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4.	Programming exercise on conversion of data types in VB.Net.
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6.	Write a program to read names of three students and display it on the screen.
7.	Write a Program using PI as constant value and calculate area of circle.
8.	Write a program to display the first 10 natural numbers and calculate their Sum and
	Average Value.
9.	Write a program using enumerated data type and assigning days of week from 1 to 7
	and display their values.
10.	Write a program to find the percentage of students using obtained and total marks.
	Check whether a student is Pass/Fail using 40 as passing criteria.
11.	Write a program to input two strings and perform various string operations like
12.	Concat, ToLower, ToUpper, Trim, Compare, Contains, Substring etc.
12.	Write a program to read a single dimensional array of 20 numbers. Find & Display the smallest and largest of those numbers.
13.	Write a programs using conditional statements and loops:
	Generate Fibonacci series.
14.	Read two matrices of 2 x 20 , add these matrices and display the resulting matrix.
15.	Write a program using a function to reverse a number.
16.	Write a sub procedure to display the biggest of three numbers passed as parameters.
17.	Write a program to declare a class of 'Box' having data members as height, length and
	breadth. Find and display the volume of Box using member functions of the class.
18.	Write a program to create a form by using tool box controls.
19.	Write a program for handling various mouse events such as MouseHover,
	MouseDown etc.
20.	Write a program for File Handling in VB.Net
21.	Write a program to design a simple calculator .
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Experiment 1. Installing of VB.NET

To use Visual Studio 2015, you must have installed the following —

- Microsoft Visual Studio 2015 Update 3
- Microsoft .NET Core 1.0.1 VS 2015 Tooling Preview 2

Microsoft provides a free version of visual studio which also contains the SQL Server and can be downloaded from

https://www.visualstudio.com/en-us/downloads/download-visual-studio-vs.aspx

and Microsoft .NET Core 1.0.1 - VS 2015 Tooling Preview 2 can be downloaded from

https://www.visualstudio.com/downloads/

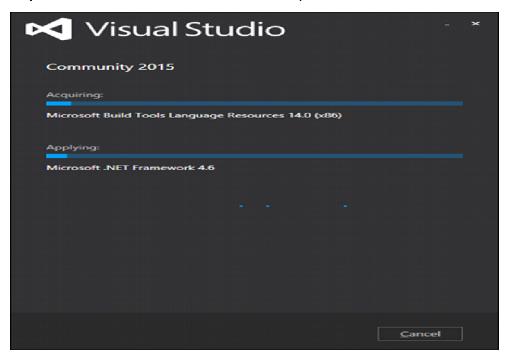
Installation of Visual Studio 2015

Follow these steps to install Visual Studio 2015 -

Step 1 — Once the downloading completes, then run the installer. The following dialog box will be displayed.



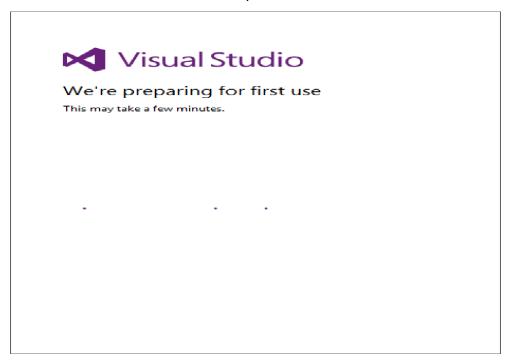
Step 2 — Click **Install** to start the installation process.



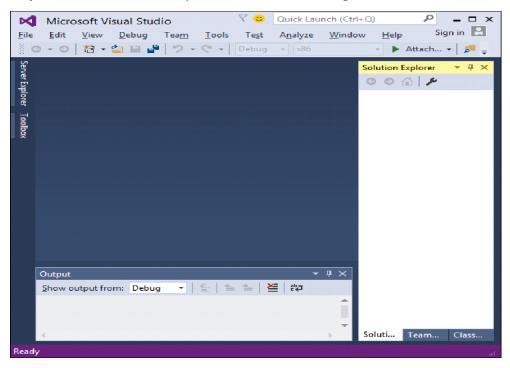
Step 3 — Once the installation completes, you will see the following dialog box.



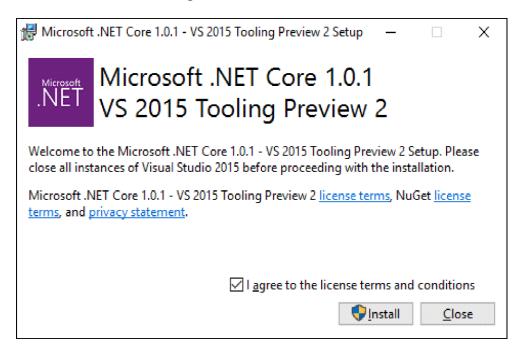
- **Step 4** Close this dialog and restart your computer if required.
- **Step 5** Open Visual Studio from the Start Menu; you will receive the following dialog box. It may take a few minutes to load and finally be used for the first time.



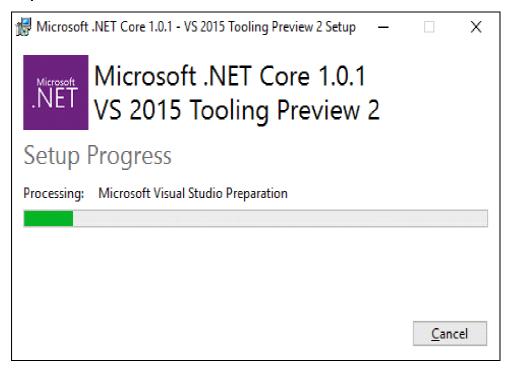
Step 6 — Once it is loaded, you will see the following screen.



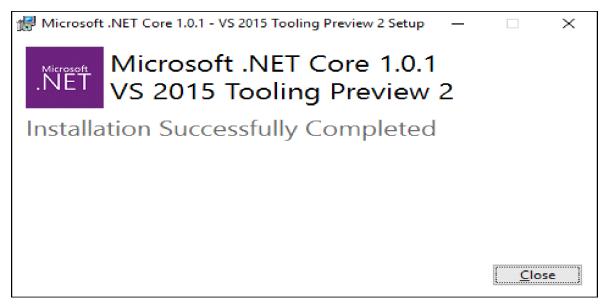
Step 7 — Once Visual Studio installation is finished, then close Visual Studio and launch Microsoft .NET Core - VS 2015 Tooling Preview 2.



Step 8 — Check the checkbox and click Install.



Step 9 — Once the installation completes, you will see the following dialog box.



You are now ready to start your application using .NET Core.

Experiment 2. Study **overview** of VB.Net and **features** of VB.Net.

Visual Basic .NET (VB.NET) is an object-oriented computer programming language implemented on the .NET Framework. Everything in VB.NET is an object, including all of the primitive types (Short, Integer, Long, String, Boolean, etc.) and user-defined types, events, and even assemblies. All objects inherit from the base class Object.

Features VB.Net

- Boolean Conditions
- Automatic Garbage Collection
- Standard Library
- Assembly Versioning
- Properties and Events
- Delegates and Events Management
- Easy-to-use Generics
- Indexers
- Conditional Compilation
- Simple Multithreading

Experiment 3. Programming exercise on using various data types of VB.Net.

Data Type	Storage Allocation	Value Range
Boolean	Depends on implementing platform	True or False
Byte	1 byte	0 through 255 (unsigned)
Char	2 bytes	0 through 65535 (unsigned)
Date	8 bytes	0:00:00 (midnight) on January 1, 0001 through 11:59:59 PM on December 31, 9999
Decimal	16 bytes	0 through +/- 79,228,162,514,264,337,593,543,950,33 5 (+/-7.9E+28) with no decimal point; 0 through +/- 7.9228162514264337593543950335 with 28 places to the right of the decimal
Double	Double	1.79769313486231570E+308 through - 4.94065645841246544E-324, for negative values
		4.94065645841246544E-324 through 1.79769313486231570E+308, for positive values
Integer	4 bytes	-2,147,483,648 through 2,147,483,647 (signed)
Long	8 bytes	-9,223,372,036,854,775,808 through 9,223,372,036,854,775,807(signed)
Object	4 bytes on 32-bit platform	Any type can be stored in a variable of type Object
	8 bytes on 64-bit platform	

SByte	1 byte	-128 through 127 (signed)
Short	2 bytes	-32,768 through 32,767 (signed)
Single	4 bytes	-3.4028235E+38 through -1.401298E-45 for negative values; 1.401298E-45 through 3.4028235E+38 for positive values
String	Depends on implementing platform	0 to approximately 2 billion Unicode characters
UInteger	4 bytes	0 through 4,294,967,295 (unsigned)
ULong	8 bytes	0 through 18,446,744,073,709,551,615 (unsigned)
User-Defined	Depends on implementing platform	Each member of the structure has a range determined by its data type and independent of the ranges of the other members
UShort	2 bytes	0 through 65,535 (unsigned)

Imports System

Module DataTypes

Sub Main()

Dim b As Byte

Dim n As Integer

Dim si As Single

Dim d As Double

Dim da As Date

Dim c As Char

Dim s As String

Dim bl As Boolean

```
b = 1
    n = 1234567
    si = 0.12345678901234566
    d = 0.12345678901234566
    da = Today
    c = "U"c
    s = "Me"
    Console.Write(c & " and," & s & vbCrLf)
      Console.WriteLine("declaring on the day of: {0}", da)
      Console.WriteLine("We will learn VB.Net seriously")
      Console.WriteLine("Lets see what happens to the floating point
variables:")
      Console.WriteLine("The Single: {0}, The Double: {1}", si, d)
    Console.ReadKey()
  End Sub
End Module
```

Experiment 4. Programming exercise on **conversion of data types** in VB.Net.

```
Imports System

Module DataTypes
Sub Main()
Dim n As Integer
Dim da As Date
Dim bl As Boolean = True
n = 1234567
da = Today

Console.WriteLine(bl)
Console.WriteLine(CSByte(bl))
Console.WriteLine(CStr(bl))
Console.WriteLine(CStr(da))
Console.WriteLine(CChar(CChar(CStr(n))))
```

```
Console.WriteLine(CChar(CStr(da)))
Console.ReadKey()
End Sub
End Module
```

Experiment 5. Write a program in VB.Net to **Add, Subtract** and **Multiply** two numbers.

```
Module Module1
  Sub Main()
   Dim a As Integer
   Dim b As Integer
    a = 10
    b = 5
    'Sum of a And be
   Console.WriteLine("Sum of two numbers: " & (a + b))
    'Submission of two number
   Console.WriteLine("Submission of two numbers: " & (a -
    b))
    'Multiplication of two number
   Console.WriteLine("Mul of two numbers: " & (a * b))
    Console.ReadLine()
  End Sub
End Module
```

Experiment 6. Write a program to read names of three students and display it on the screen.

Module Module1

```
Sub Main()

'Create a list of students.

Dim students = GetStudents()

'Display the names in the list.

DisplayList(students)

Console.ReadLine()

End Sub
```

```
'Call DisplayList to see the names of the students in the list.
Sub DisplayList(ByVal studentCol As IEnumerable(Of Student))
  For Each st As Student In studentCol
    Console.WriteLine("First Name: " & st.First)
    Console.WriteLine("Last Name: "& st.Last)
    Console.WriteLine()
  Next
End Sub
'Function GetStudents returns a list of Student objects.
Function GetStudents() As IEnumerable(Of Student)
  Return New List(Of Student) From
    {
    New Student("Ram", "Kumar", "Primary", 10),
    New Student("Amit", "Kumar", "HS", 2),
    New Student("Deepak", "Kumar", "UG", 7)
End Function
'Each student has a first name, a last name, a class year, and
'a rank that indicates academic ranking in the student body.
Public Class Student
  Public Property First As String
  Public Property Last As String
  Public Property Year As String
  Public Property Rank As Integer
  Public Sub New()
  End Sub
  Public Sub New(ByVal firstName As String,
          ByVal lastName As String,
          ByVal studentYear As String,
          ByVal studentRank As Integer)
    First = firstName
    Last = lastName
```

```
Year = studentYear
Rank = studentRank
End Sub
End Class
End Module
```

Experiment 7. Write a Program using **PI as constant value** and **calculate area of circle**.

```
Module Module1
Public Sub Main(args() As String)
Dim r As Integer = 22
Dim a As Double
Const PI = 3.14
a = PI * r * r
Console.WriteLine("Area of circle " & (a))
End Sub
End Module
```

Experiment 8. Write a program to display the first 10 natural numbers and calculate their **Sum** and **Average** Value.

```
Imports System

Module Program
Sub Main(args As String())
Dim number As Integer = 11
Dim sum As Integer = 0
For i As Integer = 1 To number
    sum += i
Next
Dim Avg As Integer
Avg = sum / number
Console.WriteLine("Sum Of natural number" & Avg)
Console.WriteLine("Sum Of natural number" & sum)
```

End Sub End Module

Experiment 9. Write a program using **enumerated data type** and assigning days of week from 1 to 7 and display their values. Days of week from 1 to 7 and display their values.

```
Imports System
Module Enum_Day
 Enum Weekday 'Enumeration name
    Monday = 1
   Tuesday = 2
   Wedneday = 3
   Thursday = 4
   Friday = 5
   Saturday = 6
   Sunday = 7
  End Enum
  Sub Main()
    Dim x As Integer = CInt(Weekday.Monday)
   Dim y As Integer = CInt(Weekday.Tuesday)
   Dim p As Integer = CInt(Weekday.Wedneday)
   'Console.WriteLine("Week Days name is {0}", Weekday.Monday)
   Console.WriteLine("Value is "& Weekday.Monday)
   Console.ReadKey()
End Sub
End Module
```

Experiment 10. Write a program to find the **percentage** of students using obtained and total marks. Check whether a student is **Pass/Fail** using 40 as passing criteria.

```
Imports System

Module Module1

Sub Main()
```

```
Dim m1, m2, m3, m4, m5, total As Integer
    Dim name As String
    Dim avg As Double
    Console.WriteLine("Enter the name:")
    name = Console.ReadLine()
    Console.WriteLine("Enter the Marks:")
    m1 = Console.ReadLine()
    m2 = Console.ReadLine()
    m3 = Console.ReadLine()
    m4 = Console.ReadLine()
    m5 = Console.ReadLine()
    total = m1 + m2 + m3 + m4 + m5
    avg = total / 5
   Console.WriteLine("Total Marks=" & total)
    Console.WriteLine("Average=" & avg)
    'divide avg by 10 to make the calculation easier
    avg = avg / 10
    If (avg >= 4) Then
      Console.WriteLine("Pass")
    Else
      Console.WriteLine("Fail")
    End If
    Console.ReadKey()
  End Sub
End Module
```

Experiment 11. Write a program to input two strings and perform various string operations like Concat, ToLower, ToUpper, Trim, Compare, Contains, Substring etc.

```
Imports System

Module strings
Sub Main()
Dim fname, Iname, fullname, greetings As String
fname = "Saurav Kumar"
```

```
Iname = "Pandey"
    fullname = fname + " " + Iname
    Console.WriteLine("Full Name: {0}", fullname)
    'By using string constructor
    Dim letters As Char() = {"H", "e", "I", "I", "o"}
    greetings = New String(letters)
    Console.WriteLine("Greetings: {0}", greetings)
    'Methods returning String
    Dim array() As String = {"Hello", "From", "Ambedkar", "DSEU",
"Shakarpur", "Campus-I"}
    Dim message As String = String.Join(" ", sarray)
    Console.WriteLine("Message: {0}", message)
    'Method Compare String
    Dim str1, str2 As String
    str1 = "This is text"
    str2 = "This is text"
    If (String.Compare(str1, str2) = 0) Then
      Console.WriteLine(str1 + " and " + str2 + " are equal.")
      Console.WriteLine(str1 + " and " + str2 + " are not equal.")
    End If
    'Method to Find a given word in String
    Dim str3 As String
    str3 = "This is test"
    If (str3.Contains("test")) Then
      Console.WriteLine("The sequence 'test' was found.")
    End If
    'Method to Concat String
    Dim str As String
    str = " Last night I was in theatre
```

```
Console.WriteLine(str)
    Dim substr As String = str.Substring(23)
    Console.WriteLine(substr)
    'Method toLower
    Dim lower As String = str.ToLower()
    Console.WriteLine(lower)
    'Method ToUpper
    Dim upper As String = str.ToUpper()
    Console.WriteLine(upper)
    'Method Concat
    Dim result As String = String.Concat(str1, str2)
    Console.WriteLine(result)
    'Method Trim
    Dim result1 As String = str.Trim()
    Console.WriteLine(result1)
  End Sub
End Module
```

Experiment 12. Write a program to read a single **dimensional array** of 20 numbers. Find & Display the **smallest and largest** of those numbers.

```
Imports System
Module IterateArray
   Public Sub Main()
      Dim numbers = {10, 20, 30, 40, 4, 5, 6, 7, 8, 9, 2, 43, 5, 6, 75, 5, 65, 45, 66, 5}
      Dim max = numbers(0)
      Dim min = numbers(0)
      Console.WriteLine(max)
      For index = 0 To numbers.GetUpperBound(0)
            If numbers(index) > max Then
```

```
max = numbers(index)

End If

If numbers(index) < min Then

min = numbers(index)

End If

Console.Write(" " & numbers(index))

Next

Console.WriteLine(" " & max)

Console.WriteLine(" " & min)

End Sub

End Module
```

Experiment 13. Write a program using conditional statements and loops: **A.) Generate Fibonacci series**.

```
Imports System
Module Module1
 Sub Main ()
    Dim a, b, c, n, i As Integer
    Console.Write ("Enter how many elements :-")
    n = Val (Console.ReadLine())
    a = 0
    b = 1
    Console.Write(" " & a)
    Console.Write(" " & b)
    i = 1
    While (i < n - 1)
      c = a + b
      Console.Write(" " & c)
      a = b
      b = c
      i = i + 1
    End While
    Console.ReadLine()
 End Sub
End Module
```

Experiment 14. Read **two matrices of 2 x 2**, **add** these matrices and display the resulting matrix.

```
Imports System
Module Module1
Sub Main ()
    Dim matrix1(,) As Integer = New Integer(2, 2) {}
    Dim matrix2(,) As Integer = New Integer(2, 2) {}
    Dim matrix3(,) As Integer = New Integer(2, 2) {}
    Console.WriteLine("Enter Matrix1: ")
    For i = 0 To 1 Step 1
      For j = 0 To 1 Step 1
         Console.Write("Enter element[{0}][{1}]: ", i, j)
         matrix1(i, j) = Integer.Parse(Console.ReadLine())
      Next
    Next
    Console.WriteLine("Enter Matrix2: ")
    For i = 0 To 1 Step 1
      For j = 0 To 1 Step 1
         Console.Write("Enter element[{0}][{1}]: ", i, j)
         matrix2(i, j) = Integer.Parse(Console.ReadLine())
      Next
    Next
       'Add Matrix1 and Matrix2
    For i = 0 To 1 Step 1
      For j = 0 To 1 Step 1
         matrix3(i, j) = matrix1(i, j) + matrix2(i, j)
      Next
    Next
    Console.WriteLine("Matrix1: ")
    For i = 0 To 1 Step 1
      For j = 0 To 1 Step 1
         Console.Write("{0} ", matrix1(i, j))
      Next
```

```
Console.WriteLine()
    Next
    Console.WriteLine("Matrix2: ")
    For i = 0 To 1 Step 1
      For j = 0 To 1 Step 1
        Console.Write("{0} ", matrix2(i, j))
      Next
      Console.WriteLine()
    Next
    Console.WriteLine("Addition of Matrix1 and Matrix2: ")
    For i = 0 To 1 Step 1
      For j = 0 To 1 Step 1
        Console.Write("{0} ", matrix3(i, j))
      Next
      Console.WriteLine()
    Next
  End Sub
End Module
```

Experiment 15. Write a program using a function to **reverse a number**.

Module Module1

```
Sub Main()
Dim number As Integer = 0
Dim remainder As Integer = 0
Dim reverse As Integer = 0

Console.Write("Enter the number: ")
number = Integer.Parse(Console.ReadLine())

While (number > 0)
'Console.WriteLine (" number before mod" & number)
remainder = number Mod 10
Console.WriteLine(" number after mod" & number)
Console.WriteLine(" remainder" & remainder)
```

```
reverse = reverse * 10 + remainder
Console.WriteLine(" reverse" & reverse)
number = number / 10
End While

Console.WriteLine("Reverse: {0}", reverse)
End Sub
End Module
```

Experiment 16. Write a sub procedure to **display the biggest of three numbers** passed as parameters.

```
Imports System
Module paramByval
  Dim large As Integer
  Sub largest(ByVal x As Integer, ByVal y As Integer, ByVal z As Integer)
    If x > y Then
    Elself x > z Then
      large = x
    Elself z > y Then
      large = z
    Else
      large = y
    End If
  End Sub
  Sub Main ()
    'Local variable definition
    Dim a As Integer = 100
    Dim b As Integer = 200
    Dim c As Integer = 300
    Console.WriteLine("Before operation, value of a: {0}", a)
    Console.WriteLine("Before operation, value of b: {0}", b)
    Console.WriteLine("Before operation, value of a : {0}", c)
```

```
'Calling a function to find the large number'
largest (a, b, c)
Console.WriteLine("After operation, value of a : {0}", a)
Console.WriteLine("After operation, value of b : {0}", b)
Console.WriteLine("After operation, value of b : {0}", c)
Console.WriteLine(large)
Console.ReadLine()
End Sub
End Module
```

Experiment 17. Write a program to declare a class of 'Box' having data members as height, length and breadth. Find and display the volume of **Box** using member functions of the class.

```
Imports System
Module mybox
  Class Box
    Public length As Double 'Length of a box
    Public breadth As Double 'Breadth of a box
    Public height As Double 'Height of a box
   Public Sub setLength(ByVal len As Double)
      length = len
    End Sub
    Public Sub setBreadth(ByVal bre As Double)
      breadth = bre
    End Sub
    Public Sub setHeight(ByVal hei As Double)
      height = hei
    End Sub
    Public Function getVolume() As Double
      Return length * breadth * height
    End Function
  End Class
  Sub Main()
    Dim Box1 As Box = New Box()
                                    ' Declare Box1 of type Box
    Dim volume As Double = 0.0 Store the volume of a box here
```

```
' box 1 specification
Box1.setLength(12.0)
Box1.setBreadth(7)
Box1.setHeight(9.0)

' volume of box 1
volume = Box1.getVolume()
Console.WriteLine("Volume of Box1 : {0}", volume)

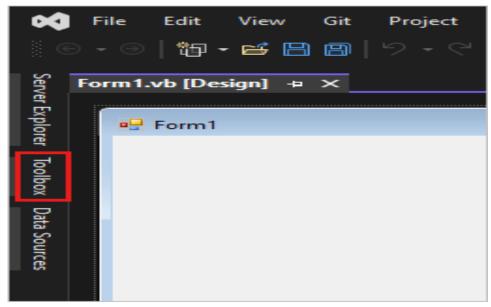
Console.ReadKey()
End Sub
End Module
```

Experiment 18. Write a program to **create a form** by using tool box controls.

Add a button to the form

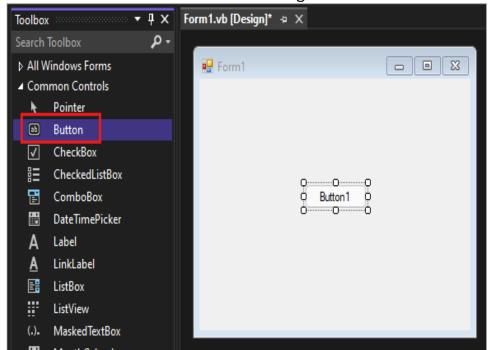
After you select your Visual Basic project template and name your file, Visual Studio opens a form for you. A form is a Windows user interface. You'll create a "Hello World" application by adding controls to the form.

1. On the left side of the Visual Studio IDE, select the Toolbox tab. If you don't see it, select View > Toolbox from the menu bar or Ctrl+Alt+X.

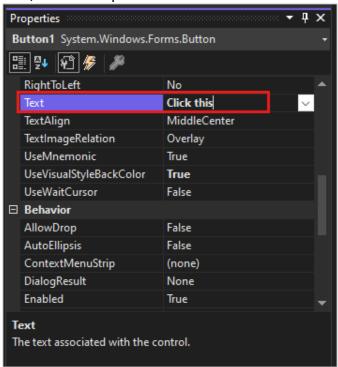


If you want, select the Pin icon to dock the Toolbox window.

2. Select the Button control and then drag it onto the form.

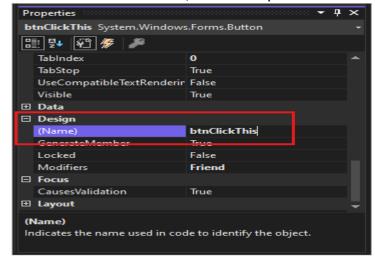


3. In the Appearance section of the Properties window, for Text, type *Click this*, and then press Enter.



If you don't see the Properties window, you can open it from the menu bar. Select View > Properties Window or press F4.

4. In the Design section of the Properties window, change the name from Button1 to *btnClickThis*, and then press Enter.



Note

if you've alphabetized the list in the Properties window, Button1 appears in the (Data Bindings) section, instead.

Add a label and code

Now that you've added a button control to create an action, add a label control to send text to.

- 1. Select the Label control in the Toolbox window, and then drag it onto the form. Place it beneath the Click this button.
- 2. In either the Design section or the (DataBindings) section of the Properties window, change the name Label1 to *lblHelloWorld*, and then press Enter.
- In the Form1.vb [Design] window, double-click the Click this button to open the Form1.vb window.
 Another option is to expand Form1.vb in Solution Explorer, and then select Form1.
- 4. In the Form1.vb window, between the Private Sub and End Sub lines, enter *lblHelloWorld.Text* = "Hello World!" as shown in the following screenshot:

Experiment 19. Write a program for handling various mouse events such as **MouseHover**, **MouseDown** etc.

- a. Add three labels, three text boxes and a button control in the form.
- b. Change the text properties of the labels to Customer ID, Name and Address, respectively.
- c. Change the name properties of the text boxes to txtID, txtName and txtAddress, respectively.
- d. Change the text property of the button to 'Submit'.
- e. Add the following code in the code editor window -

```
Public Class Form1
 Private Sub Form1 Load(sender As Object, e As EventArgs) Handles
MyBase.Load
   'Set the caption bar text of the form.
   Me.Text = "Hello"
 End Sub
 Private Sub txtID MouseEnter(sender As Object, e As EventArgs)
   Handles txtID.MouseEnter
   'Code for handling mouse enter on ID textbox
   txtID.BackColor = Color.CornflowerBlue
  txtID.ForeColor = Color.White
 End Sub
 Private Sub txtID MouseLeave(sender As Object, e As EventArgs)
   Handles txtID.MouseLeave
   'Code for handling mouse leave on ID textbox
   txtID.BackColor = Color.White
   txtID.ForeColor = Color.Blue
 End Sub
```

```
Private Sub txtName_MouseEnter(sender As Object, e As EventArgs) _
   Handles txtName.MouseEnter
   'Code for handling mouse enter on Name textbox
   txtName.BackColor = Color.CornflowerBlue
  txtName.ForeColor = Color.White
 End Sub
 Private Sub txtName_MouseLeave(sender As Object, e As EventArgs) _
   Handles txtName.MouseLeave
   'Code for handling mouse leave on Name textbox
   txtName.BackColor = Color.White
   txtName.ForeColor = Color.Blue
 End Sub
 Private Sub txtAddress MouseEnter(sender As Object, e As EventArgs)
   Handles txtAddress.MouseEnter
   'Code for handling mouse enter on Address textbox
  txtAddress.BackColor = Color.CornflowerBlue
   txtAddress.ForeColor = Color.White
 End Sub
 Private Sub txtAddress MouseLeave(sender As Object, e As EventArgs)
   Handles txtAddress.MouseLeave
   'Code for handling mouse leave on Address textbox
   txtAddress.BackColor = Color.White
  txtAddress.ForeColor = Color.Blue
 End Sub
 Private Sub Button1_Click(sender As Object, e As EventArgs) _
   Handles Button1.Click
  MsgBox("Thank you " & txtName.Text & ", for your kind cooperation")
 End Sub
End Class
```

Experiment 20. Write a program for **File Handling** in VB.Net

First make a text file with name Myfile

```
Imports System.IO
Module StReader
Sub Main()

Dim St As StreamReader = New StreamReader("C:\Users\Graphics Lab
1\Desktop\Myfile.txt")
Dim In As String

In = St.ReadLine()
While (In <> Nothing)
Console.WriteLine(In)
In = St.ReadLine()
End While
St.Close()
Console.ReadKey()
End Sub
End Module
```