប្រើប្រាស់ដើម្បីធ្វើការកែសំរួល Characteristics, ឬ Properties នៃ user interface elements នៅលើ Form.
- យើងក៏អាចធ្វើការកែសំរួល Properties តាមរយៈ Code Editor បានផងដែរ.
- ដើម្បីកែប្រែ Properties នោះសូមអនុវត្ត:

1. Click Label1 (What rock...) >
2. Click Properties Window button >
3. Click the Font property name >

3. The Properties Window

4. Click Font ellipsis button >
5. Change font style to Italic >
6. Click OK >

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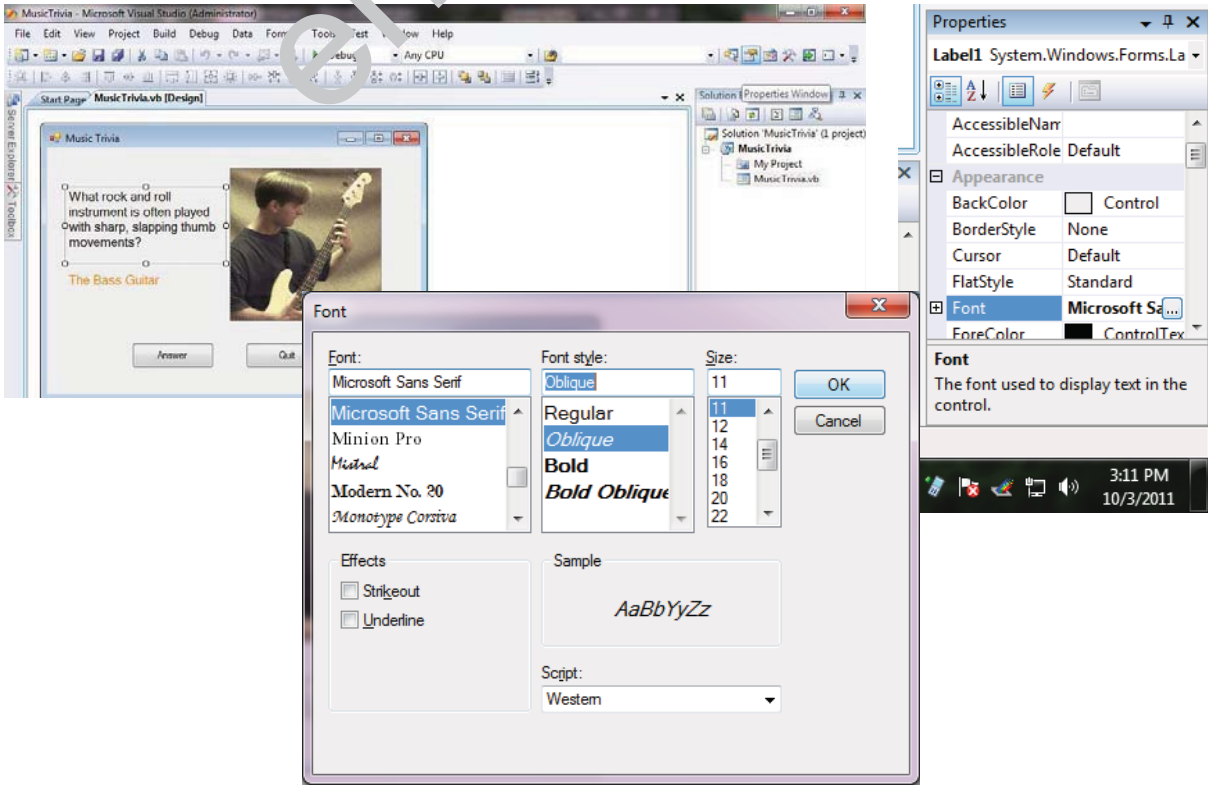
3. The Properties Window



3. The Properties Window

Now change a property for Label2 (The Bass...)

7. Click on Second label object (Label2) >
8. Click Font Properties >
9. Click Font ellipsis button >
10. Set Font style to Bold and size 12 point >
13. Click OK button >
14. Click ForeColor and Change its Color >
15. Click OK.

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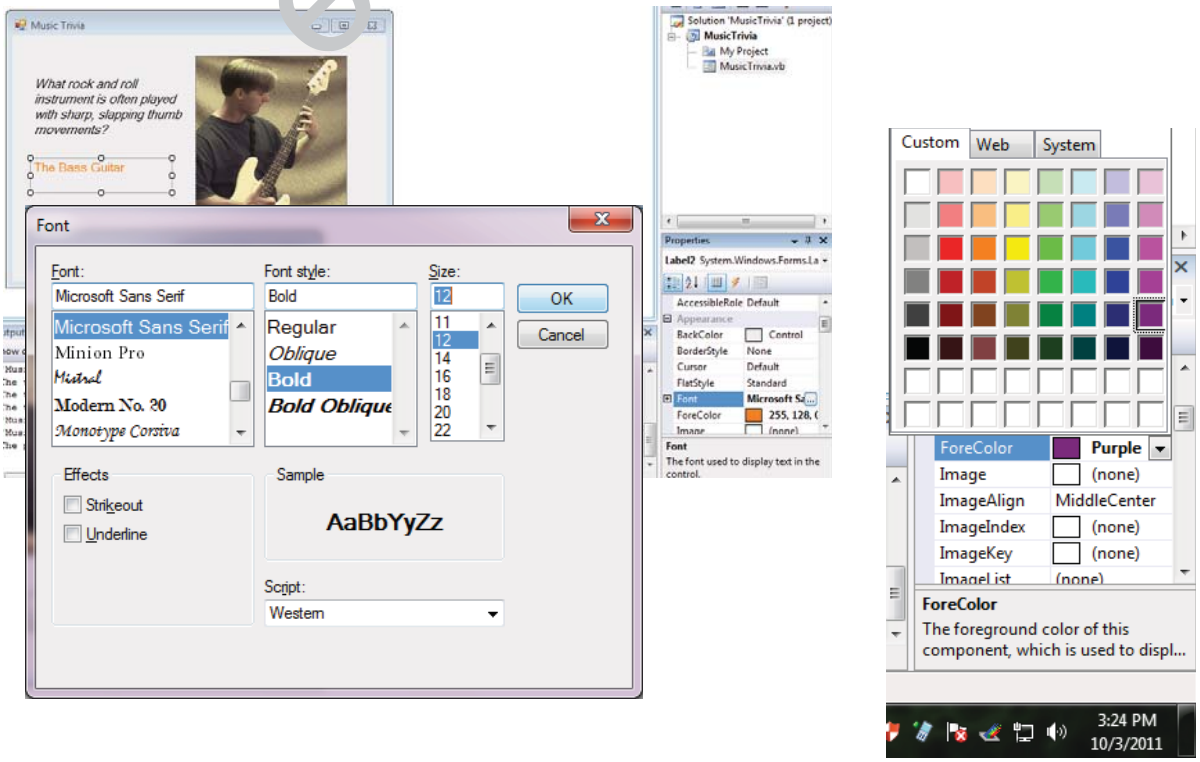
3. The Properties Window



4. Moving and Resizing the Programming Tools

- Visual Studio អាចឲយើង move, resize, dock, and auto hide interface elements.
  - Move tool windows គឺ click ត្រង់ title bar របស់វាហើយទាញទៅកាន់ទីតាំងដែលត្រូវការ
  - Dock tool windows គឺអាចឲយើងតំរៀប tool windows ទៅតាម options ដែលមានស្រាប់
  - ដើម្បីបិទ tool windows សូមចុច X Button
  - ដើម្បីបើក tool windows ចុច View Menu ហើយជ្រើសរើសយក tool ណាមួយដែលត្រូវការ

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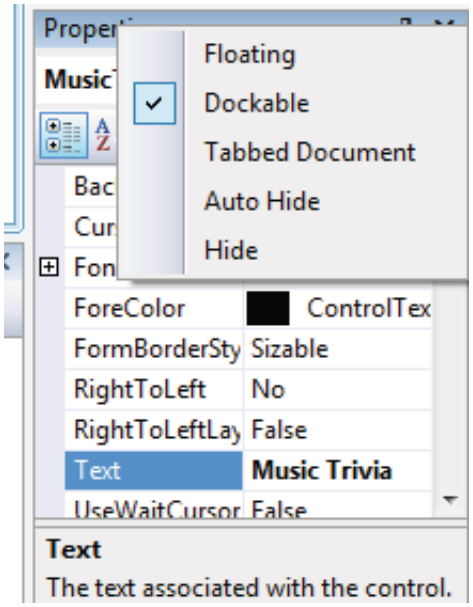
4. Moving and Resizing the Programming Tools

- របៀបផ្សេងទៀតក្នុងការ move, resize, dock:
  - Right click ត្រង់ title :
    - Floating: កំនត់ឲអណ្តែតឡើងលើ
    - Dockable: កំនត់ឲតំរៀបជាប់គ្នា
    - Tabbed Document: កំនត់ទៅជា Tab
    - Auto Hide: លាក់ហើយបង្ហាញវិញ
    - Hide: សំរាប់លាក់ tool window



5. Switching Tools with IDE Navigator

1. To open the IDE Navigator, Hold down the Ctrl key and press tab >
2. While holding down the Ctrl key, press the arrow keys to cycle through >
3. You can also select an open file or tool by clicking its name >
4. When finish release the Ctrl key.
5. or you can also press Alt+F7.

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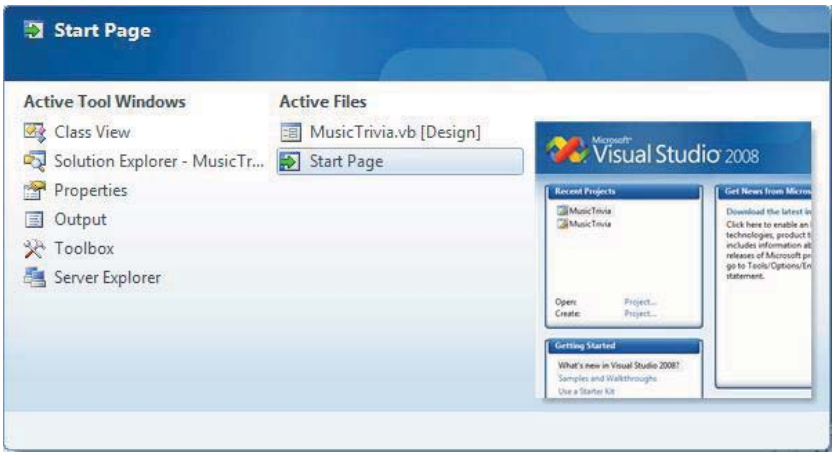
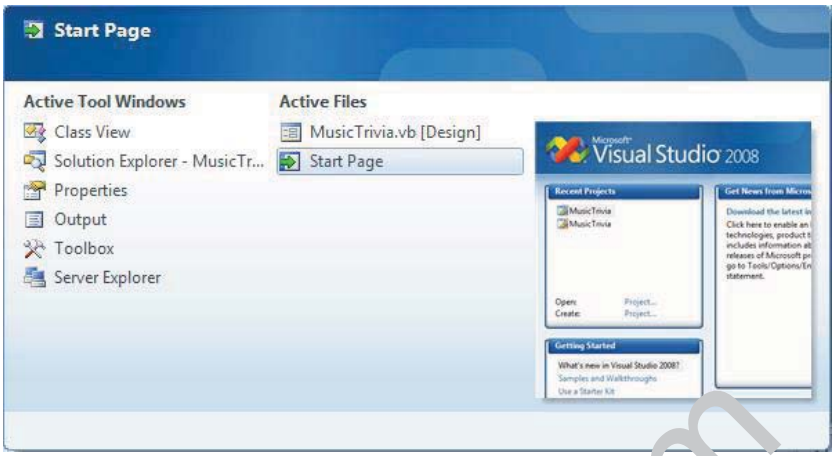
5. Switching Tools with IDE Navigator



5. Switching Tools with IDE Navigator



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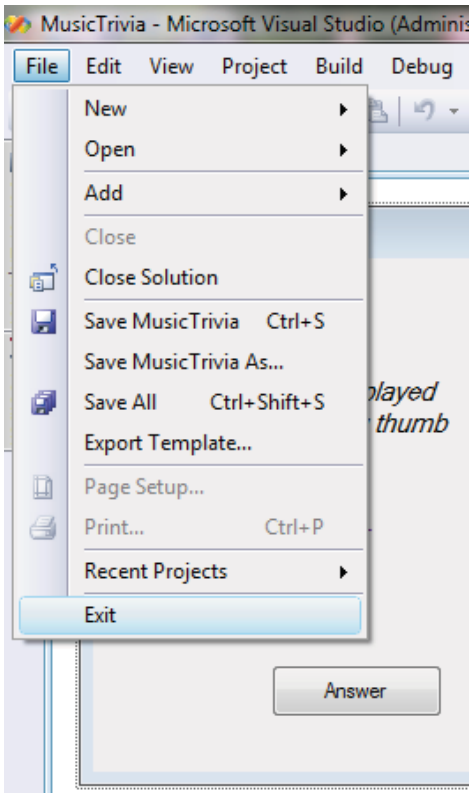
6. Exiting Visual Studio

1. Click Save All button >
2. Click File menu >
3. Click Exit command.



Enter 02
Whiting Your First Program

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1. Lucky Seven Program

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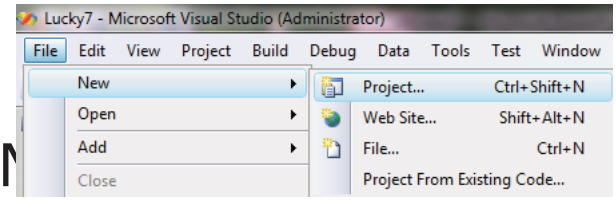
2. Program Step

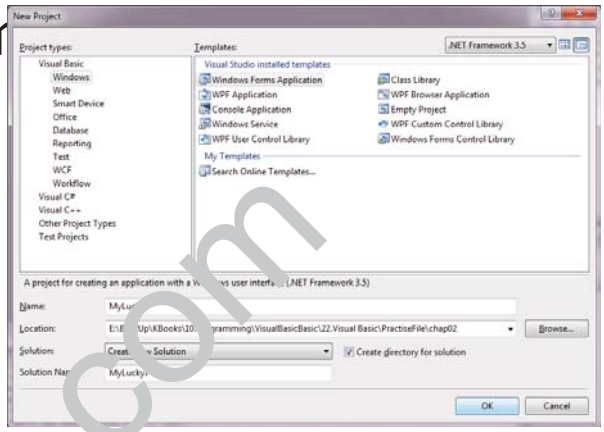
- នៅក្នុង Lucky Seven user interface មាន:
  - Buttons 2
  - Number boxes 3
  - Photo 1 ត្រូវបានបង្ហាញនៅពេលឈ្នះ
  - និង Label “Lucky Seven”.
- ជំហាននីមួយៗក្នុងការបង្កើត:

Program Step	Number of items
1. Create user interface	7 Objects
2. Set the properties	13 properties
3. Write the program code	2 Objects

3. Creating User Interface

1. Start Visual Studio 2008 >
2. Click File Menu >
3. New >
4. Project (Ctrl+Shift+N
5. Select Windows Form Application >
6. Put the name is MyLucky7





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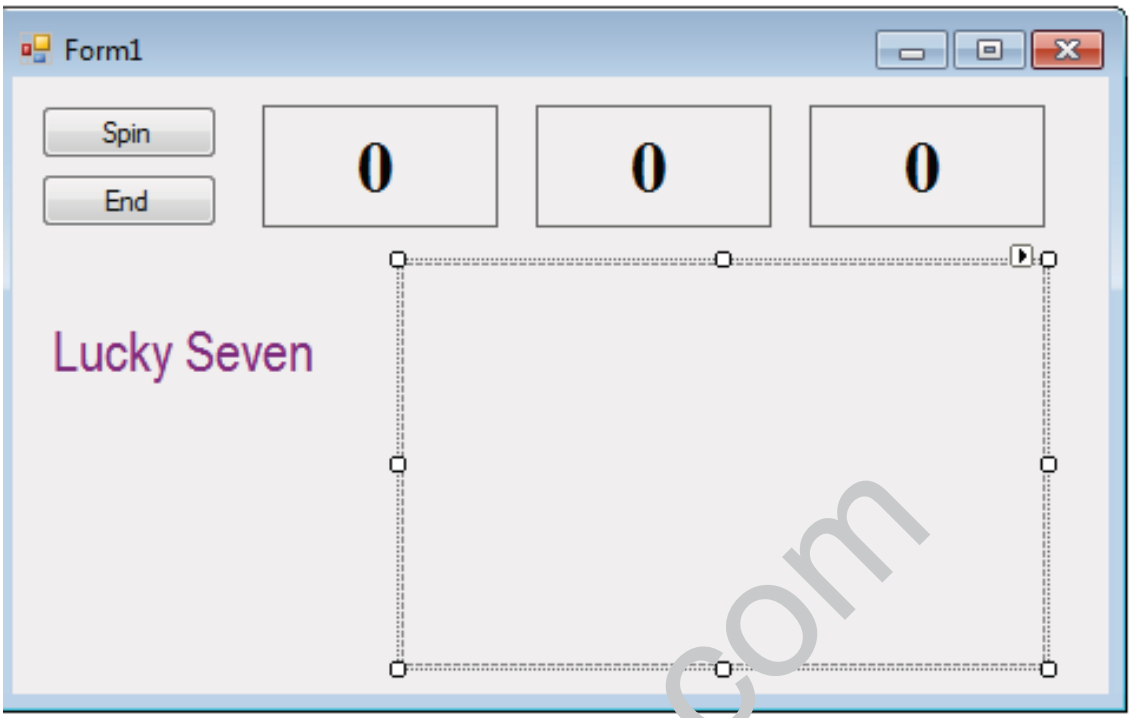
4. Creating Object & it's Properties

Object	Property	Setting
Button1	Text	"Spin"
Button2	Text	"End"
Label1, Label2, Label3	AutoSize BorderStyle Font Text TextAlign	False FixedSingle Times New Roman, Bold, 24-point "0" MiddleCenter
Label4	Text Font ForeColor	"Lucky Seven" Arial, Bold, 18-point Purple
PictureBox1	Image SizeMode Visible	"C:\vb08sbs\chap02\paycoins.jpg" StretchImage False

4. Creating Object & it's Properties



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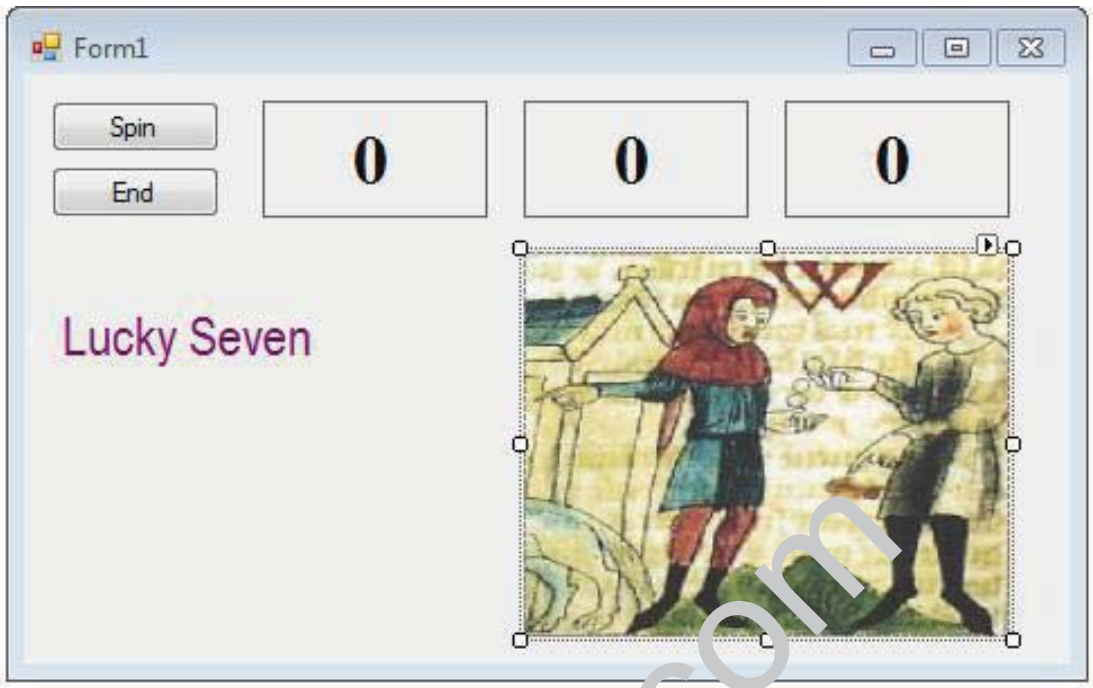
5. Picture Box Properties

1. Click the picture box object on the form >
2. Click the SizeMode property choose StretchImage >
3. Click Image property and click ellipsis button >
4. Click Local Resource option,click Import button >
5. Choose C:\vb08sbs\chap02 folder >
6. Select PayCoins.jpg and Open button >
7. Click OK >
8. Resize the picture box object >
9. In visible property choose False.

5. Picture Box Properties



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6. Writing Code

1. Double Click on the End button >
2. Type End >

```
Public Class Form1

    Private Sub Button2_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button2.Click
        End
    End Sub
End Class
```

3. Double Click on the Spin button >
4. Type the following code.

```
PictureBox1.Visible = False 'hide picture
Label1.Text = CStr(Int(Rnd() * 10)) 'pick number
Label2.Text = CStr(Int(Rnd() * 10))
Label3.Text = CStr(Int(Rnd() * 10))
'if any number is 7 display picture and beep
If (Label1.Text = "7") Or (Label2.Text = "7") _
Or (Label3.Text = "7") Then
    PictureBox1.Visible = True
    Beep()
End If
```

7. Button1_Click Procedure

- Button1_Click procedure ធ្វើការងារ 3 ដូចជា:
  1. វាលាក់រូបថតដែលនៅលើ Form
  2. បង្កើតលេខ random ក្នុង Labels ទាំងបី
  3. វានឹងបង្ហាញរូបភាពនៅពេល Label ណាមួយមានលេខ 7

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7. Button1_Click Procedure

Example	
Label1.Text = CStr(Int(Rnd()*10))	
Code	Result
Rnd()	0.7055475 [0.001-0.999]
Rnd()* 10	7.055475 [1.001-9.999]
Int(Rnd()*10)	7
CStr(Int(Rnd()*10))	“7”
Label1.Text = CStr(Int(Rnd()*10))	7

8. Running Applications

1. Click Debug menu and Start Debugging.
2. Click Start Debugging button on Standard toolbar.
3. Press F5.

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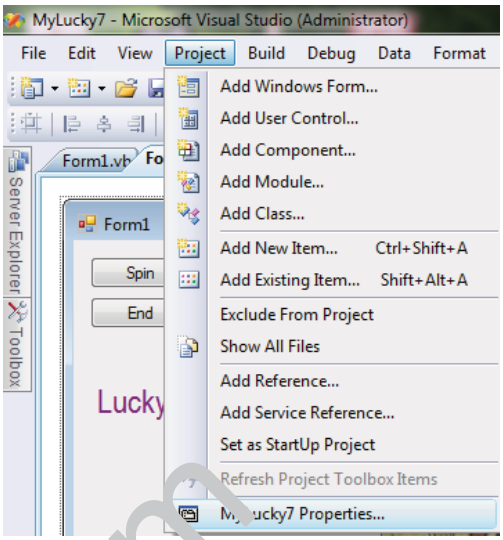
9. Building Executable File

- Visual Studio បានបង្កើត executable file ដោយបែងចែកជាពីរប្រភេទគឺ Debug build និង release build.
- Debug build បង្កើតនៅពេលយើងបង្កើតនិង Test Program, វា store ក្នុង bin\debug
- Release builds គឺជា executable file សំរាប់ប្រើប្រាស់ហើយស្ថិតនៅក្នុង bin\release

9. Building Executable File

1. Click Project >
2. MyLucky7 Properties >



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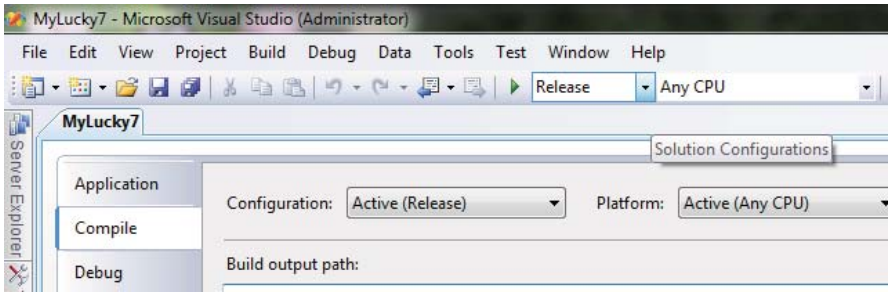
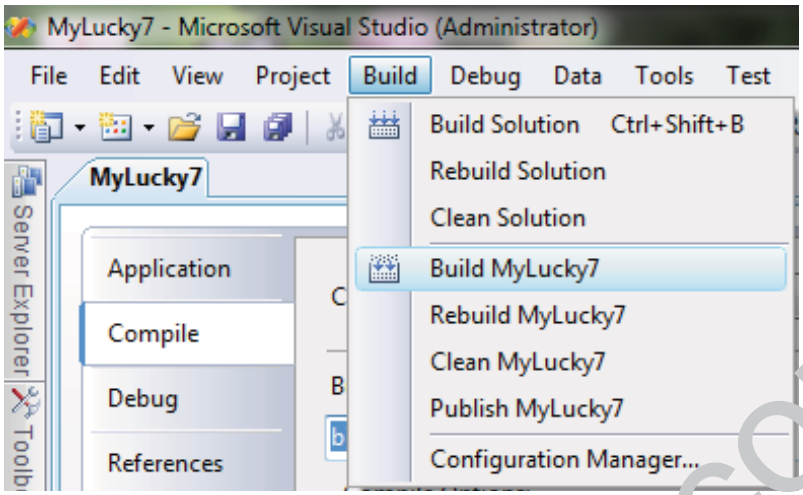
9. Building Executable File

3. On Standard Toolbar choose Release >
4. Start Debugging >



9. Building Executable File

7. Click Build Menu >
8. Build MyLucky7 >



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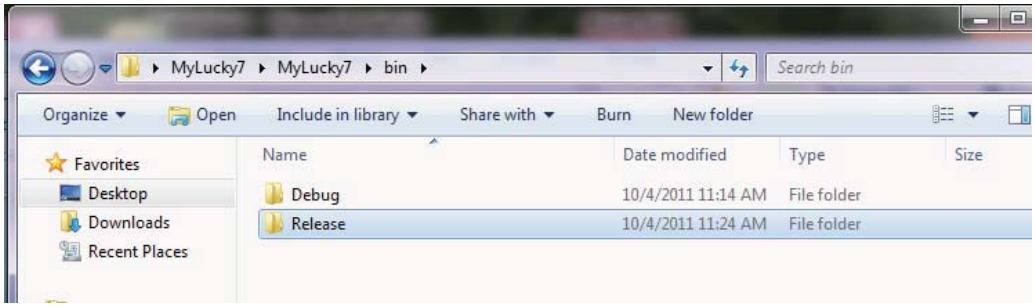
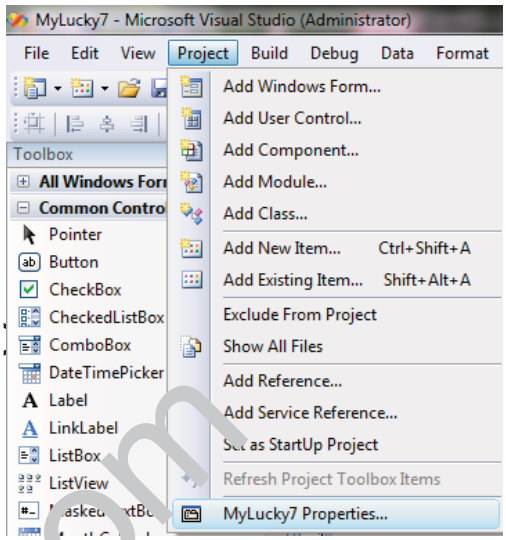
9. Building Executable File

9. The Release Folder appeared in bin Folder



10. Put Icon to Application

1. Create a picture to icon picture with various software >
2. Click Project Menu >
3. MyLucky7 Properties >
4. Click Application Tab >
5. In Icon choose Browse >



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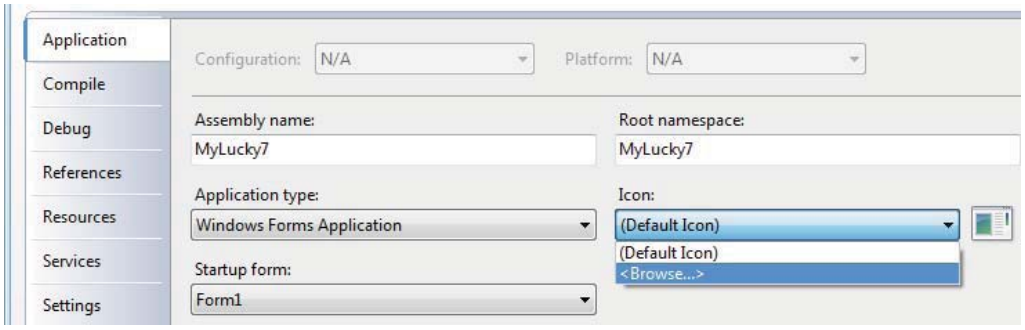
10. Put Icon to Application

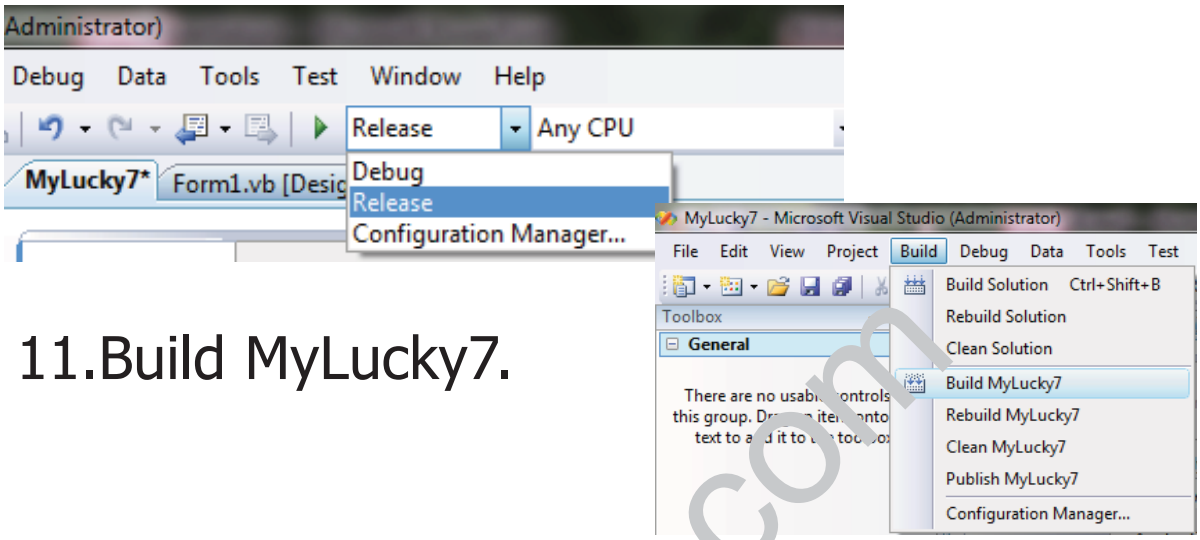
6. Click Application Tab >
7. In Icon choose Browse >



8. Open Icon File >

10. Put Icon to Application

9. Choose Debug or Release >
10. Click Build Menu >



11. Build MyLucky7.

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11. Adding to a Program

1. Double Click on Form to display Form_Load procedure >
2. Type Randomize and Press Enter.

```
Private Sub Form1_Load(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles MyBase.Load
    Randomize()
End Sub
```

Enter 03
Working with Toolbox Controls

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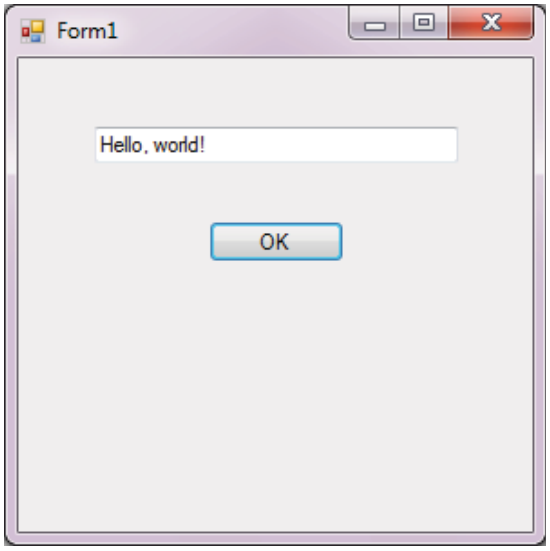
1. Hello World Program



Object	Property	Setting
TextBox1	(No)	(Nc
Button1	Text	OK

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1. Hello World Program

1. Create Solution give its name MyHello >
2. Choose Textbox in Toolbox and draw it in Form >
3. Choose Button and draw it too >
4. Double Click on Button1 and code it
5. TextBox1.Text = "Hello, world!"

1. Hello World Program

```
Language = textbox1.text
Language = language.Toupper

If language = “OK” Or Language=“YES” then
Msgbox(“----”)
End
Else
msgbox(---)
Textbox1.focus()
Textbox1.selectAll()
Textbox1.clear()
```

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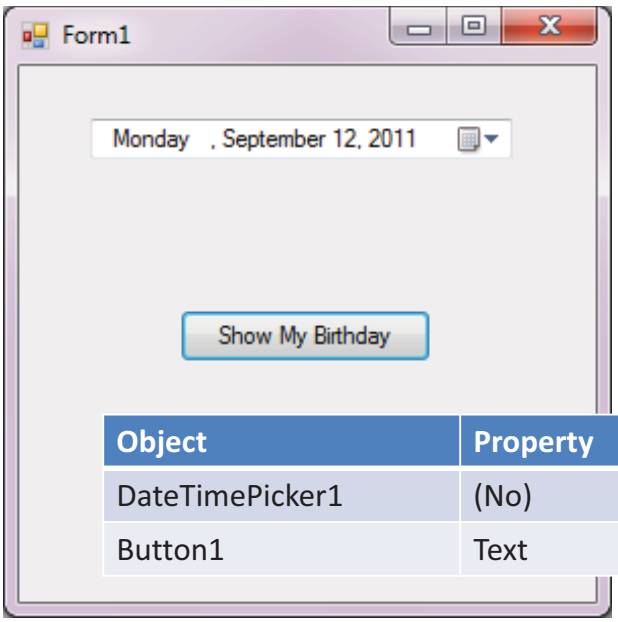
2. DateTimePicker Control

- To create Birthday Program



Object	Property	Setting
DateTimePicker1	(No)	(No)
Button1	Text	Show My Birthday

2. DateTimePicker Control

1. Double Click on Button1 and code

```
MsgBox("Your birth date was " & DateTimePicker1.Text)
MsgBox("Day of the year: " & _
    DateTimePicker1.Value.DayOfYear.ToString())
```

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3. A Word About Terminology

- Program Statement
  វាគឺជាជួរអក្សរនៃ code នៅក្នុង Visual Basic program, ដែលត្រូវបាន executed ដោយ Visual Basic compiler ។ Program statements អាចមានជាច្រើនជួរឬ តែមួយពាក្យ។ ប៉ុន្តែគ្រប់ program statement ទាំងអស់ត្រូវគោរពទៅតាម syntax rules ដែលបានកំនត់ឲ ហើយត្រូវបានកំនត់ដោយ Visual Basic compiler ។ Program statement ត្រូវបានបង្កើតឡើងដោយរួមផ្សំជាមួយនឹង keywords, properties, object names, variables, numbers, special symbols, និង other values.
- Keyword
  គឺជាពាក្យបំរុងទុក (reserved word) ដែលត្រូវបានទទួលស្គាល់ដោយ compiler (Ex: End Keyword ប្រើ សំរាប់បញ្ចប់ដំនើការ program)។ Keywords គឺធ្វើការជាមួយនឹង objects, properties, variables, និង other values ដើម្បីសំរេចដំនើការនៃ line of code ។Keywords ត្រូបានបង្ហាញជាពណ៌ខៀវនៅក្នុង Code Editor។

3. A Word About Terminology

- Variable
  គឺជា special container ដែលត្រូវបានប្រើប្រាស់ដើម្បី ផ្ទុកទិន្នន័យជាបណ្តោះអាសន្ននៅក្នុង program។ programmer បង្កើត variables ដោយប្រើប្រាស់ Dim statement ហើយប្រើប្រាស់វាដើម្បី store លទ្ធផលនៃការ គណនា, file names, input,... ។ Numbers, names, និងតំលៃរបស់ property អាច stored ក្នុង variables។
- Control
  វាគឺជា tool ដែលប្រើសំរាប់បង្កើត object ដែលមាននៅលើ Form ។ យើងអាចយក controls ពី Toolbox ហើយប្រើប្រាស់វាដើម្បីបង្កើត user interface ដូចជា buttons, pictures boxes, និង list boxes.
- Object
  វាគឺជា element មួយដែលបានបង្កើតនៅក្នុង Visual Basic program ដោយ control ក្នុង Toolbox ក្នុង នោះ Form ក៏ជា Object មួយដែរ។ នៅក្នុងកម្មវិធីក្នុងទេស object គឺជា instances ដែលមាន properties, method, និង events។ Objects ក៏មានមុខងារភ្ជាប់មកជាមួយផងដែរ (Ex: List box មាន scroll មកជាមួយស្រាប់)។

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3. A Word About Terminology

- Class
  គឺជាគំរោង “Blueprint” ឬ template សំរាប់បង្កើត Object មួយឬច្រើនហើយកំនត់ពីអ្វីដែល Objects នោះធ្វើ។ នៅក្នុង Visual Basic គឺប្រើប្រាស់ Class មួយចំនួនដូចជា System.Math និង System.Windows.Forms.Form ។ យើងអាចធ្វើការបង្កើត classes ផ្ទាល់ខ្លួនដោយអាចទាញយក (inherit) properties, methods, និង events ពី classes ដទៃទៀត។
- Namespace
  គឺជា hierarchical library នៃ classes ដែលត្រូវរៀបចំនៅក្រោមឈ្មោះតែមួយ (unique name) ដូចជា system.Windows ឬ System.Diagnostiecs. ដើម្បី access ទៅកាន់ class ណាមួយគឺយើងត្រូវសរសេរ import statement នៅផ្នែកខាងលើបង្អស់ហើយសរសេរ namespace របស់ class ដែលត្រូវការ

3. A Word About Terminology

- Property

  គឺជាតំលៃណាមួយ ឬតួអក្សរដែលត្រូវបាន store ដោយ object។ Ex: button មួយគឺមាន Text property ដើម្បីបង្ហាញ Label"នៅលើ button ។ នៅក្នុង code, format សំរាប់ set property គឺមានទំរង់:

  Object.Property = Value

  Button1.Text = "Hello"

- Event procedure

  គឺជា block នៃ code ដែលត្រូវបាន executed ពេលដែល object ត្រូបានប្រើប្រាស់ នៅក្នុង program។ Ex: ពេល Button1 ត្រូបាន Click នោះ Button1_Click event procedure គឺត្រូវបាន execute ។

- Method

  គឺជា special statement ដោយវាជាសកម្មភាព (Action) អ្វីមួយដែល Object បានធ្វើ។ ទំរង់របស់វាគឺ

  Object.Method([Value])

  ListBox1.Items.Add("Check")

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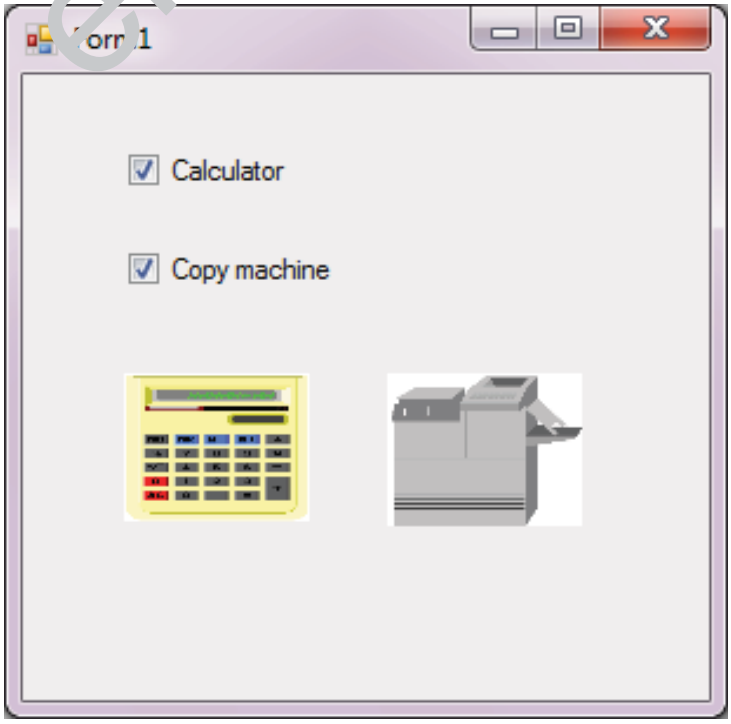
4. Controls for Inputting



4. Controls for Inputting

Object	Property	Setting
CheckBox1	Checked Text	True “Calculator”
CheckBox2	Text	“Copy machine”
PictureBox1	Image SizeMode	Calculator.jpg StretchImage
PictureBox2	Image SizeMode	CopyMachine.jpg StretchImage

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4. Controls for Inputting

1. *Double click on first check box, code it*

```
If CheckBox1.CheckState = 1 Then
    PictureBox1.Image =
System.Drawing.Image.FromFile
     ("calculator.bmp")
    PictureBox1.Visible = True
Else
    PictureBox1.Visible = False
End If
```

4. Controls for Inputting

2. *Double Click on 2nd check box, code it*

```
If CheckBox2.CheckState = 1 Then
        PictureBox2.Image =
System.Drawing.Image.FromFile
         ("CopyMachine.bmp")
        PictureBox2.Visible = True
    Else
        PictureBox2.Visible = False
    End If
```

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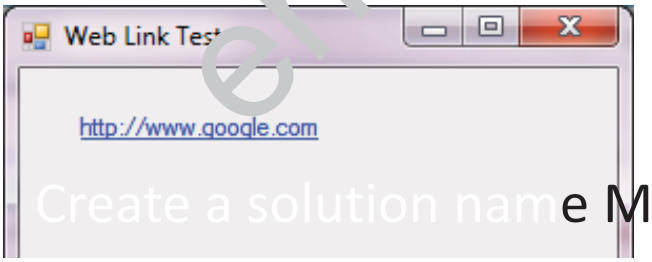
5. LinkLabel Control



Create a solution name MyWeblink >

2. Click LinkLabel Control in Toolbox, and draw it on the form >
3. Set Text property to http://www.google.com
4. Set Text property of form object to Web Link Test >
5. Double click the link object and code >

5. LinkLabel Control

```
LinkLabel1.LinkVisited = True
System.Diagnostics.Process.Start _
  ("http://www.google.com")
```

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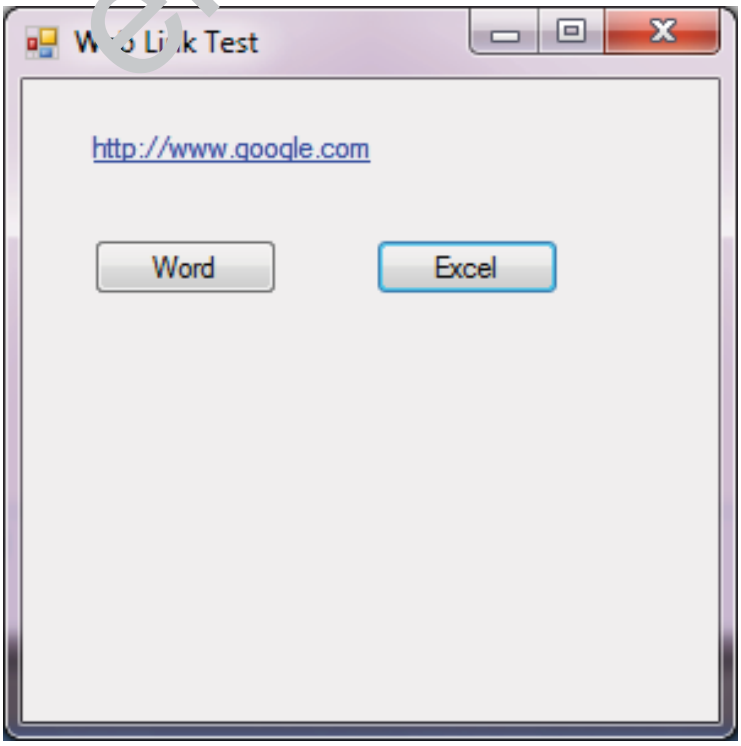
6. Opening Some Programs



6. Opening Some Programs

- Button1 code

```
System.Diagnostics.Process.Start _
    ("F:\at\Test.docx")
```

- System.Diagnostics.Process.Start _
    ("excel.exe", "F:\at\Test.xlsx")

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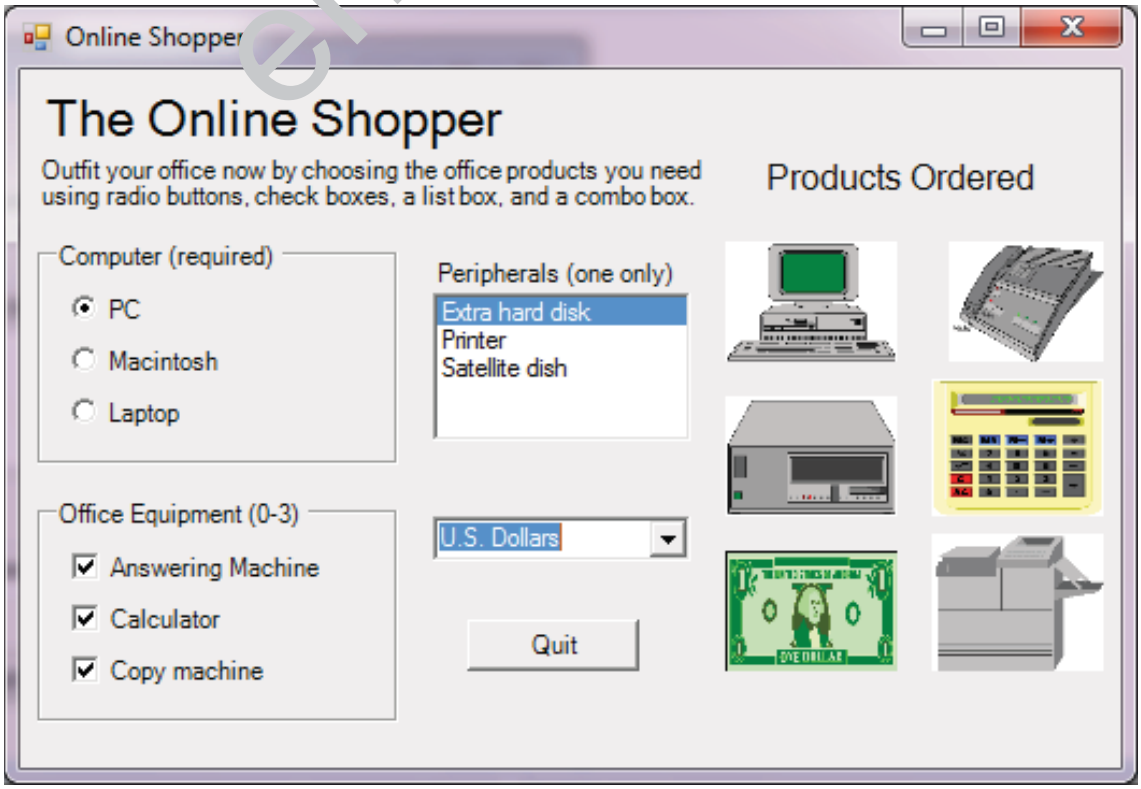
7. Creating Online Shopper



7. Creating Online Shopper

1. Code in Form1_Load event procedure:

```
PictureBox1.Image =
System.Drawing.Image.FromFile("PComputr.bmp")
PictureBox1.SizeMode =
PictureBoxSizeMode.StretchImage

ListBox1.Items.Add("Extra hard disk")
ListBox1.Items.Add("Printer")
ListBox1.Items.Add("Satellite dish")

ComboBox1.Text = "Payment Method"
ComboBox1.Items.Add("U.S. Dollars")
ComboBox1.Items.Add("Check")
ComboBox1.Items.Add("English Pounds")
```

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7. Creating Online Shopper

2. Code in Button1_Click event procedure:

```
End
```

7. Creating Online Shopper

3. RadioButton1_CheckedChanged event:

```
PictureBox1.Image =System.Drawing. _
Image.FromFile("PComputr.bmp")
```

4. RadioButton2_CheckedChanged event:

```
PictureBox1.Image =System.Drawing. _
Image.FromFile(" Computer.bmp ")
```

5. RadioButton3_CheckedChanged event:

```
PictureBox1.Image =System.Drawing. _
Image.FromFile(" Laptop1.bmp ")
```

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7. Creating Online Shopper

6. ListBox1_SelectedIndexChanged event:

```
PictureBox3.SizeMode = PictureBoxSizeMode. _
                    StretchImage
  Select Case ListBox1.SelectedIndex
    Case 0
      PictureBox3.Image = System.Drawing. _
      Image.FromFile("Harddisk.bmp")
    Case 1
      PictureBox3.Image = System.Drawing. _
                Image.FromFile("printer.bmp")
    Case 2
      PictureBox3.Image = System.Drawing. _
      Image.FromFile("Satedish.bmp")
  End Select
```

7. Creating Online Shopper

7. CheckBox1_CheckedChanged event:

```
PictureBox2.SizeMode = PictureBoxSizeMode. _
                       StretchImage
If CheckBox1.CheckState = 1 Then
    PictureBox2.Image = System.Drawing. _
Image.FromFile("AnswMach.bmp")
PictureBox2.Visible = True
Else
PictureBox2.Visible = False
End If
```

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7. Creating Online Shopper

8. CheckBox2_CheckedChanged event:

```
PictureBox4.SizeMode=PictureBoxSizeMode. _
                     StretchImage
If CheckBox2.CheckState = 1 Then
    PictureBox4.Image = System.Drawing. _
Image.FromFile("Calcultr.bmp")
PictureBox4.Visible = True
Else
PictureBox4.Visible = False
End If
```

7. Creating Online Shopper

9. CheckBox3_CheckedChanged event:

```
PictureBox6.SizeMode = PictureBoxSizeMode. _
                       StretchImage
If CheckBox3.CheckState = 1 Then
PictureBox6.Image = System.Drawing. _
Image.FromFile("CopyMach.bmp")
PictureBox6.Visible = True
Else
PictureBox6.Visible = False
End If
```

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7. Creating Online Shopper

10. ComboBox1_SelectedIndexChanged event:

```
PictureBox5.SizeMode = PictureBoxSizeMode.StretchImage
Select Case ComboBox1.SelectedIndex
Case 0
        PictureBox5.Image = System.Drawing. _
        Image.FromFile("Dollar.bmp")
        Case 1
                PictureBox5.Image = System.Drawing. _
        Image.FromFile("Check.bmp")
        Case 2
        PictureBox5.Image = System.Drawing. _
        Image.FromFile("PoundBag.bmp")
End Select
```

Enter 04
Working with Menu, Toolbars, and Dialog Boxes

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1. Using MenuStrip Control

- MenuStrip control គឺជា Tool ប្រើសំរាប់ដាក់ menus ទៅក្នុង program។ ជាមួយ MenuStrip យើងអាច add, modify, reorder menus ...
- ដើម្បីឲ menu process គឺត្រូវសរសេរ event procedures ផងដែរ។

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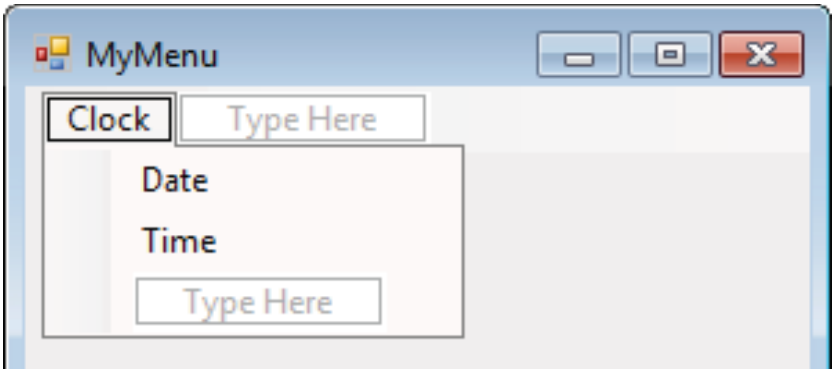
1. Using MenuStrip Control

1. Choose MenuStrip in Toolbox >
2. In Type Here tag change to Clock >
3. Type Date to create Date command >
4. Type Time to create Time command.



2. Access Keys to Menu

- Access Keys គឺត្រូវបានប្រើប្រាស់ដើម្បី execute menu តាមរយៈ Keyboard។ ក្នុង menu key ដែលជាប្រភេទ Access Keys គឺមានបន្ទាត់ឆូតកាត់ពីក្រោម។ ដើម្បីប្រើប្រាស់ Access Key គឺត្រូវចុច Alt + Access Key។
- ដើម្បីបង្កើត Access Key គឺត្រូវដាក់ ampersand (&) នៅខាងមុខ Key ដែលត្រូវការ។

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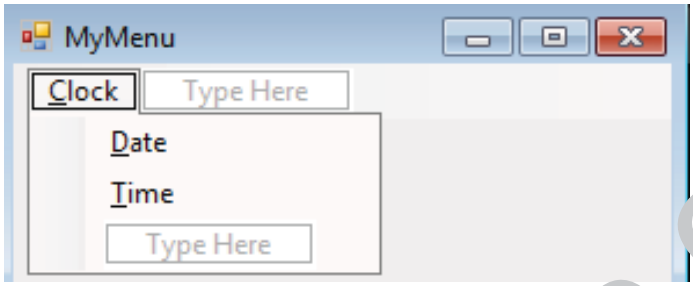
2.1. Menu Conventions

- នៅពេលបង្កើត menu items, គឺត្រូវគោលការណ៍មួយដូចខាងក្រោម:
  - ប្រើប្រាស់ caption ខ្លីៗ មួយឬពីរពាក្យប៉ុណ្ណោះ
  - Assign Access Key នៅត្រង់ menu items នីមួយៗ ទៅតាមពាក្យដែលងាយក្នុងការចងចាំ
  - Menu items ដែលនៅ level ដូចគ្នាត្រូវមាន access key ខុសគ្នា
  - ដាក់ ellipsis (...) ខាងក្រោយ menu command ដើម្បីបញ្ជាក់ថាមាន dialog box បន្តែមទៀត

2.2. Add Access Keys

1. Click the Clock menu name >
2. Move cursor before letter C and add & >
3. Click the Date command in menu list >
4. Move cursor before letter D and add & >
5. Click the Time command in menu list >
6. Move cursor before letter T and add & .



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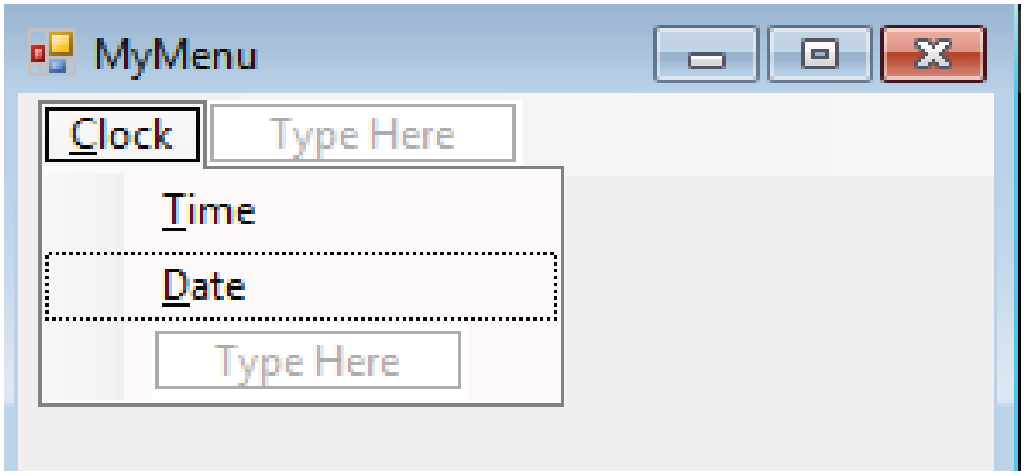
2.3. Change order of menu items

1. Drag on the menu items that wanted >
2. Drop to the wanted place.



3. Processing Menu Choices

1. Create a Label in form and set its property >

Object	Property	Setting
Label1	AutoSize	False
	BorderStyle	FixedSingle
	Font	Microsoft Sans Serif, Bold, 14-point
	Text	(empty)
	TextAlign	MiddleCenter

2. Double Click on Clock menu to display its command >

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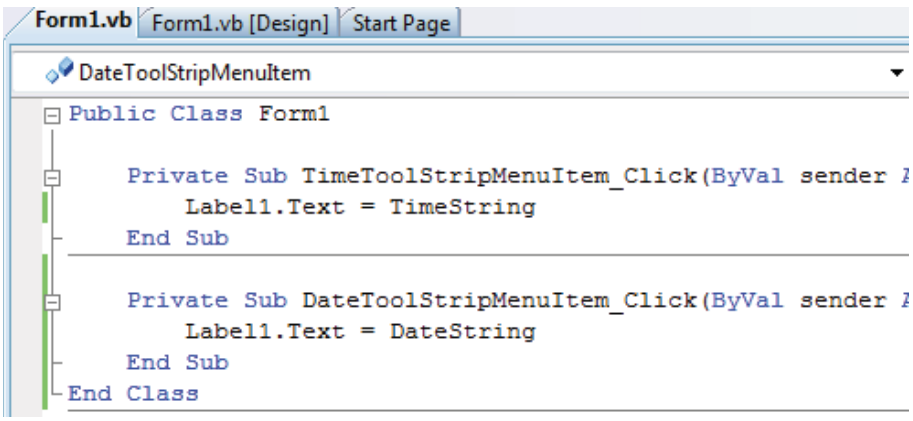
3. Processing Menu Choices

3. Double click Time command and code it >

   Label1.Text = TimeString

4. Double click Time command and code it.

   Label1.Text = DateString



3. Processing Menu Choices

Property or Function	Description
TimeString	Sets or returns the current time from system clock
DateString	Sets or returns the current date from the system clock
Now	Sets or returns the current date and time
Hour(date)	Extracts the hour portion of the specified data/time(0-23)
Minute(date)	Extracts the minute portion of the specified data/time(0-59)
Second(date)	Extracts the second portion of the specified data/time(0-59)
Month(date)	Extracts the whole number representing the month (1-12)
Year(date)	Extracts the year portion of the specified date/time value
Weekday(date)	Extracts a whole number representing the day of the week (1=Sunday, 2=Monday,7=Saturday)

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4. Using ToolStrip Control

- ToolStrip control គឺជា Tool ប្រើសំរាប់បង្កើត Toolbars សំរាបប្រើប្រាស់នៅក្នុង program។
- To create ToolStrip in Toolbox:
  1. Choose ToolStrip and draw it in form >
  2. Click arrow in the upper-right corner >
  3. Click Insert Standard Items >
  4. Click Add ToolStripButton arrow on the right side, then click the Button item >
  5. Right Click new button, point to DisplayStyle, and click ImageAndText >

4. Using ToolStrip Control

6. Change the ToolStripButton1 object‟s Text property to Color >
7. Right Click the Color Button and choose Set Image Command >
8. Click Local Resource and then click Import Button >
9. Choose the appropriate icon, click Open, and Click OK Button >
10. Right Click new button, point to DisplayStyle, and click ImageAndText >

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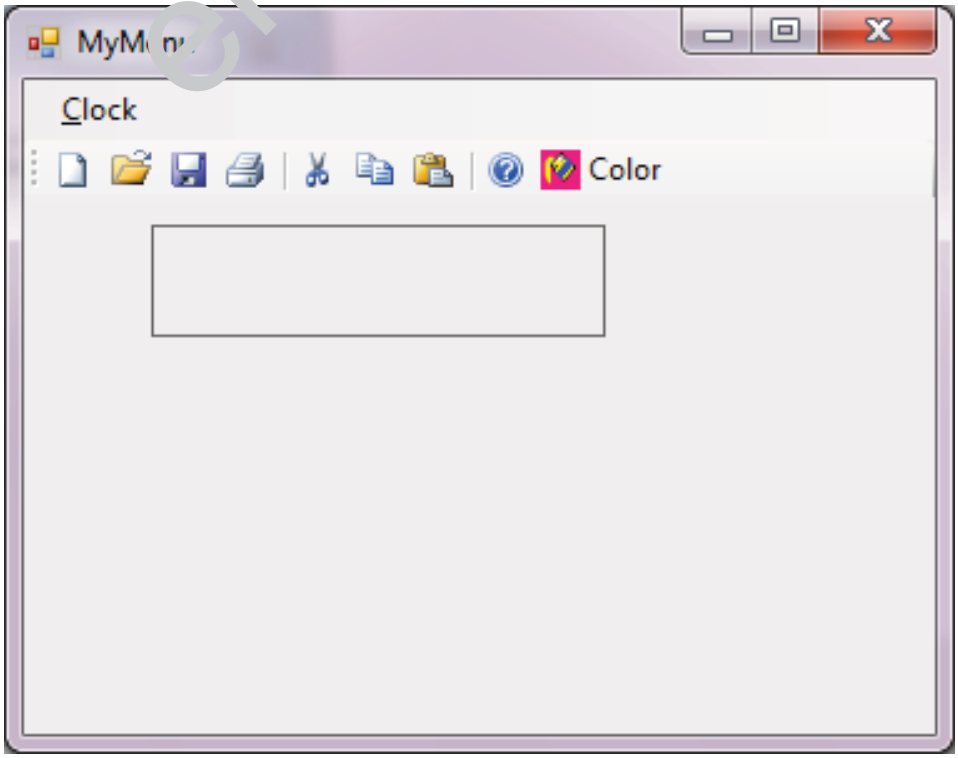
4. Using ToolStrip Control



5. Using Dialog Box Control

- ក្នុង Visual Studio មាន standard dialog box controls ចំនួន 8 នៅក្នុង Toolbox។ វាត្រូវបានបង្កើតរួចរាល់សំរាប់ប្រើប្រាស់ដោយយើងមិនចាំបាច់បង្កើតវាទ្បើងវិញទ្បើយ។
- យើងគ្រាន់តែតំរូវឲសរសេរ code នៅក្នុង event procedure ដើម្បីធ្វើការភ្ជាប់រវាង dialog boxes នេះជាមួយនឹង program តែប៉ុណ្ណោះ។

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5. Using Dialog Box Control

Control name	Purpose
OpenFileDialog	Gets the drive, folder name, and file name for an existing file
SaveFileDialog	Gets the drive, folder name, and file name for a new file
FontDialog	Lets the user choose a new font type and style
ColorDialog	Lets the user select a color from a palette
FloderBrowser Dialog	Lets the user navigate through a computer's folder structure and select a folder
PrintDialog	Lets the user set printing options
PrintPreview Dialog	Displays a print preview dialog box like the Ms.Word does
PageSetup Dialog	Lets the user control page setup options, such as margin, paper size, and layout

5. Using Dialog Box Control

1. Choose OpenFileDialog control in Toolbox and draw it in form >
2. Choose ColorDialog control in Toolbox and draw it in form >
3. Choose Picture Box control in Toolbox and draw it in form >
4. Use shortcut arrow in picture box object to set the SizeMode property to StretchImage.

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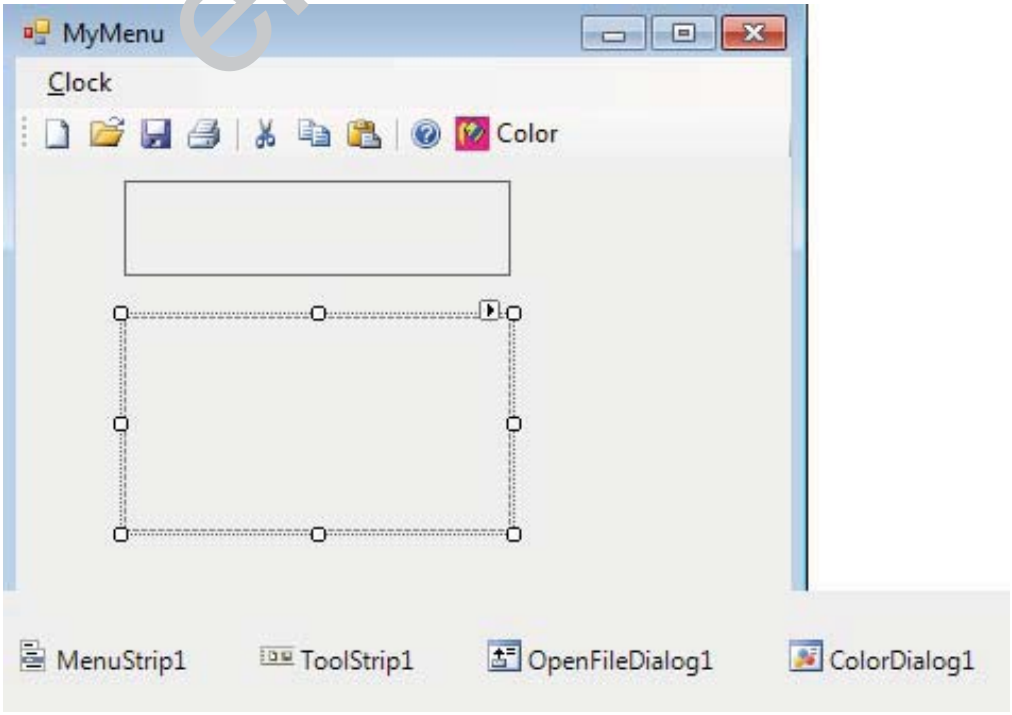
5. Using Dialog Box Control



6. Event Procedure of Dialog Box

1. Double click Open button in toolbar >
2. Complete the following code

```
OpenFileDialog1.Filter = "Bitmaps          (*.bmp)|*.bmp"
If OpenFileDialog1.ShowDialog() = _
                              DialogResult.OK Then
PictureBox1.Image = System.Drawing.Image._
      FromFile(OpenFileDialog1.FileName)
  End If
```

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6. Event Procedure of Dialog Box

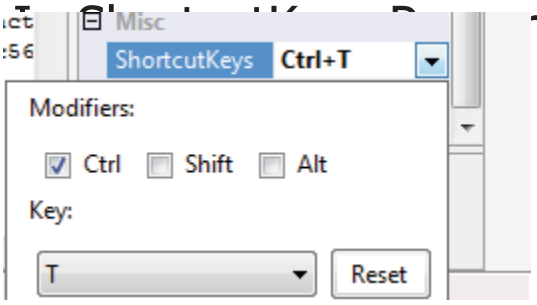
3. Double click Color button in toolbar >
4. Complete the following code

```
ColorDialog1.ShowDialog()
Label1.ForeColor = ColorDialog1.Color
```

7. Assigning Shortcut Keys to Menus

- ក្នុង MenuStrip អាចឲប្រើបង្កើត shortcut keys ដើម្បីបើក menu ឬ command ដែលមានៗ
- To create shortcut on Time Menu

1. Click on clock menu and click Time command >
2. In ShortcutKeys Property Choose Ctrl+T >



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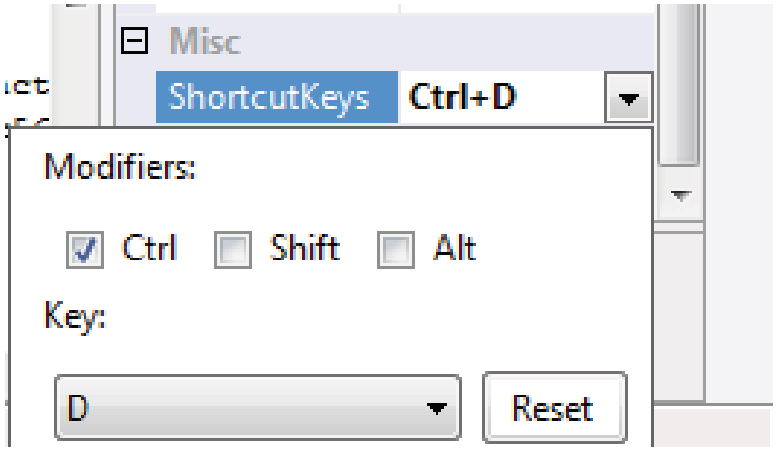
7. Assigning Shortcut Keys to Menus

- To create shortcut on Date Menu

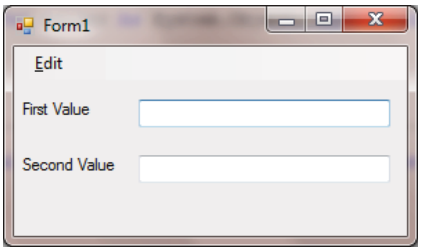
1. Click on clock menu and click Date command >
2. In ShortcutKeys Property Choose Ctrl+D.



8. Create Copy, Cut, and Paste Menus

```
Public Class Form1
   Private Sub CopyToolStripMenuItem_Click(---)
      If TextBox1.Text <> "" Then
         Clipboard.SetText(TextBox1.Text)
      End If
   End Sub

   Private Sub CutToolStripMenuItem_Click(---)
      If TextBox1.Text <> "" Then
         Clipboard.SetText(TextBox1.Text)
         TextBox1.Text = ""
      End If
   End Sub
```



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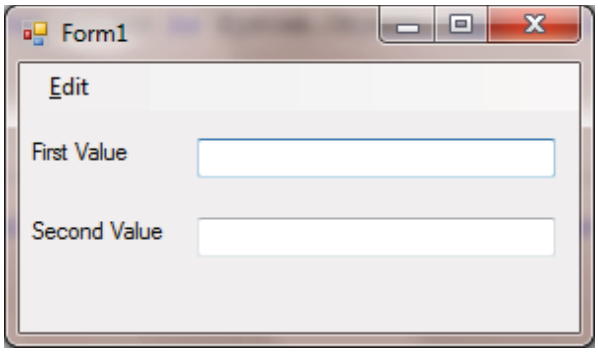
8. Create Copy, Cut, and Paste Menus

```
   Private Sub PasteToolStripMenuItem_Click(---)
      TextBox2.Text = Clipboard.GetText
   End Sub

   Private Sub ClearToolStripMenuItem_Click(---)
         TextBox1.Text = ""
         TextBox2.Clear()
   End Sub
End Class
```

9. ContextMenuStrip

1. Create the following form and it’s properties



2. Complete the following Code:

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9. ContextMenuStrip

```
Private Sub CopyToolStripMenuItem1_Click(---)
    If TextBox1.Text <> "" Then
          Clipboard.SetText(TextBox1.Text)
           End If
End Sub

Private Sub CutToolStripMenuItem1_Click(---)
    If TextBox1.Text <> "" Then
          Clipboard.SetText(TextBox1.Text)
       TextBox1.Text = ""
    End If
End Sub
```

9. ContextMenuStrip

```
Private Sub PasteToolStripMenuItem1_Click(---)
        TextBox2.Text = Clipboard.GetText
End Sub
Private Sub ClearToolStripMenuItem1_Click(---) Handles
    ClearToolStripMenuItem1.Click
        TextBox1.Text = ""
        TextBox2.Clear()
End Sub
```

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9. ContextMenuStrip

3. Select on TextBox1 and in it's ContextMenu Property choose the name of ContextMenu that just created.

Enter 05
Variables, Formulas, and .NET Framework

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Table of Contents

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1. Visual Basic Program Statement

- Program Statement គឺជាបណ្តាំនៃ keyword, properties, object names, variables, numbers, special symbols, and others values ដែលត្រូវបានរៀបចំទៅជា valid instruction ដោយ Visual Basic compiler.
- Rules ដែលចាំបាច់ត្រូវតែប្រើប្រាស់ពេលបង្កើត programming statement ត្រូវបានហៅថា statement syntax.

2. Variables store Information

- Variable គឺជា Location សំរាប់ផ្ទុកទិន្នន័យបណ្តោះអាសន្ននៅក្នុង Program ដែលមាន word, numbers, dates, properties,...
- មុនពេលយើងប្រើប្រាស់ Variable គឺយើងត្រូវ set aside memory នៅក្នុង computer ជាមុនសិនដើម្បីប្រើប្រាស់វានៅពេលក្រោយ.

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2.1. Setting Aside Memory: The *Dim* Statement

- ក្នុង VB.Net 2003 គឺទាមទារឲ្យ Programmer ត្រូវ declare variable មុនពេលប្រើប្រាស់វា. ប៉ុន្តែមកដល់ Visual Basic 6 គឺយើងអាចប្រើប្រាស់ variable ដោយមិនចាំបាច់ធ្វើការ declare វាទេ។ឃ.
- (Implicit <> Explicit) Variable Declaration

- ដើម្បី declare variable, គឺត្រូវកំនត់ឈ្មោះរបស់វានៅខ្លាងមុខ Dim (Dimension). ការ declare នេះគឺដើម្បីបង្កើតបំបន់នៅក្នុង memory សំរាប់ varjable នៅពេល Program Run និងដឹងប្រភេទទិន្នន័យដែលទទួលយក.

2.1. Setting Aside Memory: The *Dim* Statement

- Ex: Dim LastName As String
- បន្ទាប់ពី declare variable ហើយយើងអាច assign information ទៅវានៅក្នុង Code ដោយប្រើប្រាស់ assignment operator(=).
- Ex: LastName = “Jefferson”
  LastName = “1313 Mockingbird Lane”
- ប្អូនាប់ពី LastName ត្រូវបាន assign value ហើយគឺអាចយកវាទៅប្រើជំនួស “Jefferson” បាន.
- Ex: Label1.Text = LastName

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2.2. Implicit variable Declaration

- ប្រសិនបើយើងចង់ declare variable ដោយមិនចាំបាច់កំនត់ Dim Statement (Explicit) នោះយើងត្រូវសរសេរ Option Explicit Off Statement នៅផ្នែកខ្ពស់លើបំផុតនៃ form”s program code.
- របៀបមួយផ្សេងទៀតដែលអាចប្រើប្រាស់បានគឺ Option Infer statement, ប្រសិនបើត្រូវបាន Set “On” នោះ Visual Basic នឹងស្រាវជ្រាវរកប្រភេទនៃ variable ដោយផ្អែកលើតំលៃដែលបាន assign.

2.2. Implicit Variable Declaration

- Option Infer On

  Dim attendance = 100
- Option Infer On មានន័យថា

  Dim attendance As Integer = 100
- ប៉ុន្តែសំរាប់ Statement ទាំងពីរខាងលើដែលបានបង្ហាញគឺមិនត្រូវបានលើកទឹកចិត្តឲ្យប្រើប្រាស់នោះទេព្រោះវាអាចទទួលបានលទ្ធផលដែលមិនស្របក្នុងករណីណាមួយ.

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2.2. Declare Variables in time

- Syntax1:

  Keyword VariableName As DataType

```
Public Class Form1

    Private Sub Button1_Click(ByVal
        Dim first As Single
        Dim second As Single
        Dim result As Single
        first = TextBox1.Text
        second = TextBox2.Text
        result = first + second
        MsgBox(result, , "result")
    End Sub
End Class
```

2.2. Declare Variables in time

- Syntax2:

  Keyword Var1, Var2, Var3,... As DataType

```
Public Class Form1

    Private Sub Button1_Click(ByVal sender A
        Dim first, second, result As Single
        first = TextBox1.Text
        second = TextBox2.Text
        result = first + second
        MsgBox(result, , "result")
    End Sub
End Class
```

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2.2. Declare Variables in time

- Syntax3:

  Keyword Var1 As DataType,
  Var2 As DataType,
  Var3 As DataType

```
vate Sub Button1_Click(ByVal sender As System.Object, B
Dim first As Single, second As Single, result As Singl
first = TextBox1.Text
second = TextBox2.Text
result = first + second
title = "result"
MsgBox(result, , title)
Sub
```

2.3. Type of Keywords

- Public: សំរាប់កំនត់ឲ Variable អាចប្រើប្រាស់បានជាមួយនឹង code file ដទៃទៀតក្នុង project។
- Private: សំរាប់កំនត់ឲ Variable អាចប្រើប្រាស់បានជាមួយនឹងតំបន់ code ដែលវា declare។
- Dim: គឺរក្សាតំលៃរហូតដល់ Procedure ត្រូវបានបញ្ចប់។
- Static: គឺអាចរក្សាតំលៃទុករហូតដល់ Application ត្រូវបានបញ្ចប់។
- Const: គឺអាចរក្សាតំលៃមិនប្រែប្រួលនៅពេល Procedure ដំនើរការ។

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2.4. Declarations within a procedure

- នៅក្នុងការ declare variable នៅក្នុង procedure គឺអាចប្រើប្រាស់បានជាមួយនឹង procedure ខ្លួនវាតែប៉ុណ្ណោះ ដោយមិនប្រើប្រាស់នៅក្នុង Code File ដទៃទៀតនៅ ក្នុង Project បានឡើយ។
- Keywords ដែលអាចប្រើក្នុង procedure មាន:
  - Dim
  - Static
  - Const

2.4. Declarations in the *General Declarations*

- វាគឺជាការ declare variable នៅផ្នែកលើបំផុតនៃ Code File ដែលអាចប្រើប្រាស់បានជាមួយនឹង procedure ហើយ អាចប្រើប្រាស់នៅក្នុង Code File ដទៃទៀតនៅ ក្នុង Project បានទៀតផង។
- Keywords ប្រើក្នុង General Declaration មាន:
  - Private
  - Public
  - Dim
  - Const

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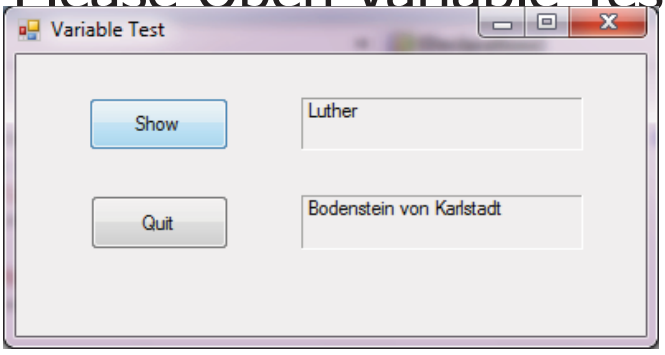
3. Using Variables in Program

- Variables អាចផ្ទុកនូវ តំលៃដដែលនៅគ្រប់ពេលដែល program កំពុងប្រើប្រាស់និងអាចផ្លាស់ប្តូរតំលៃរបស់វាឲប្រែប្រួលបានគ្រប់ពេលទាំងអស់ដោយផ្នែកលើតំរូវការរបស់យើង។
- Please Open Variable Test.sln



3. Using Variables in Program

1. Code it on Button1 Click Procedure:

```
Dim LastName As String
    LastName = "Luther"
    Label1.Text = LastName

    LastName = "Bodenstein von Karlstadt"
    Label2.Text = LastName
```

2. Code it on Button2 Click Procedure:

```
End
```

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4. Variable Naming Conventions

- ក្នុងការកំនត់ឈ្មោះ Variable គឺចាំបាច់នៅក្នុងការសរសេរ program ដោយត្រូវដាក់ឈ្មោះវាឲ្យខ្លី ហើយងាយចងចាំ. ខាងក្រោមនេះជា variable naming conventions:
  - ចាប់ផ្តើមឈ្មោះ variable ជាមួយ letter ឬ underscore (មិនអាចជាលេខឬនិម្មិតសញ្ញាពិសេសៗ)
  - ឈ្មោះ variables យ៉ាងច្រើន 33 តួទោះបីជាវាអនុញ្ញាតិឲ្យរហូតដល់ 255 តួក៏ដោយ
  - ឈ្មោះរបស់ variable ត្រូវរៀបរាប់ឲ្យពេញអត្ថន័យ salesTaxRate <> Tax Rate

4. Variable Naming Conventions

- តួអក្សរដើមពាក្យនីមួយៗ អាចជាអក្សរធំ (DateOfBirth) ប៉ុន្តែ Programmer ភាគច្រើនសរសេរតួអក្សរនៅខាងមុខគេអាចអក្សរតូចវិញ (camel casing) ដើម្បីបែងចែកឲវាខុសពីឈ្មោះ Function និង Module names (dateOfBirth).
- មិនអាចប្រើឈ្មោះរបស់ keywords, objects, ឬ properties.

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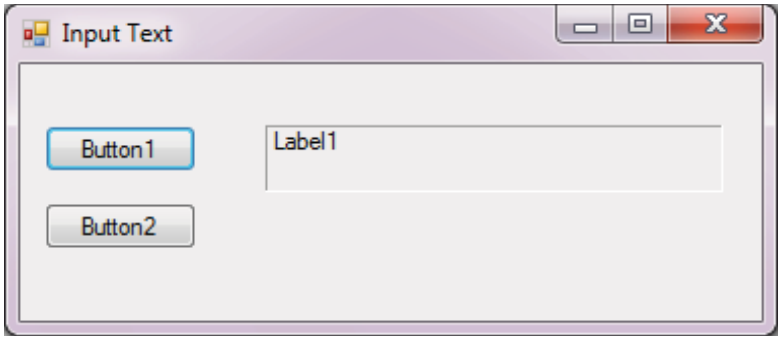
5. Using Variable to Store Input

- Create the Input Text Form:



Object	Property	Setting
Button1	Text	Input Box
Button2	Text	Quit
Label1	BorderStyle	Fiexed3D

5. Using Variable to Store Input

- Code in Button1_Click event procedure:

```
Dim Prompt, FullName As String
Prompt = "Please enter your name."
FullName = InputBox(Prompt)
Label1.Text = FullName
```

- Code in Button2_Click event procedure:

```
End
```

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6. What is Function?

- InputBox គឺជា keyword ពិសេសមួយហៅថា function. Function គឺជា statement សំរាប់ធ្វើការងារណាមួយ.
- តំលៃដែល return ដោយ function គឺអាច assign ទៅ១ variable, property,ឬ statement ដទៃទៀត.
- FullName = InputBox(Prompt)

6. What is Function?

- Functions តែងតែប្រើ arguments មួយឬច្រើន ដើម្បីកំនត់ការងារផ្សេងៗរបស់ពួកវា.
- FullName=InputBox(Prompt, Title)

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7. Using Variable for Output

- យើងអាច display contents នៃ variable ដោយធ្វើការ assign property របស់វាដូចជា Text, Label,...
- Function dialog box ដែល display សំខាន់មួយទៀតគឺ MsgBox Function ដែលវា display ព័ត៌មានជា dialog box វិញ ហើយវាមាន options ជាច្រើនសំរាប់ឲយើងកំនត់.

7. Using Variable for Output

- Syntax for MsgBox function is:

  ButtonClicked = MsgBox(Prompt,Buttons,Title)

  > Prompt: ជាអក្សរដែល display ក្នុង message box

  > Buttons: ជាម៉ូដ Buttons ដែលត្រូវបង្ហាញជាមួយ

  > Title: ជាចំនងជើងនៅលើ title bar របស់ Box

  > ButtonClicked: គឺជា variable ដែលទទួលតំលៃពី MsgBox

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7. Using Variable for Output

- To test MsgBox function, open Input Box Form and complete the following code in the last line of codes:

```
MsgBox(FullName, , "Input Results")
```

- Double Click on Button2_Click:

```
If MsgBox("Do you want to exit?",
MsgBoxStyle.YesNo) =MsgBoxResult.Yes Then
MsgBox("Good bye", , "Yes Button")
End
Else
MsgBox("Hello", , "No Button")
End If
```

8. Specific Data Types

Data type	Size	Range	Sample usage
Short	16-bit	-32,768 through 32,767	Dim birds As short Birds = 12500
UShort	16-bit	0 through 65,535	Dim Days As Ushort Days = 55000
Integer	32-bit	-2,147,483,648 through 2,147,483,647	Dim Insects As Integer Insects = 37500000
UInteger	32-bit	0 through 4,294,967,295	Dim Joys As Uinteger Joys = 3000000000
Long	64-bit	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807	Dim WorldPop As Long WorldPop=4800000004
ULong	64-bit	0 through 18,446,744,073,70 9,551,615	Dim Starts As ULong Starts = 1800000000000

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8. Specific Data Types

Data type	Size	Range	Sample usage
Single	32-bit Floating point	-3.4028235E38 through 3.4028235E38	Dim Price As Single Price = 899.99
Double	64-bit Floating point	-1.79769313486231E308 through 1.79769313486231E308	Dim Pi As Double Pi = 3.1415926535
Decimal	128-bit	0 through +/-79,228,162,514, 264,337,593,543,950,335 (+/-7.9...E+28) With no decimal point; 0 through +/-7.9228162514264337593543950335 with 28 places to the right of the decimal. Append "D" if you want to force Visual Basic to initialize a Decimal	Dim Debt As Decimal Debt = 7600300.5D

8. Specific Data Types

Data type	Size	Range	Sample usage
Byte	8-bit	0 through 255 (no negative numbers)	Dim RetKey As Byte RetKey =13
SByte	8-bit	-128 through 127	Dim NegVal As SByte NegVal = -20
Char	16-bit	Any Unicode symbol in the range 0-65,535. Append ”C” when initializing a Char	Dim UnicodeChar As Char UnicodeChar = “C”

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8. Specific Data Types

Data type	Size	Range	Sample usage
Boolean	16-bit	True or False.(During conversations, 0 is converted to False, other values to True.)	Dim Flag as Boolean Flag = True
Date	64-bit	January 1, 001, through December 31,9999	Dim Birthday as Date Birthday = #3/1/1963#
Object	32-bit	Ant type can be stored in a variable of type Object.	Dim MyApp As Oject MyApp = CreateObject- (“Word.Application”)

9. User-Defined Data Types

- Visual Basic អាចឲយើងបង្កើត Data Type ផ្ទាល់ខ្លួនបាន ដែលហៅថា User-Defined Data Types.
- ការបង្កើត UDT គឺត្រូវប្រើប្រាស់ Structure statement ហើយត្រូវ declare វាដោយប្រើប្រាស់ Dim statement ដូច variables ដទៃទៀតដែរ.

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9. User-Defined Data Types

- Structure statement គឺមិនអាចបង្កើតស្ថិតនៅក្នុង event procedure ណាមួយទេ្បីយ ដោយវាត្រូវស្ថិតនៅផ្នែកខាងលើបំផុតនៃ code module.
- Ex:

```
Structure Employee
    Dim Name As String
    Dim DateOfBirth As Date
    Dim HireDate As Date
End Structure
```

9. User-Defined Data Types

- បន្ទាប់ពីបាបង្កើត UDT data type ហើយនោះគឺអាចប្រើប្រាស់បាន នៅក្នុងទីតាំងណាមួយនៃ Form ដូច Variables ផ្សេងៗទៀត.

- Ex:

  Dim ProductManager As Employee

  ProductManager.Name = “Greg Baker”

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10. Constants Variables

- ប្រសិនបើ variable របស់យើងមានតំលៃជាក់លាក់ណាមួយដែលមិនប្រែប្រួលនោះ (Pi II) គឺយើងអាច store វាជាមួយនឹង constant ជំនួស variable.
- Constant គឺជាប្រភេទ variable មួយដែល store ទិន្នន័យជាក់លាក់ណាមួយហើយតំលៃនោះមិនប្រែប្រួលឡើយ.
- Ex:

  Const Pi As Double = 3.14159265

10. Constants Variables

- ដើម្បីអាច constant ប្រើបានជាមួយនឹងគ្រប់ objects និង event procedures ក្នុង form នោះគឺត្រូវ declare វានៅផ្នែកខាងលើនៃ form ដូច structure ផងដែរ.
- ដើម្បី constant អាចប្រើបាននៅគ្រប់ form ឬ module ទាំងអស់គឺត្រូវកំនត់ public Keyword នៅខាងមុខវា.
- Ex: Public Const Pi As Double = 3.14159265

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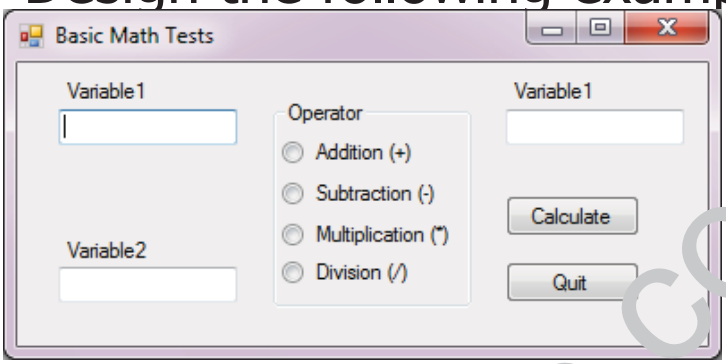
11 Operators

Operator	Description
+	Addition
-	Subtraction
*	Multiplication
/	Division
\	Integer division
Mod	Remainder division
^	Exponentiation
&	String concatenation

11.1. Basic Math Operator

- The basic math operator:
  - Addition
  - Subtraction
  - Multiplication
  - Division
- Design the following example:



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11.1. Basic Math Operator

- Complete the following code in Code Editor:

```
Public Class Form1
   'Declare FirstNum and SecondNum variables
   Dim FirstNum, SecondNum As Double
   Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
    System.EventArgs) Handles Button1.Click
      'Assign text box values to variables
      FirstNum = TextBox1.Text
      SecondNum = TextBox2.Text
      'Determine checked button and calculate
      If RadioButton1.Checked = True Then
         TextBox3.Text = FirstNum + SecondNum
      End If
```

11.1. Basic Math Operator

- Complete the following code in Code Editor:

```
If RadioButton2.Checked = True Then
        TextBox3.Text = FirstNum - SecondNum
    End If
    If RadioButton3.Checked = True Then
        TextBox3.Text = FirstNum * SecondNum
    End If
    If RadioButton4.Checked = True Then
        TextBox3.Text = FirstNum / SecondNum
    End If
  End Sub
End Class
```

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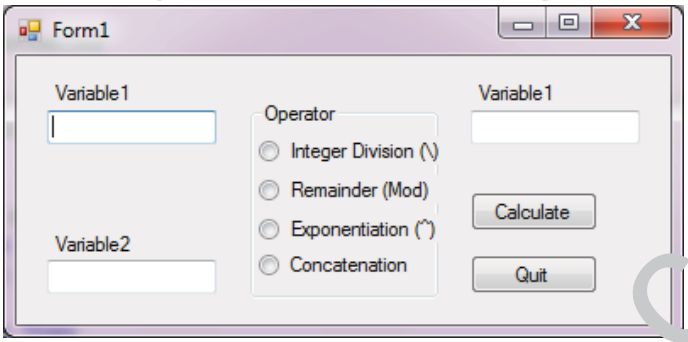
11.2. Shortcut Operators

Operation	Long-form syntax	Shortcut syntax
Addition (+)	X = X + 6	X += 6
Subtraction (-)	X = X - 6	X -= 6
Multiplication (*)	X = X * 6	X *= 6
Division (/)	X = X / 6	X /= 6
Integer division (\)	X = X \ 6	X \= 6
Remainder division (^)	X = X ^ 6	X ^= 6
Exponentiation (&)	X = X & “ABC”	X &= “ABC”

11.3. Advanced Operators

- The basic math operator:
  - Integer division (\)
  - Remainder division (Mod)
  - Exponentiation (^)
  - String concatenation (&)
- Design the following example:



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11.3. Advanced Operators

- Complete the following code in Code Editor:

```
Public Class Form1
    'Declare FirstNum and SecondNum variables
    Dim FirstNum, SecondNum As Double
    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
     System.EventArgs) Handles Button1.Click
        'Assign text box values to variables
        FirstNum = TextBox1.Text
        SecondNum = TextBox2.Text
        'Determine checked button and calculate
        If RadioButton1.Checked = True Then
            TextBox3.Text = FirstNum \ SecondNum
        End If
```

11.3. Advanced Operators

- Complete the following code in Code Editor:

```
        If RadioButton2.Checked = True Then
        TextBox3.Text = FirstNum Mod SecondNum
        End If
        If RadioButton3.Checked = True Then
        TextBox3.Text = FirstNum ^ SecondNum
        End If
        If RadioButton4.Checked = True Then
        TextBox3.Text = FirstNum & SecondNum
        End If
    End Sub
End Class
```

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12. Methods in Microsoft.NET Framework

- Methods ដែលយើងប្រើប្រាស់គឺត្រូវបានផ្តល់ដោយ Microsoft.NET Framework.
- ក្នុងនោះមានដូចជា math methods ដែលវាជួយយើងក្នុងការធ្វើការងារជាមួយ numbers in formulas.
- .NET Framework គឺជា major feature នៃ Visual Studio ដែលវាត្រូវបានរៀបចំជា class សំរាប់ឲយើងអាចប្រើប្រាស់នៅក្នុង programming projects.

12. Methods in Microsoft.NET Framework

- ឧទាហរណ៍យើងប្រើប្រាស់ Math Method នៅក្នុង System.Math class នៃ .NET Framework.
- Version របស់ .NET Framework មាន:
  - .NET Framework 3.5
  - .NET Framework 3.0
  - .NET Framework 2.0
- ដើម្បីប្រើប្រាស់ Math Class នៃ .NET Framework នោះសូមសរសេរ code import ដាក់នៅផ្នែកលើគេ ក្នុង Code Editor:

```
Imports System.Math
```

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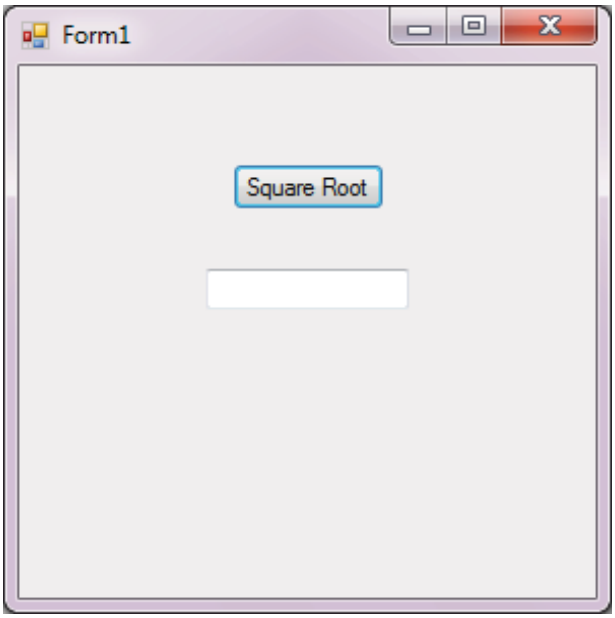
12.1. Methods in Math Class

- Here are the math class in .NET Framework 3.5

Method	Purpose
Abs(n)	Returns the absolute value of n.
Exp(n)	Returns the constant e raised to the power n.
Sign(n)	Returns -1 if n is less than 0, 0 if n is 0, +1 if n is greater than 0.
Sqrt(n)	Returns the square root of n.

12.2. Use the System.Math

- Create the MyFramworkMath:



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12.2. Use the System.Math

- Complete the following code:

```
Imports System.Math
Public Class Form1
    Private Sub Button1_Click(...)
        Dim Result As Double
        Result = Sqrt(625)
        TextBox1.Text = Result
    End Sub
End Class
```

13. Order of Precedence

- Total = 10+15*2/4^2

Operator	Order of precedence
()	Parentheses is **first**.
^	Exponentiation is **second**.
-	Negative number os **third**.
* /	Multiplication and division are **fourth**.
\	Integer division is **fifth**.
Mod	Remainder division is **sixth**.
+ -	Addition and subtraction are **last**.

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13. Order of Precedence

- Total = 10+15*2/4^2
  Total = 10+15*2/16
  Total = 10+30/16
  Total = 10+1.875
  Total = 11.875

14. Using Parentheses

- Total = ((8-5)*3)^2
  Total = ((3)*3)^2
  Total = (9)^2
  Total = 81

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Enter 06
Using Decision Structures

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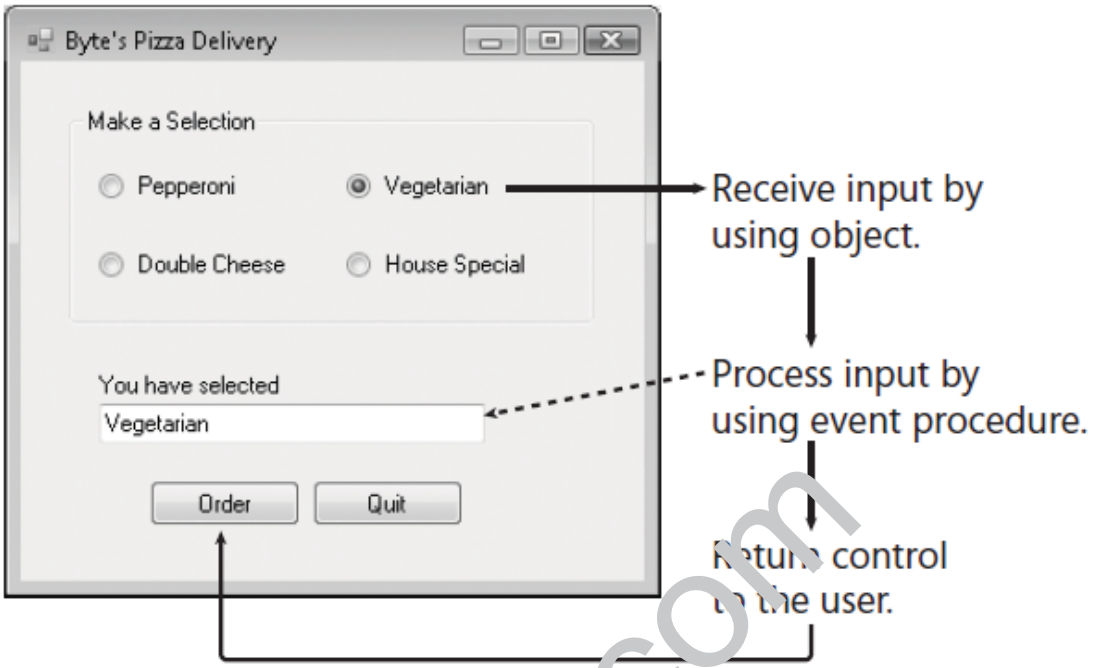
1. Event-Driven Programming

- ក្នុង Program ដែលយើងបង្កើត វាមានបង្ហាញជាច្រើនដូច Toolbax controls, menus, toolbars, និង dialog boxes នៅលើ screen ដែល users អាច ធ្វើការជាមួយនឹង elements ទាំងនេះទៅតាមការមើលឃើញរបស់ពួកគេ។
- Program គឺរង់ចាំការបញ្ជាពី users ដើម្បីធ្វើការ response និង process ការងាររបស់វាដែលវិធី សាស្ត្រនេះត្រូវបានហៅថា event-driven programming។

1. Event-Driven Programming



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1. Event-Driven Programming

- The event-driven nature នៃ Visual Basic គឺ ការងារទាំងអស់ដែលសំរេចទៅបានតាមរយៈ event procedure។
- Event គឺធ្វើការជាមួយនឹង block នៃ code ដើម្បីដំនើការការងារដូចជា Input, calculate new values, display output, និង handle other tasks.
- Event សំខាន់ៗមាន Click, CheckedChaged, SelectedIndexChanged,...

2. Event Supported by Visual Basic Objects

- Object នីមួយៗ នៅក្នុង Visual Basic បានកំនត់ទុកមុនជាមួយនឹង events ជាច្រើនសំរាប់ធ្វើការងារ។ Events ទាំងនេះត្រូវបាន listed ពេលដែលយើង select object name មួយនៅក្នុង Class Name list box ដែលវាស្ថិតនៅលើបំផុតនៃ Code Editor ហើយបន្ទាប់ click ត្រង់ Method Name arrow។

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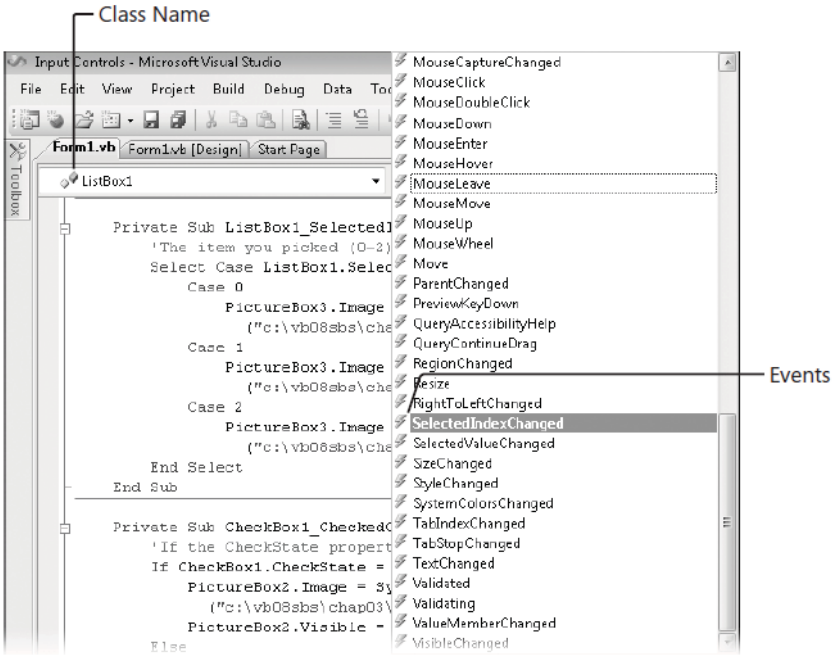
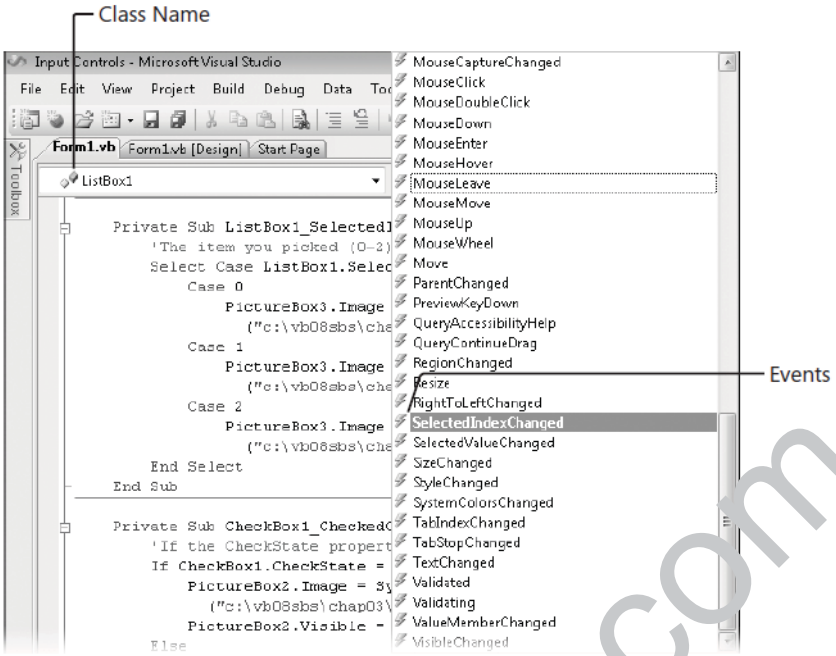
2. Event Supported by Visual Basic Objects



2. Event Supported by Visual Basic Objects



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3. Using Conditional Expressions

- Conditional Expression គឺជាផ្នែកមួយដែលជួយអោយ program statement អាច complete ដែលវាសួរដើម្បីយកតំលៃ True ឬ False របស់ property, variable, ឬ another piece នៃ data នៅក្នុង program code។
- Ex: Price < 100

  លទ្ធផលនឹង True ប្រសិនបើ Variable មានតំលៃ តូចជាង 100, ប៉ុន្តែលទ្ធផលនឹង False ប្រសិនបើតំលៃធំជាងឬស្មើ 100។

3.1. Comparison Operators in Conditional Expressions

Comparison Operator	Meaning
=	Equal to
<>	Not equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

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3.1. Comparison Operators in Conditional Expressions

- តារាងខាងក្រោមនេះនឹងបង្ហាញពី Conditional Expressions និង result របស់វា:

Comparison Expression	Result
10 <> 20	True (10 is not equal to 20)
Score < 20	True if Score is less than 20; otherwise, False
Score = Label1.text	True if the Text Property of the Label1 Object contains the same value as the Score variable; otherwise, False
TextBox1.Text="Bill"	True if word "Bill" is in the TextBox1 object; otherwise, False

4. If...Then Decision Structures

- If...Then decision structure គឺត្រូវបានប្រើដើម្បី ធ្វើការកំនត់លក្ខខណ្ឌ (evaluate condition) នៅក្នុង program ដោយផ្អែកទៅលើ conditional expression ។
- នៅក្នុងទំរង់ធម្មតា If...Then decision structure ត្រូវបានសរសេរជា single line។

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4. If...Then Decision Structures

If *Condition* Then *statement*

Condition = Conditional Expression

Statement = Valid VB program statement

Ex:

If Score >=20 Then Label1.Text="You win!"

If...Then decision structure បានប្រើប្រាស់ conditional expression គឺ:

Score >=20

4.1. Testing Several Conditions in an If...Then Decision Structure

```
If condition1 Then
   statements executed if condition1 is True
ElseIf condition2 Then
   statements executed if condition2 is True
[Additional ElseIf conditions and statements can be placed here]
Else
 statements executed if none of condition is
   True
End If
```

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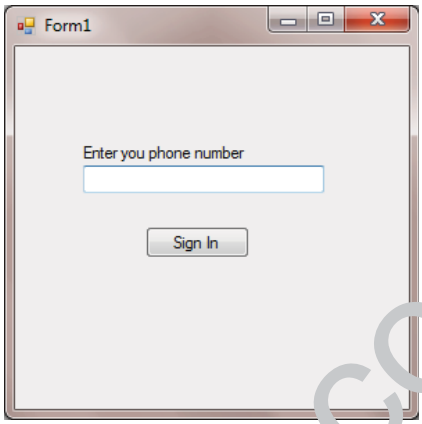
4.1. Testing Several Conditions in an If...Then Decision Structure

```
Dim Score As Single = TextBox1.text
If Score >=90 Then
    MsgBox( “A”)
ElseIf Score >=80 Then
    MsgBox( “B”)
ElseIf Score >=70 Then
    MsgBox( “C”)
ElseIf Score >=60 Then
    MsgBox( “D”)
ElseIf Score >=50 Then
    MsgBox( “E”)
Else
    MsgBox(“F”)
End If
```

5. Using MaskedTextBox Control

- MaskedTextBox Control គឺជាប្រភេទ Textbox មួយដែលទទួលយកតំលៃ Input ពី user នៅក្នុងទំរង់ format ជាក់លាក់ណាមួយ។
- ខាងក្រោមនេះជាការបង្កើត Form ជាមួយនឹង MaskedTextBox រួមទាំងការប្រើប្រាស់ If...Then Decision Structure:



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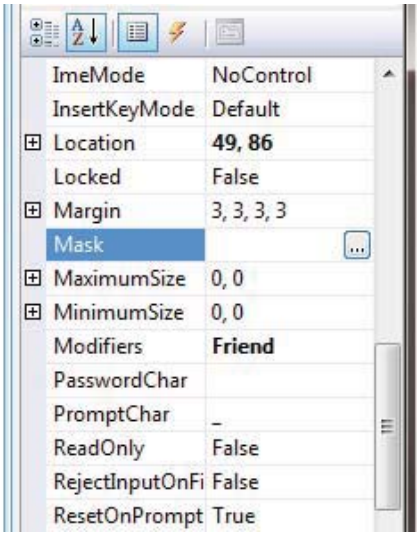
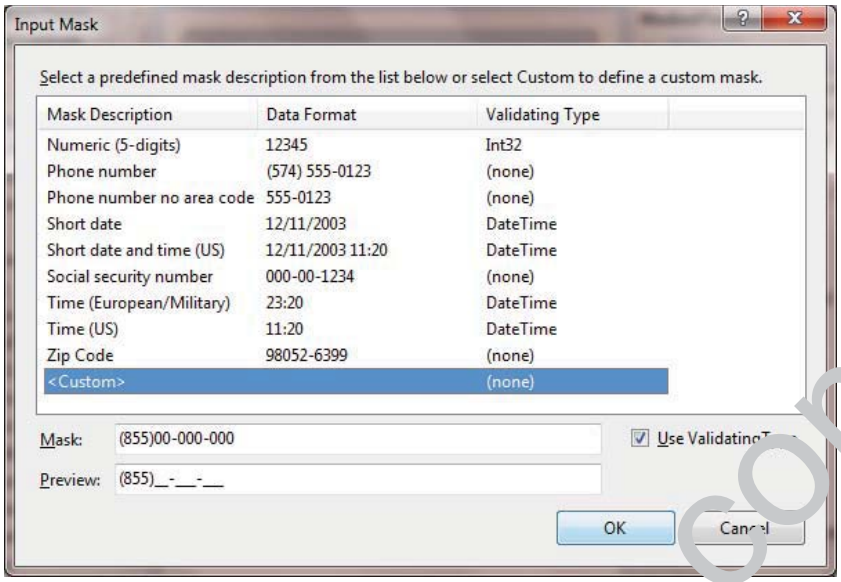
5. Using MaskedTextBox Control

1. Select on MaskedTextBox1 >
2. In Mask Property Click Ellipses Button >



5. Using MaskedTextBox Control

3. Choose Custom and Set your own format >
4. Click OK Button >



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5. Using MaskedTextBox Control

5. Double Click on Button Sign In and Code it:

```
If MaskedTextBox1.Text = “(855)13-603-314” Then
    MsgBox(“Welcome to the system”)
Else
    MsgBox(“I don“t recognize this number”)
End If
```

6. Using Logical Operators in Conditional Expressions

- យើងប្រើប្រាស់ Logical Operators ដើម្បីភ្ជាប់ conditions ច្រើនជាមួយគ្នានៅក្នុង If...Then និង ElseIf ដើម្បីធ្វើការដាក់លក្ខខណ្ឌបន្ថែមទៀតបានផងដែរ។

Logical Operators	Meaning
And	If both conditional expressions are True, then the result is True.
Or	If either conditional expression is True, then the result is True.
Not	If the conditional expression is False, then the result is True. If the conditional expression is True, then the result is False.
Xor	If one and only one of the conditional expressions is True, then the result is True. If both are True or both are False, then the result is False. (Xor stands for exclusive Or.)

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6. Using Logical Operators in Conditional Expressions

- ពេលដែល program ធ្វើការពិនិត្យទៅលើ complex expression ដែលមាន operator types ជាខុសៗគ្នានោះ វានឹងដំនើការការងារជាមួយ mathematical operators ទី 1, comparison operator ទី 2, និង logical operators ទី 3។
- តាមឧទាហរណ៍ខាងក្រោមយើង assumed ថា string variable មួយឈ្មោះ Vehicle មានតំលៃគឺពាក្យ “Bike” និង integer variable មួយឈ្មោះ Price មានតំលៃ 200។

Logical Expression	Result
Vehicle=“Bike” And Price < 300	True (both conditions are True)
Vehicle=“Car” Or Price <500	True(one condition is True)
Not Price < 100	True (condition is False)
Vehicle =“Bike” Xor Price<300	False (both conditions are True)

7. Using And Operator

1. Create the form interface as the following format >

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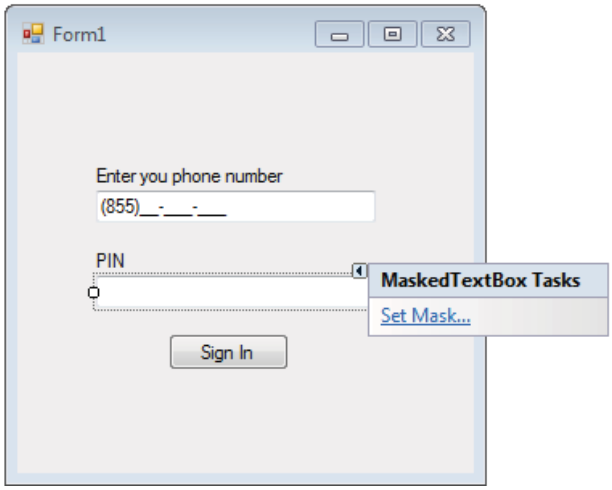
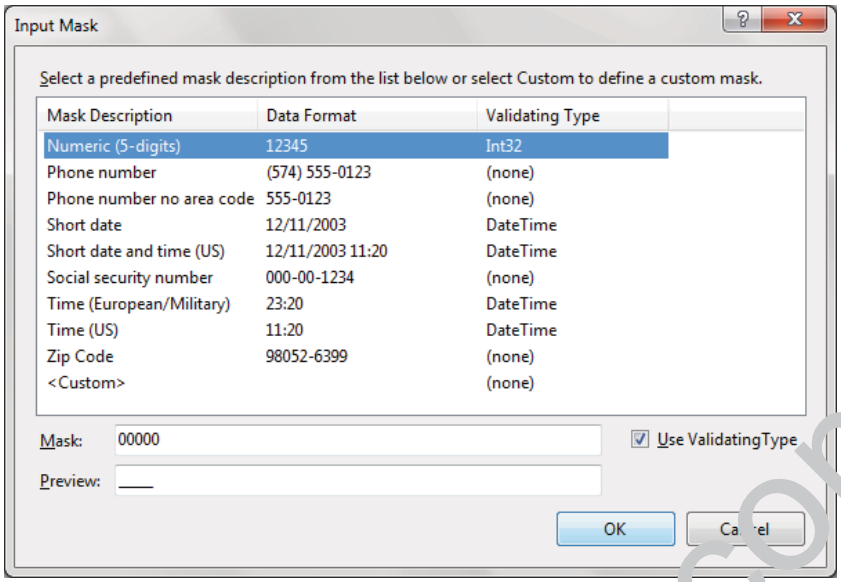
7. Using And Operator

2. Select on MaskedTextBox2 object and click the shortcut arrow to open the MaskedTextBox >
3. Click on Set Mask >



7. Using And Operator

4. Choose Numeric (5-digits) and Click OK>



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7. Using And Operator

5. Modify the following code in Sign In Button >

```
If MaskedTextBox1.Text = "(855)13-603-314" And _
   MaskedTextBox2.Text = "54321" Then
   MsgBox("Welcome to the system")
Else
   MsgBox("I don"t recognize this number")
End If
```

8. Using AndAlso and OrElse

- AndAlso = And Operator
- OrElse = Or Operator

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9. Select Case Decision Structures

- យើងប្រើប្រាស់ Select Case Decision Structures ដើម្បីកំនត់លក្ខខណ្ឌដូចទៅនឹង If...Then...ElseIf structure ផងដែរ ហើយវាមានសមត្ថភាពខ្ពស់នៅពេលពិនិត្យមើលលក្ខខណ្ឌជាមួយនឹង variable ដែលមានតំលៃម្ដងៗ ជាពិសេសវាជួយឲ Program Code មានភាពងាយស្រលក្នុងការ read ផងដែរ។

```
Select Case variable
    Case value 1
        Statement executed if value1 matches variable
    Case value 2, value3
        Statement executed if value2 matches variable
    ...
    Case Else
        Statement executed if no match is found
    End Select
```

9. Select Case Decision Structures

```
Dim Age As Integer = 25
Select Case Age
    Case 16
        Label1.text = “You can drive now!”
    Case 18
        Label1.text = “You can vote now!”
    Case 21 , 23
        Label1.text = “You can drink wine now!”
    Case 65
        Label1.text = “Time to retire and have fun!”
    Case Else
        Label1.text = “You‟re great age! Enjoy it!”
    End Select
```

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9.1. Using Comparison Operators with Select Case Structure

```
Dim Age As Integer = 25
Select Case Age
    Case Is < 13
        Label1.text = “Enjoy your youth”
    Case 13 To 19
        Label1.text = “Enjoy your teens”
    Case 21
        Label1.text = “You can drink wine now!”
    Case Is > 100
        Label1.text = “Looking good!”
    Case Else
        Label1.text = “That‟s a nice age to be”
    End Select
```

9.2. Using Select Case Structure to Process Listbox

1. Create Form like the following form >

2. ng table >

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9.2. Using Select Case Structure to Process Listbox

2. Set their property like the following table >

Object	Property	Setting
Form1	Text	Case Greeting
Label1	Font Name Text	Times New Roman, Bold, 12-Point lblTitle International Welcome Program
Label2	Name Text	lblTextBoxLabel Choose a country
Label3	Font Name Text	10-Point lblCountry Country Selected
Label4	Autosize BorderStyle ForeColor Name Text	False Fixed3D Red lblGreeting (empty)
ListBox1	Name	lstCountryBox
Button1	Name Text	btnQuit Quit

9.2. Using Select Case Structure to Process Listbox

3. Double click on Form and code >

```
lstCoutryBox.Items.Add(“England”)
lstCoutryBox.Items.Add(“Germany”)
lstCoutryBox.Items.Add(“Mexico”)
lstCoutryBox.Items.Add(“Italy”)
```

4. Double click on Button and code >

```
End
```

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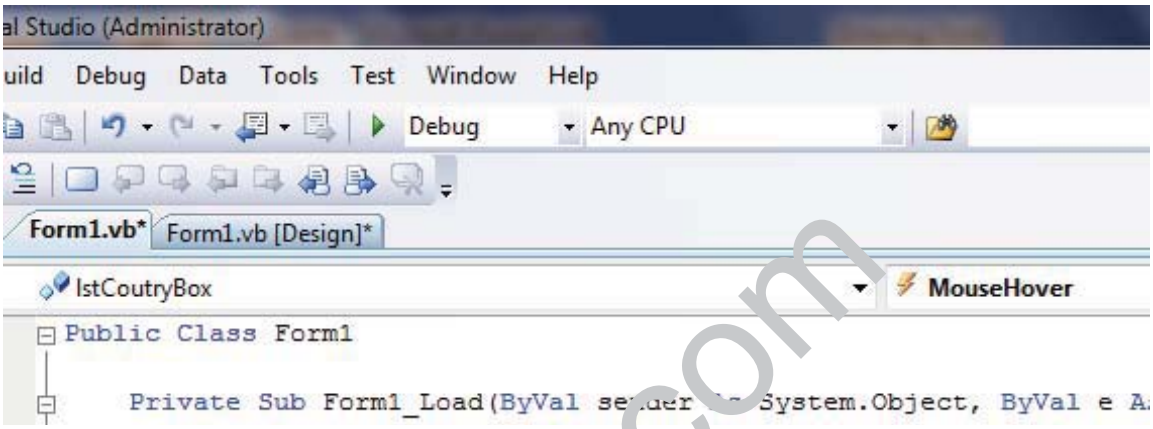
9.2. Using Select Case Structure to Process Listbox

5. Double click on listBox and code >

```
lblCountry.Text = lstCoutryBox.Text
 Select Case lstCoutryBox.SelectedIndex
    Case 0
       lblGreeting.Text = "Hello, programmer"
    Case 1
       lblGreeting.Text = "Hallo, programmierer"
    Case 2
       lblGreeting.Text = "Hola, prgramador"
    Case 3
       lblGreeting.Text = "Ciao,programmatore"
 End Select
```

10. Detecting Mouse Events

1. At the top the Code Editor, click the Class Name arrow and choose lstCountryBox object >
2. Click the Method Name arrow and then click the MouseHover event >



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10. Detecting Mouse Events

3. Write the program statement in the listCountryBox_MouseHover event procedure:

```
If lstCoutryBox.SelectedIndex < 0 Or _
 lstCoutryBox.SelectedIndex > 4 Then
    lblGreeting.Text = "Please click the country name"
 End If
```

Enter 07
Using Loops and Timers

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1. Writing For…Next Loops

- ជាមួយនឹង For...Next loop, យើងអាចធ្វើការ execute ន្លូវ program statements ជាក់លាក់ណាមួយជាច្រើនដងនៅក្នុង event procedure ។
- Syntax:

```
For variable = start To end
   Statements to be repeated
Next [variable]
```

1. Writing For...Next Loops

- Ex:

```
Dim I As Integer
For i = 1 To 4
    Beep()
Next i
```

- តាមឧទាហរណ៍ខាងលើ variable i ត្រូវបានហៅថា counter variable ដែលក្នុង For...Next Loop ត្រូវ declare ជា integer type។
- រាល់ពេលដែល loop ត្រូវបាន executed, នោះ counter variable គឺត្រូវបាន increase ឬដឹងមួយតំលៃ ផងដែរ។

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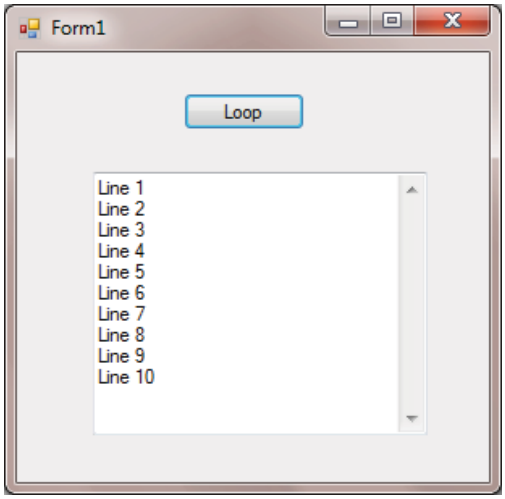
2. Displaying a Counter Variable in a TextBox Control

- Counter variable អាចត្រូវបាន assign តំលៃពី properties, ហើយប្រើដើម្បី calculate ឬ display នៅក្នុង code ។
- តាមឧទាហរណ៍ខាងក្រោមយើងនឹងបង្កើត Form មានទំរង់ដូចខាងក្រោម:



2. Displaying a Counter Variable in a TextBox Control

1. Create a Form names MyForLoop >
2. Draw a Button on Form and put it's text property is "Loop" >
3. Draw a TextBox on Form and it's
   > Multiline property set to True
   > ScrollBars property set to Vertical
4. Enlarge the textbox >

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2. Displaying a Counter Variable in a TextBox Control

5. Double Click on Loop Button and code:

```
Dim i As Integer
    Dim Wrap As String
    Wrap = vbCrLf
    'Wrap = Chr(13) & Chr(10)
    For i = 1 To 10
        TextBox1.Text = TextBox1.Text & "Line" & i & Wrap
    Next i
```

3. Char(number)

Dec	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	0	000	NUL (null)	32	20	040		Space	64	40	100	@	@	96	60	140	`	`
1	1	001	SOH (start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2	002	STX (start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3	003	ETX (end of text)	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	4	004	EOT (end of transmission)	36	24	044	$	$	68	44	104	D	D	100	64	144	d	d
5	5	005	ENQ (enquiry)	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	6	006	ACK (acknowledge)	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	7	007	BEL (bell)	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	8	010	BS (backspace)	40	28	050	(	(	72	48	110	H	H	104	68	150	h	h
9	9	011	TAB (horizontal tab)	41	29	051	)	)	73	49	111	I	I	105	69	151	i	i
10	A	012	LF (NL line feed, new line)	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
11	B	013	VT (vertical tab)	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
12	C	014	FF (NP form feed, new page)	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
13	D	015	CR (carriage return)	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
14	E	016	SO (shift out)	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
15	F	017	SI (shift in)	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
16	10	020	DLE (data link escape)	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
17	11	021	DC1 (device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
18	12	022	DC2 (device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
19	13	023	DC3 (device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
20	14	024	DC4 (device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
21	15	025	NAK (negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
22	16	026	SYN (synchronous idle)	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
23	17	027	ETB (end of trans. block)	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
24	18	030	CAN (cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
25	19	031	EM (end of medium)	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
26	1A	032	SUB (substitute)	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
27	1B	033	ESC (escape)	59	3B	073	;	;	91	5B	133	[	[	123	7B	173	{	{
28	1C	034	FS (file separator)	60	3C	074	<	<	92	5C	134	\	\	124	7C	174			|
29	1D	035	GS (group separator)	61	3D	075	=	=	93	5D	135	]	]	125	7D	175	}	}
30	1E	036	RS (record separator)	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
31	1F	037	US (unit separator)	63	3F	077	?	?	95	5F	137	_	_	127	7F	177	&#127;	DE

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3. Char(number)

Ex:

```
Dim i As String
Dim x As Integer
i = Chr(65)
MsgBox(i)
x = Asc("A")
MsgBox(x)
```

4. Creating Complex For…Next Loops

- រាល់ពេលដែល loop ត្រូវបាន executed, នោះ counter variable គឺត្រូវបាន increase ទ្បើងមួយតំលៃផងដែរ។
- យើងអាចប្រើប្រាស់ Step Keyword ដើម្បីធ្វើការincrease តំលៃរបស់ counter variable ទៅតាមតំរូវការ (2,5,-2) របស់យើងបានផងដែរ។

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4. Creating Complex For…Next Loops

- Ex:

```
Dim i As Integer
    Dim Wrap As String
    Wrap = vbCrLf
    'Wrap = Chr(13) & Chr(10)
    For i = 5 To 25 Step 5
        TextBox1.Text = TextBox1.Text & "Line" & i & Wrap
    Next i
```

4. Creating Complex For...Next Loops

- យើងក៏អាចកំនត់តំលៃ decimal ក្នុង loop បានផងដែរ។

```
Dim i As Integer
    Dim Wrap As String
    Wrap = vbCrLf
    'Wrap = Chr(13) & Chr(10)
    For i = 1 To 2.5 Step 0.5
        TextBox1.Text = TextBox1.Text & "Line" & i & Wrap
    Next i
```

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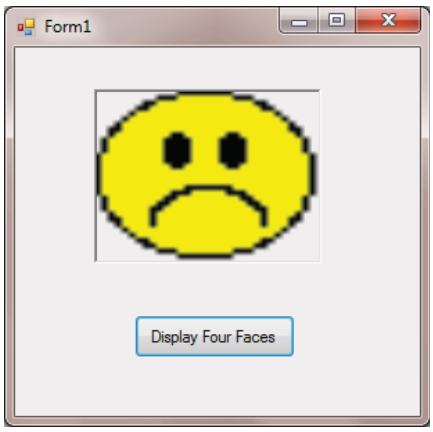
4.1. Creating MyForLoopIcons Project

Object	Property	Setting
PictureBox1	BorderStyle SizeMode	Fixed3D StretchImage
Button1	Text	Display Four Faces



4.1. Creating MyForLoopIcons Project

- Double Click on button1 and Code:

```
Dim i As Integer
    For i = 1 To 4
        PictureBox1.Image =System.Drawing _
     .Image.FromFile("face0" & i & ".ico")
        MsgBox("click here for next face.")
    Next
```

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5. Using a Counter That Has Greater Scope

```
Dim counter As Integer = 1
    Private Sub Button1_Click(---)
        PictureBox1.Image = System.Drawing. _
    Image.FromFile("face0" & counter & ".ico")
        MsgBox("click here for next face.")
        counter += 1
        If counter = 5 Then counter = 1
    End Sub
```

6. The Exit For Statement

- យើងប្រើប្រាស់ Exit For Keyword ក្នុង For...Next loop ដើម្បីបញ្ចប់ loop ទៅតាមលក្ខខ័ណ្ឌដែលត្រូវការ។
- Ex:

```
Dim i As Integer
Dim InpName As String
For i =1 To 10
   InpName = InputBox("Enter you name or type Done to quit.")
   If InpName = "Done" Then Exit For
   TextBox1.Text = InpName
Next i
```

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7. Writing Do Loops

- Do Loops គឺជាប្រភេទ Loops មួយផ្សេងទៀតដែលប្រើដើម្បី executes group of statements រហូតដល់ជួបលក្ខខ័ណ្ឌដែលកំនត់ឲ្យទើបឈប់។
- Do Loops មានសារៈប្រយោជន៍ នៅពេលដែលយើងប្រើប្រាស់ Loop នៅក្នុង Code ដោយមិនចាំបាច់កំនត់ពីចំនួន Loop ពិតប្រាកដ។
- Syntax:

```
Do While condition
    block of statements to be executed
Loop
```

7. Writing Do Loops

- Ex:

```
Dim InpName As String
Do While InpName <> “Done”
    InpName=InputBox(“Enter you name or type Done to quit.”)
    If InpName <> “Done” Then _
        TextBox1.text =InpName
Loop
```

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7. Writing Do Loops

- តាមឧទាហរណ៍ខាងលើ Do Loop គឺពិនិត្យលក្ខខណ្ឌមុនទើបដំនើការ code ជាក្រោយ មានន័យថាប្រសិនបើ InpName = “Done” នោះ គឺ Loop នេះនឹងត្រូវបានបញ្ចប់មុនពេលដំនើការ code នៅក្នុងនោះ។
- ក្នុងករណីដែលយើងចង់ឲ Loop អាច run យ៉ាងតិចម្តងដែរនៅក្នុង program នោះសូមដាក់ conditional test នៅផ្នែកខាងក្រោមជាមួយនឹង Loop Keyword។

7. Writing Do Loops

- Syntax:

```
Do
    Block of statements to be executed
Loop While condition
```

- Ex:

```
Dim InpName As String
Do
    InpName=InputBox("Enter your name or type Done to quit.")
    If InpName <> "Done" Then _
        TextBox1.text =InpName
Loop While InpName <> "Done"
```

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8. Avoiding an Endless Loop

- ក្នុងការប្រើប្រាស់ Do Loop គឺត្រូវកំនត់ឲវាមានចំនុច False មួយ សំរាប់ចាកចេញពី Loop ពុំដូច្នោះទេ Do Loop នឹងធ្វើការ Loop ដោយគ្មានទីបញ្ចប់។
- Ex:

```
Dim Number As Double
Do
   Number = InputBox("Enter a number to square.
   Type -1 to quit.")
   Number = Number * Number
   TextBox1.Text = Number
Loop While Number >=0
```

8.1. Convert temperatures by using a Do loop

1. Create a Project named MyCelsiusConversion >
2. Code in Form1_Load event prcedure >

```
Dim FTemp, Celsius As Single
Dim strFTemp As String
Dim Prompt As String = "Enter a Fahrenheit temperature."
Do
   strFTemp = InputBox(Prompt, "Farenheit to Celsius")
   If strFTemp <> "" Then
      FTemp = CSng(strFTemp)
      Celsius = Int((FTemp + 40) * 5 / 9 - 40)
      MsgBox(Celsius, , "Temperature in Celsius")
   End If
Loop While strFTemp <> ""
End
```

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8.1. Convert temperatures by using a Do loop

1. Create a Project named MyCelsiusConversion >
2. Code in Form1_Load event prcedure >

```
Dim FTemp, Celsius As Single
Dim strFTemp As String
Dim Prompt As String = "Enter a Fahrenheit temperature."
Do
   strFTemp = InputBox(Prompt, "Farenheit to Celsius")
   If strFTemp <> "" Then
      FTemp = CSng(strFTemp)
      Celsius = Int((FTemp + 40) * 5 / 9 - 40)
      MsgBox(Celsius, , "Temperature in Celsius")
   End If
Loop While strFTemp <> ""
End
```

8.2. Using the Until Keyword in Do Loops

- While Keyword គឺត្រូវបានប្រើដើម្បី execute group of statements នៅពេល លក្ខខណ្ឌ True ។
- ចំពោះ Until Keyword វិញ ក៏ត្រូវបានប្រើប្រាស់ផងដែរដើម្បី execute group of statemnts រហូតដល់លក្ខខណ្ឌ True ទើបឈប់។

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8.2. Using the Until Keyword in Do Loops

- Ex:

```
Dim InpName As String
Do
   InpName = InputBox("Enter your name
   or type Done to quit.")
   If InpName <> "Done" Then TextBox1 _
   .text = InpName
Loop Until InpName = "Done"
```

9. The Timer Control

- Timer Control គឺត្រូវបានប្រើប្រាស់ដើម្បីធ្វើការ execute a group of statements នៅ ក៏ឡុងពេលជាក់លាក់ណាមួយ។
- Timer Control អាចប្រើដើម្បីកំនត់ជា count down time, delay in a program, ឬ repeat an action,...

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9.1. Creating a Digital Clock by Using a Timer Control

1. Create a MyDigitalClock Project >
2. Create some objects and set their property as the following table >

Object	Property	Setting
Label1	AutoSize Font Text TextAlign	False Times New Roman,Bold, 24-point (empty) MiddleCenter
Timer1	Enabled Interval	True 1000
Form1	Text	Digital Clock

9.1. Creating a Digital Clock by Using a Timer Control

3. Double click on timer object and code:

```
Label1.Text = TimeString
'System.DateTime.Now
```

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10. Using a Timer Object to Set a Time Limit

1. Create a Project named MyTimedPassword >
2. Create the following objects >

Object	Property	Setting
Label1	Text	Enter you password within 15 seconds
TextBox1	PasswordChar	*
Button1	Text	Try Password
Timer1	Enabled Interval	True 15000
Form1	Text	Password

10. Using a Timer Object to Set a Time Limit

3. Double click on Timer object and code:

```
MsgBox("Sorry, your time is up.")
  End
```

4. Double click on Button object and code:

```
If TextBox1.Text = "Enter Center" Then
    Timer1.Enabled = False
    MsgBox("Welcome to the system!")
    End
Else
    MsgBox("Sorry, friend, I don't know you.")
End If
```

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11. Inserting Code Snippets

- Snippets command អាចឲយើងធ្វើការ insert ready-made code templates នៅក្នុង Code Editor។
- Ex:

1. Create Project named MyWindowVersion >
2. Draw a Button in Form and set the Text property is “Display Windows Version” >

11. Inserting Code Snippets

8. After finish Snippet convert to following code:

```
Dim osVersion As String
    osVersion = My.Computer.Info.OSVersion
```

9. Change previous code to this code:

```
Dim osVersion, osName As String
    osVersion = My.Computer.Info.OSVersion
    osName = My.Computer.Info.OSFullName
    MsgBox(osName & vbCr & osVersion)
```

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11. Inserting Code Snippets

3. Double click on Button object >
4. Place Cursor in Button1_Event and Click Edit Menu > IntelliSense > Insert Snippet >
5. Double click on Windows System-Logging, Processes, Registry, Services folder >
6. Double click on Windows é System Folder >
7. Double click on Determine the Current

Enter 08
Creating Modules and Procedures

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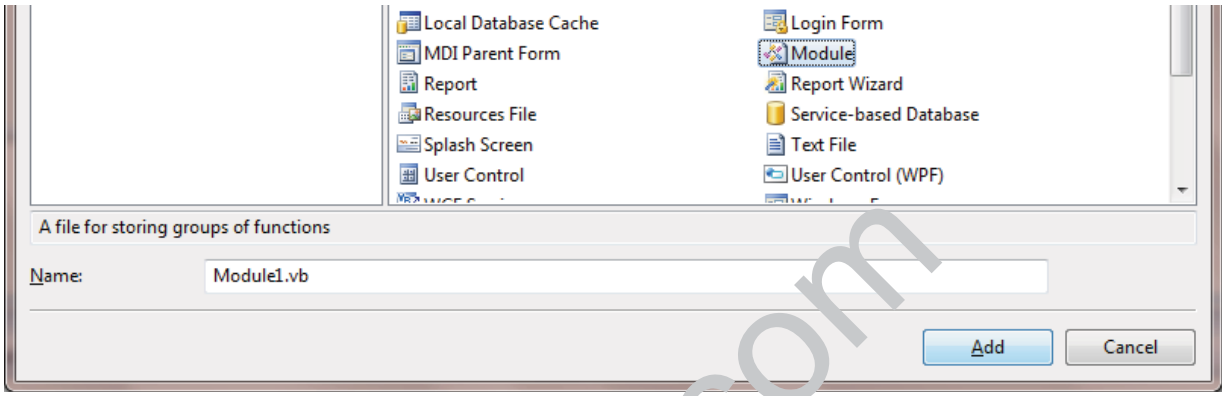
1.Modules Definition

- Module គឺជា Special File ដែលវាអាចផ្ទុកនូវ variables, function, ឬ procedures ជាច្រើនទៀតដើម្បីប្រើប្រាស់ក្នុង Project ទាំងមូល។
- នៅក្នុង VB 8, Extension របស់ Module គឺ *.vb ខុសពី Module ក្នុង VB 6 គឺ *.bas
- Module ត្រូវបាន List នៅក្នុង Solution Explorer ដូច Form ដែរ ប៉ុន្តែក្នុង Module គឺមានតែ Code ប៉ុណ្ណោះ (វាមិនមាន GUI នោះទេ)

2. Creating Modules

1. Create a project named MyModuleTest >
2. Click Project Menu > Add New Item >
3. Select Module > Click Add Button >



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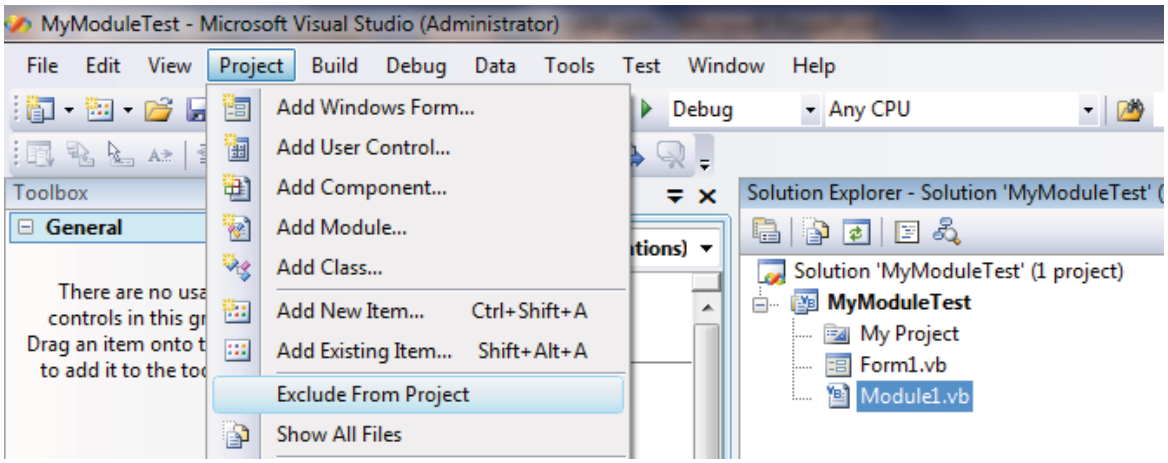
3. Exclude Modules From Project

1. Select on Module name >
2. Click Project Menu > Exclude From Project >



4. Include Modules To Project

1. Click Project Menu > Add Existing Item >
2. Choose the location of Module and Select it >
3. Click Add button to bring Module in Project with form.

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5. Creating Procedures in Module

- Procedures គឺជាអ្នកកំនត់ន្ធវក្រមនៃ code statements ឲធ្វើការងារជាក់លាក់ណាមួយ ដែលក្នុងនោះត្រូវបានបែងចែកជាពីរប្រភេទមានដូចជា:
  - Function Procedures: គឺប្រើប្រាស់ដើម្បី calculation ដែលវា receive arguments ហើយតែងតែ return value ជានិច្ច។
  - Sub Procedures: គឺប្រើប្រាស់ដើម្បី process input, display output, ឬ set property.
- Function procedures និង Sub procedures ក៏អ្នាចបង្កើតនៅក្នុង Form បានផងដែរ ប៉ុន្តែភាគច្រើនគឺនិយមបង្កើតវានៅក្នុង Module វិញ ព្រោះវាមាន Score ធំជាងដោយអាចប្រើប្រាស់វានៅក្នុង Project ទាំងមូល។

6. Writing Function Procedures

- Function Procedure គឺជា group of statements ដែលស្ថិតនៅក្នុងចន្លោះ Function និង End Function។
- Statement នៅក្នុង Function គឺធ្វើការដូចជា output, input, calculation,...
- យើងអាច execute ឬ call function ដោយធ្វើការសរសេរ function name និងដាក់ arguments ទៅតាមចំនួនដែលកំនត់ឲ។
- Arguments គឺជា data ដែលប្រើដើម្បីឲ function ដំនើរការដោយពួកវាត្រូវបានដាក់នៅក្នុង parentheses () ហើយបែងចែកដោយ comma ,

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6. Writing Function Procedures

- Syntax:

```
Function FuncName([arg]) As Type
        function statements
        [Return value]
End Function
```

- Ex:

```
Function TotalTax(ByVal Cost as Single) As Single
        Dim StateTax, CityTax As Single
        StateTax=Cost * 0.05
        CityTax = Cost * 0.015
        Return StateTax + CityTax
End Function
```

6. Writing Function Procedures

- Calling Function Proceure:

```
lblTaxes.Text = TotalTax(500)
```

Or

```
Dim TotalCost, SalesPrice As Single
SalesPrice = 500
Total = SalesPrice + TotalTax(SalesPrice)
```

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7. Writing Sub Procedures

- Sub Procedure គឺជា group of statements ដែលស្ថិតនៅក្នុងចន្លោះ Sub និង End Sub ។
- Statement នៅក្នុង Function គឺធ្វើការងារជាក់ជា display ឬ output information, get input ពី user,
- Syntax:

```
Sub ProcedureName ([arg])
        procedure statements
End Sub
```

7. Writing Sub Procedures

- Ex:

```
Sub BirthdayGreeting (ByVal Person As String)
    Dim Msg As String
    If Person <>"" Then
        Msg="Happy birthday"&Person&"!"
    Else
        Msg="Name not specified."
    End If
    MsgBox(Msg, , "Best Wishes")
End Sub
```

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7. Writing Sub Procedures

- Call Sub Procedure:

```
BirthdayGreeting ("Robert")
```

Or

```
Dim NewName As String
Do
    NewName = InputBox("Enter a name for _
    greeting.", "Birthday List")
    BirthdayGreeting(NewName)
Loop Until NewName=""
```

8. Public Variable

- Public Variable គឺអាចប្រើប្រាស់ទាំងក្នុង Module ខ្លួនឯងផង និងនៅក្នុង Form បានផងដែរ។
- Ex: Public Msg As String
- Private Variable គឺអាចប្រើប្រាស់តែនៅផ្នែកខាងក្នុង Module ខ្លួនឯងផង ដោយមិនអាចប្រើនៅក្នុង Form បានទេ។
- Ex: Private Msg As String

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8. Public Variable

- Public និង Private Keyword ត្រូវបានប្រើសំរាប់កំនត់ Score ទៅឲ Variable ហើយក៏អាចកំនត់ Score ទៅឲ Function Procedure ឬ Sub Procedure បានផងដែរ។
- Ex: Private Function Sum (---)
- Ex: Public Sub Add(---)

9. Passing Argument by Value and by Reference

- នៅក្នុង Function ឬ Sub Procedure, arguments ដែលបាន pass ទៅត្រូវបានចែកចេញជាពីរប្រភេទដូចជា ByVal និង ByRef ។
- ByVal Keyword គឺសំរាប់កំនត់ឲ argument ដែលត្រូវ pass ទៅក្នុង procedure តាមរយៈ value របស់វា មានន័យថានៅពេលដែល តំលៃរបស់ variable ដែលបាន pass មានភាពប្រែប្រួលនោះ គឺវាមិនបាន pass back ត្រលប់មកវិញ នៅពេល call procedure នោះទេ។

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9. Passing Argument by Value and by Reference

- ByRef Keyword គឺសំរាប់កំនត់ឲ argument ដែលត្រូវ pass ទៅក្នុង procedure តាមរយៈ reference របស់វា មានន័យថានៅពេលដែលតំលៃរបស់ variable ដែលបាន pass មានភាពប្រែប្រួលនោះ គឺវានឹងធ្វើការ pass back ត្រលប់មកវិញ នៅពេល call procedure ។

9. Passing Argument by Value and by Reference

```
Sub CostPlusInterest(ByRef Cost As Single, _
                     ByRef Total As Single)
    Cost = Cost * 1.05 'Add 5% to cost
    Total = Int(Cost) 'make integer and return
End Sub
-----------------------------------------------------------------
Dim  Price, TotalPrice As Single
Price = 100
TotalPrice=0
CostPlusInterest(Price, TotalPrice)
MsgBox(Price & "at 5% interest is " & TotalPrice)
```

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9. Passing Argument by Value and by Reference

```
Sub CostPlusInterest(ByVal Cost As Single, _
                     ByRef Total As Single)
    Cost = Cost * 1.05 'Add 5% to cost
    Total = Int(Cost) 'make integer and return
End Sub
-----------------------------------------------------------------
Dim  Price, TotalPrice As Single
Price = 100
TotalPrice=0
CostPlusInterest(Price, TotalPrice)
MsgBox(Price & "at 5% interest is " & TotalPrice)
```

Enter 09
Using Arrays

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1.What is Arrays?

- Array គឺជា series of elements ដែលមាន Data Type ដូចគ្នា រៀបតាមលំដាប់នៅក្នុង Memory Location ដែលមាន index មួយៗ ដើម្បីសំគាល់ពីទីតាំងរបស់ element នីមួយៗ។
- ប្រភេទរបស់ Array មានដូចជា:
  - Fixed-Size Array
  - Dynamic Array

2. Creating an Array

- ក្នុងការបង្កើត ឬ declare Array នៅក្នុង Program គឺមានលក្ខណៈដូចគ្នាទៅនឹងការ declare variable ដែរ ហើយចំពោះការកំនត់ Scope របស់ Array ក៏ដូចនឹង Variable ផងដែរៗ

Information in an array declaration statement	
Array Name	ត្រូវដាក់ដូច Variable Rule ដែរ
Data Type	ប្រើប្រាស់ Data Type ដូចនឹង variable ដែរ
Number of dimensions	ជាចំនួន វិមាត្រ (Dimensions) ដែលត្រូវបង្កើត
Number of elements	ជាចំនួនធាតុ (Elements) ដែលត្រូវបង្កើតក្នុង Array

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3. Fixed-Size Array

- Fixed-Size Array គឺជា Arrays ដែលមានចំនួន elements ពិតប្រាកដ នៅពេល declare ។
- Syntax:

  Dim ArrayName(dimension) As DataType
- Ex:

  Dim Employees(9) As String

  Public Employee(9) As String

3. Fixed-Size Array

- ពេលដែលបង្កើត Employee Array ដែលមាន 10 elements នោះ នៅក្នុង Memory Location នឹងត្រូវបាន sets aside room សំរាប់ Array 10 គឺចាប់ពី index 0 ដល់ index 9 ។

- យើងអាចប្រកាស

  – Dim Employees(9) As String

  Or Dim Employees(0 To 9) As String

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3.1.Working with Array Elements

- ដើម្បីធ្វើការ Assign Value ទៅ element នៃ Array នោះគឺយើងត្រូវប្រើប្រាស់ឈ្មោះរបស់ array និង index របស់វា។
- Ex: Employee(5) = “Leslie”

0	1	2	3	4	5	6	7	8	9
					Leslie				

- Index ត្រូវតែជា integer ឬជា expression ដែលផ្តល់ result ជា integer (5, num -1)

3.2.UBound and LBound Functions

- UBound (Upper Bound) function គឺត្រូវបានប្រើសំរាប់ check រក top index value នៃ array ។
- Ex: UBound(ArrayName)
- LBound (Lower Bound) function គឺត្រូវបានប្រើសំរាប្តី check រក lower index value នៃ array ហើយជាទូទៅ LBound function គឺ return 0 ព្រោះ index array start ពី 0 ។
- Ex: LBound(ArrayName)

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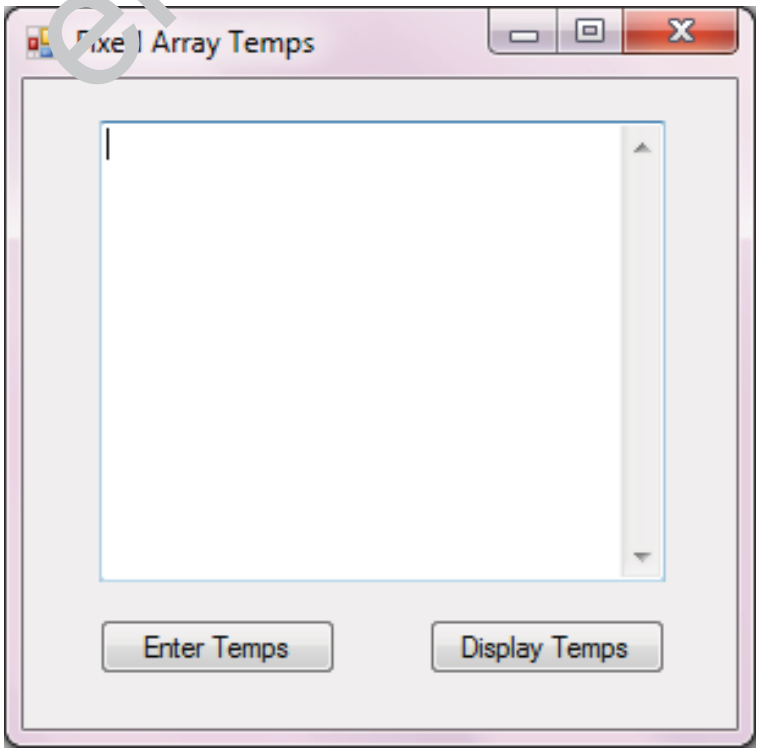
3.3.Sample Fixed-Size Array



3.3.Sample Fixed-Size Array

1. Create a project named FixedArrayTemps >
2. Create object as the following table >

Object	Property	Setting
TextBox1	ScrollBars	Vertical
Button1	Text	Enter Temps
Button2	Text	Display Temps
Form1	Text	Fixed Array Temps

3. Complete the code in some area >

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3.3.Sample Fixed-Size Array

- Code bellow Public Class Form1:

```
Dim Temperatures(0 To 6) As Single
```

- Code in Enter Temps Button:

```
    Dim Prompt, Title As String
    Dim i As Short
    Prompt = "Enter the day's high temperature."
    For i = 0 To UBound(Temperatures)
    Title = "Day " & (i + 1)
    Temperatures(i) = InputBox(Prompt, Title)
Next
```

3.3.Sample Fixed-Size Array

- Code in Display Temps Button:

```
Dim Result As String
Dim i As Short
Dim Total As Single = 0
Result = "High temperatures for the week:" & vbCrLf & vbCrLf
For i = 0 To UBound(Temperatures)
   Result = Result & "Day " & (i + 1) & vbTab & _
     Temperatures(i) & vbCrLf
   Total = Total + Temperatures(i)
Next
Result = Result & vbCrLf & _
  "Average temperature:  " & Format(Total / 7, "0.0")
TextBox1.Text = Result
```

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4. Creating a Dynamic Array

- Dynamic Array គឺជាប្រភេទ Array ដែលត្រូវបានបង្កើតឡើងដោយមិនចាំបាច់កំនត់ពីចំនួនឡើយ។
- ចំពោះចំនួន element របស់វាវិញ គឺអាចត្រូវបានកំនត់នៅពេល run time ។ឧទាហរណ៏យើងអាចបង្កើត InputBox ឬ TextBox សំរាប់ឲ users ធ្វើការបញ្ចូល។

4. Creating a Dynamic Array

- ដើម្បីបង្កើត Dynamic Array នោះ:

1. កំនត់ឈ្មោះរបស់ array និង type របស់វាប៉ុន្តែ មិនចាំបាច់កំនត់ dimesion របស់វានោះទេ

   Ex: Dim Temperatures() As Single

2. Add code មួយចំនួនដើម្បីធ្វើការកំនត់ចំនួន elements របស់ array នៅពេល run time ។

   Ex: Dim Day As Short

   Days=InputBox("How many days","Create Array")

3. ប្រើប្រាស់ Redim Keyword ដើម្បីកំនត់ពី dimension របស់ array។ ឃក់ Variable ដែលធ្វើការ dimension ដក 1 ចេញ

   Ex: ReDim Temperatures(Days - 1)

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4.1. Creating a Dynamic Array

- Open code Editor to display FixedArrayProject >
- Code below Public Class Form1:

  Dim Temperatures(~~0 To 6~~) As Single

  Dim Days As Integer

- Code in Enter Temps Button:

```
Dim Prompt, Title As String
Dim i As Short
Prompt = "Enter the day‟s high temperature.“
If Days > 0 The ReDim Temperatures(Days - 1)
For i = 0 To UBound(Temperatures)
 Title = "Day " & (i + 1)
 Temperatures(i) = InputBox(Prompt, Title)
Next
```

4.1. Creating a Dynamic Array

- Code in Display Temps Button:

```
 Dim Result As String
Dim i As Short
Dim Total As Single = 0
Result = "High temperatures for the week:" & vbCrLf & vbCrLf
For i = 0 To UBound(Temperatures)
   Result = Result & "Day " & (i + 1) & vbTab & _
     Temperatures(i) & vbCrLf
   Total = Total + Temperatures(i)
Next
Result = Result & vbCrLf & _
  "Average temperature:  " & Format(Total / Days, "0.0")
TextBox1.Text =Result
```

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5. Using ReDim Preserve

- យើងប្រើប្រាស់ ReDim ដើម្បីកំនត់ចំនួន element ពិតប្រាកដទៅឲ Dynamic Array នៅពេល Run time។ ក្នុងករណីដែលយើងធ្វើការ ReDim ឡើងវិញជាមួយនឹង Array ដែលមាន data រួចរាល់ហើយនោះ នោះវានឹងលុបចោលនូវទិន្នន័យរបស់ Array មុនៗចោលទាំងអស់។
- យើងប្រើប្រាស់ ReDim Preserve ដើម្បីធ្វើការរក្សាទុកនូវទិន្នន័យមុនៗនៅក្នុង array មិនឲបាត់បង់ នៅពេលធ្វើការផ្លាស់ប្តូរ dimension របស់វា។
- Syntax:

  ReDim Preserve ArrayName(Dimension)

5. Using ReDim Preserve

```
Public Class Form1
    'First Fixed-Size Array with 3 elements
    Dim Fruit() As String = {"Apple", "Banana", "Coco"}
    Private Sub Form1_Load(---)
        Dim i As Short
        'Show first Fixed-size array
        For i = 0 To UBound(Fruit)
            MsgBox(Fruit(i))
        Next
```

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5. Using ReDim Preserve

```
'recreate array with 5 element (index in ReDim start with 0 - 4)
        ReDim Fruit(4)
        Fruit(0) = "Ant"
        Fruit(1) = "Bull"
        Fruit(2) = "Cat"
        Fruit(3) = "Dog"
        Fruit(4) = "Elephant"
        'Show Second array
        For i = 0 To UBound(Fruit)
            MsgBox(Fruit(i))
        Next
```

5. Using ReDim Preserve

```
'recreate array with 8 element (index in ReDim start with 0 - 8)
        ReDim Preserve Fruit(7)
        Fruit(5) = "Fish"
        Fruit(6) = "God"
        Fruit(7) = "Human"
        'Show third array
        For i = 0 To UBound(Fruit)
           MsgBox(Fruit(i))
        Next
        End
    End Sub
End Class
```

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6. Two-Dimensional Arrays

- Two-Dimensional Arrays គឺជា array ដែលមានវិមាត្រ (Dimension) ចំនួន 2 ។
- Syntax: Dim ArrayName(rowdim,coldim) As Type
- Ex: Dim Scoreboard(1,4) As Short
- Or: Dim Scoreboard(0 To 1, 0 To 4) As Short

6. Two-Dimensional Arrays

- Scoreboard(0,2) = 4

		4		

- Dim Student(,) As String = _
  {{“Boy”,”1990”,”M”},{“Girl”,”1991”,”F”}}

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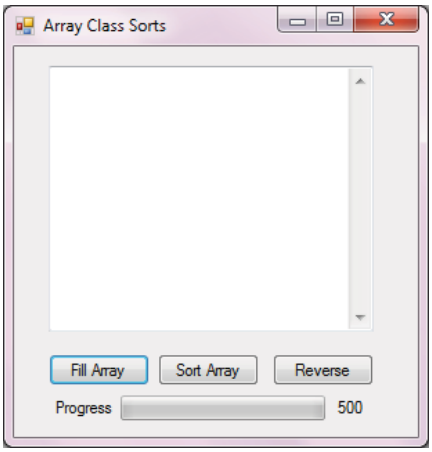
7. Using Methods in Array Class



7. Using Methods in Array Class

- Code in Public Class Form1:

```
Dim RandArray(0 To 499) As Long
```

- Code in Form1_Load:

```
ProgressBar1.Minimum = 0
ProgressBar1.Maximum = _
UBound(RandArray)
Label2.Text = UBound(RandArray) + 1
```

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7. Using Methods in Array Class

- Code in Button1:

```
Dim i As Integer
        For i = 0 To UBound(RandArray)
    RandArray(i) = Int(Rnd() * 1000000)
    TextBox1.Text = TextBox1.Text & RandArray(i) & vbCrLf
    ProgressBar1.Value = i  'move progress bar
Next i
```

- Code in Button2:

```
Dim i As Integer
        TextBox1.Text = ""
        Array.Sort(RandArray)
For i = 0 To UBound(RandArray)
        TextBox1.Text = TextBox1.Text & RandArray(i) & vbCrLf
        ProgressBar1.Value = i  'move progress bar
Next i
```

7. Using Methods in Array Class

- Code in Button3:

```
Dim i As Integer
TextBox1.Text = ""
Array.Reverse(RandArray)
For i = 0 To UBound(RandArray)
TextBox1.Text = TextBox1.Text & RandArray(i) & vbCrLf
   ProgressBar1.Value = i  'move progress bar
Next i
```

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Enter 10
Develop File Setup

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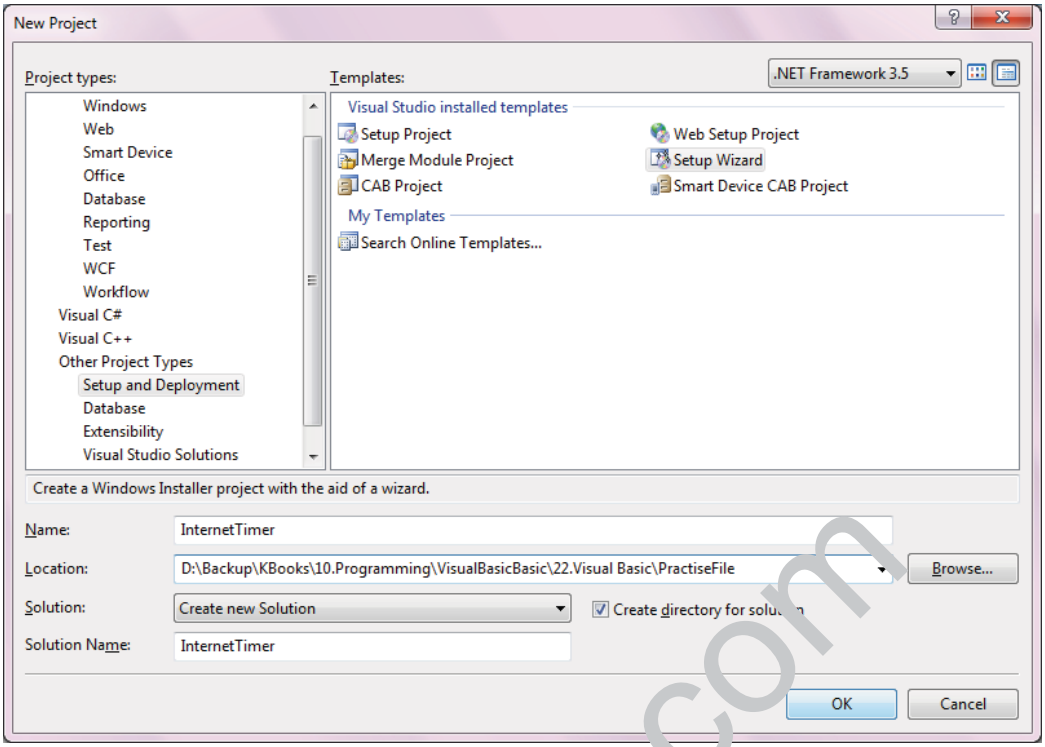
1. Create File Setup

1. Click File > New > Project >
2. Choose Other Project Types and select Start up and Deployment >
3. In Template Box choose Setup Wizard >
4. Put the name and location then Click OK >

1. Create File Setup



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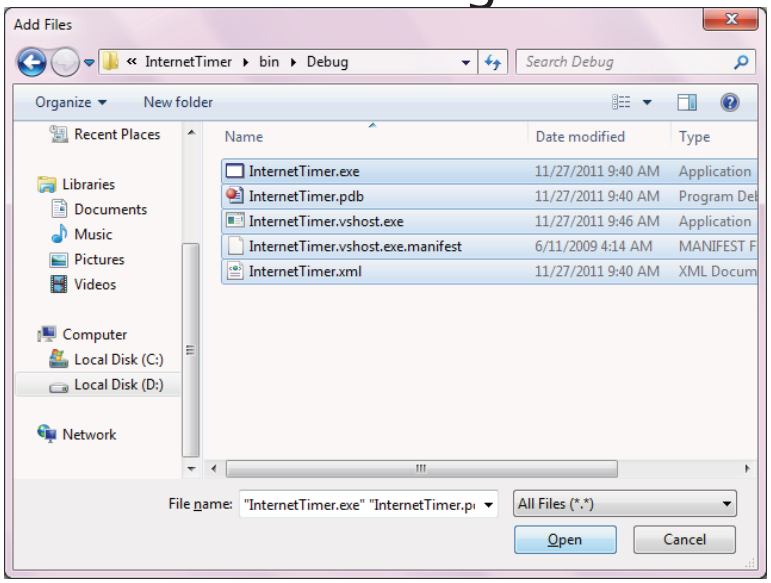
1. Create File Setup

5. Click Next > Next > Add >
6. Select all component file in Debug Folder >
7. Open >
8. Next >
9. Finish



2. Create Desktop Icon

1. Select User‟s Desktop on left side >
2. On right side please right click choose Create New Shortcut >
3. Open Application Folder >
4. Select InternetTimer.exe >
5. Click OK Button >

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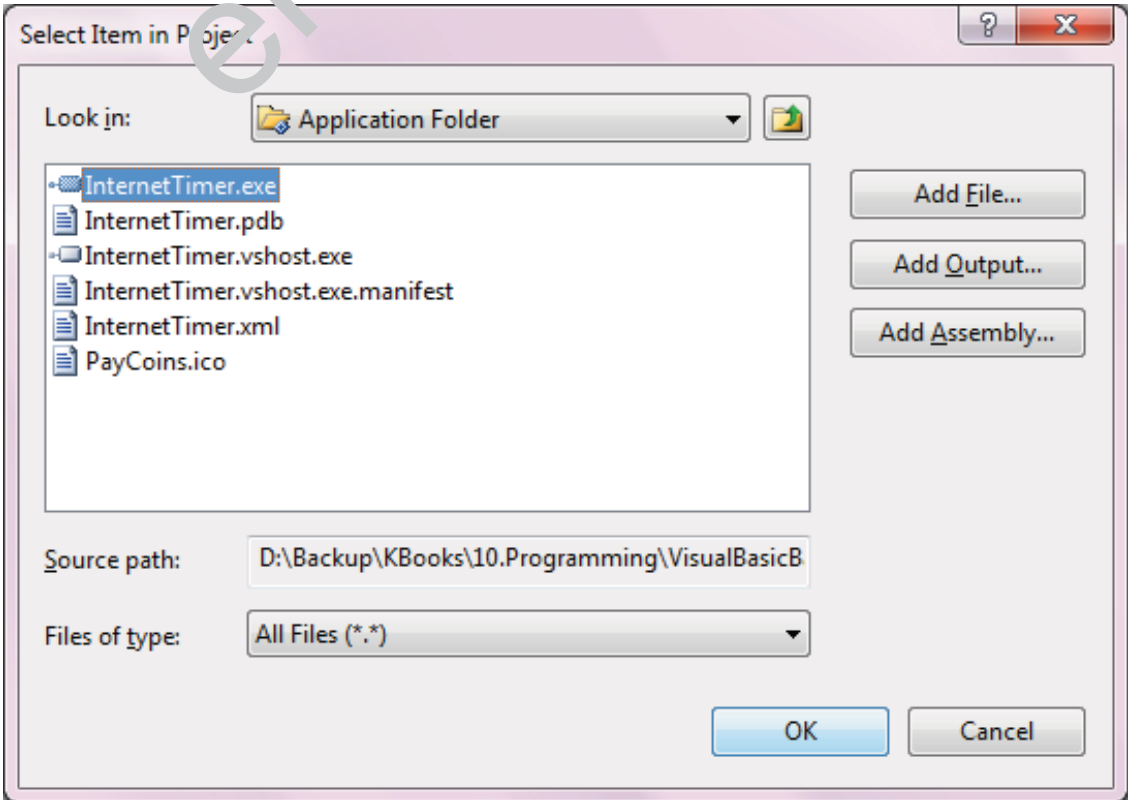
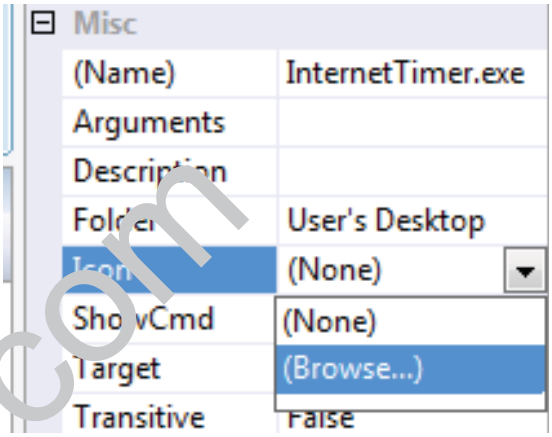
2. Create Desktop Icon



2. Create Desktop Icon

6. Rename the shortcut to InternetTimer >
7. In the Icon property click Browse >
8. Click Browse Button >



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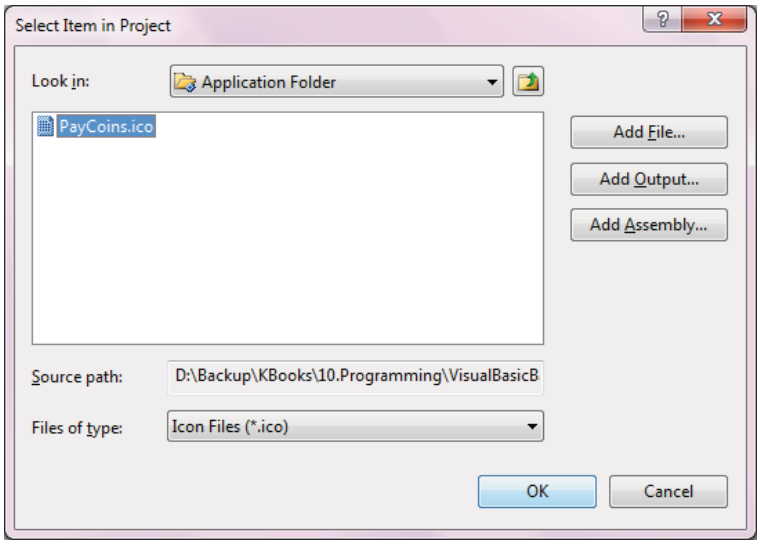
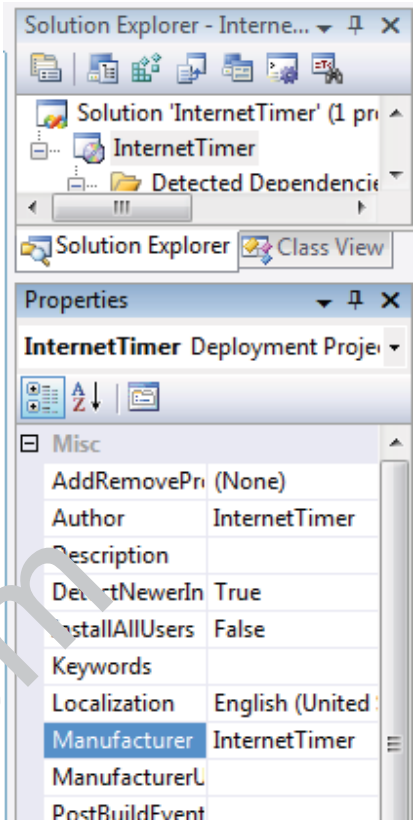
2. Create Desktop Icon

9. Open Application Folder >
10. Select the icon file >
11. OK >
12. OK Again



3. Changing Author Info

1. In Solution Explorer
Select on Internet Timer >
2. In Author and Manufacturer
Property change to
InternetTimer >
3. Right Click on InternetTimer
And choose build



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