

IST 256
Lab Week 4, Part 1 – February 2, 2009

1. Understanding Loops – showing the variables of a program

For this problem, you are not to put any part of the program into Visual Studio. You are to write your answers on this lab sheet. (Think of this as a practice exam question.)

A. Consider the following program for a button:

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
    Dim counter, sum As Integer
    counter = 0
    sum = 0

    ' add integers from 1 to 10
    For counter = 1 To 10 Step 1
        sum = sum + counter
    Next

    ' show the number to the user
    Label1.Text = CStr(sum)
End Sub
```

In the following boxes, write the values of the variables as this program is executed:

Variable	Val1	Val2	Val3	Val4	Val5	Val6	Val7	Val8	Val9	Val10	Val11
counter											
sum											

What number will be shown to the user? (write it here):

B. Consider the following program for a button:

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button1.Click
    Dim counter, sum, square As Integer
    counter = 0
    square = 0
    sum = 0

    ' add the squares of integers from 1 to 6
    For counter = 1 To 6 Step 1
        square = counter * counter
        sum = sum + square
    Next

    ' show the number to the user
    Label1.Text = CStr(sum)
End Sub
```

In the following boxes, write the values of the variables as this program is executed:

Variable	Val1	Val2	Val3	Val4	Val5	Val6	Val7
counter							
square							
sum							

What number will be shown to the user? (write it here):

2. Compute Interest – extending the compute interest program

For this application, you should open Visual Studio and create a new project named something like ComputeInterest. This new project should be in the same lab projects folder as usual.

In the **initial form**, change the name and text properties of the form for the new ComputeInterest project.

In class, an application was developed for a simpler version of the ComputeInterest program. In this application, the user typed in numbers for the following:

- Initial bank balance

- Number of years to compute a new balance

- Interest rate, given as a decimal number

There were two buttons, one called Calculate, and one for Close.

When the user clicked on the Calculate button, a new bank balance was computed by computing the interest each year and adding it into the bank balance for that year.

Here is the program:

```
Public Class Form1

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button1.Click
        Dim counter, numyears As Integer
        Dim balance, interestrate, interestamount As Single

        ' Get the user balance, number of years, and interest rate
        balance = CSng(TextBox1.Text)
        numyears = CInt(TextBox2.Text)
        interestrate = CSng(TextBox3.Text)

        ' compute the interest for each year and add to balance
        For counter = 1 To numyears Step 1
            interestamount = balance * interestrate
            balance = balance + interestamount
        Next

        ' show the final balance to the user
        Label6.Text = Format(balance, "currency")

    End Sub

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

For lab today, you are to extend this Compute Interest application. In the extended version, the user can also type in an amount that he or she proposes to add to the bank balance as an investment each year.

Write this application, allowing the user to type in:

Initial bank balance

Number of years to compute a new balance

Interest rate, given as a decimal number

Annual investment

Add code to the Calculate button to also add in the investment amount each year. What type of variable should you add for the annual investment? Suppose that this variable is called investment. Then the new formula for a new bank balance every year would be:

$balance = balance + interestamount + investment$

Test your program and write one example here:

Initial bank balance typed by user	
Number of years	
Interest rate	
Annual investment	
New bank balance computed	

Hand in this lab sheet with Part 2 on Wednesday.