

IST 256
Lab Week 4, Part 2 – February 4, 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.

A. Consider the following program for a button as demonstrated in class:

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button1.Click
    ' use the penny variable to compute money as a decimal value
    Dim penny As Single
    ' number of times to double a penny and the loop index
    Dim numtimes, counter As Integer

    ' initialize to the value of a single penny
    penny = 0.01
    numtimes = CInt(TextBox1.Text)
    counter = 0

    For counter = 1 To numtimes
        penny = penny * 2
    Next

    ' Show the result
    Label2.Text = "Result: " & Format(penny, "c")
End Sub
```

In the following boxes, write the values of the variables as this program is executed. Assume that the user types in 5 in TextBox1:

Variable	Val1	Val2	Val3	Val4	Val5	Val6	Val7
numtimes							
counter							
penny							

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

B. Consider the following program for a button as demonstrated in class:

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button1.Click
    ' use the penny variable to compute money as a decimal value
    Dim penny As Single
    ' Goal amount to achieve by doubling
    Dim goal As Single
    ' number of times the penny was doubled
    Dim numtimes As Integer

    ' initialize the value of a single penny and the number
    penny = 0.01
    numtimes = 0
    ' Get the Goal amount from the user
    goal = CSng(TextBox1.Text)

    While penny < goal
        penny = penny * 2
        numtimes = numtimes + 1
    End While

    ' Show the result
    Label2.Text = "Number of times doubled: " & CStr(numtimes)
End Sub
```

In the following boxes, write the values of the variables as this program is executed, assume that the user types in 1.00:

Variable	Val1	Val2	Val3	Val4	Val5	Val6	Val7	Val8
goal								
numtimes								
penny								

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

2. Compute Savings – modifying the compute interest program

For this application, you are going to create a similar application to the one that you did in the last example, called something like ComputeSavings. Before starting this next program, open Visual Studio to the ComputeInterest project. Go to the Form1.vb tab and copy the program that you wrote for the Calculate button. Save this program in a text editor such as Notepad or Word so that you can refer to it while writing the ComputeSavings program.

Now open a new project with Visual Studio named something like **ComputeSavings**. This new project should be in the same lab projects folder as usual.

For this example, you are to write a similar application to the ComputeInterest project, except that this time the user wants to achieve a certain amount of savings and needs to compute how many years it will take to achieve their goal amount.

Write this application, allowing the user to type in:

Initial bank balance

Interest rate, given as a decimal number

Annual investment

Goal savings amount

There should be two buttons, one for Compute Number of Years and one for Close. The Compute Number of Years button should get the user inputs and use a while loop to compute new bank balances until the goal amount is achieved.

Look at the code that you saved for the ComputeInterest program.

- After the declarations of variables, set the numberyears variable to start at 0.
- Modify the For loop in that program to be a **while loop** in your new ComputeSavings program. The condition for the while loop should be to keep computing a new balance as long as the balance is less than the savings goal.
- Note that you must add a statement to the while loop to explicitly add one to the number of years variable during the loop.
- After the while loop, display the number of years to the user.

Test your program and write one example here:

Initial bank balance typed by user	
Interest rate	
Annual investment	
Savings goal	
Number of years to achieve goal	

To hand in your lab for the week, staple together the lab handouts from Monday and Wednesday, together with printouts of the two programs from the two labs.