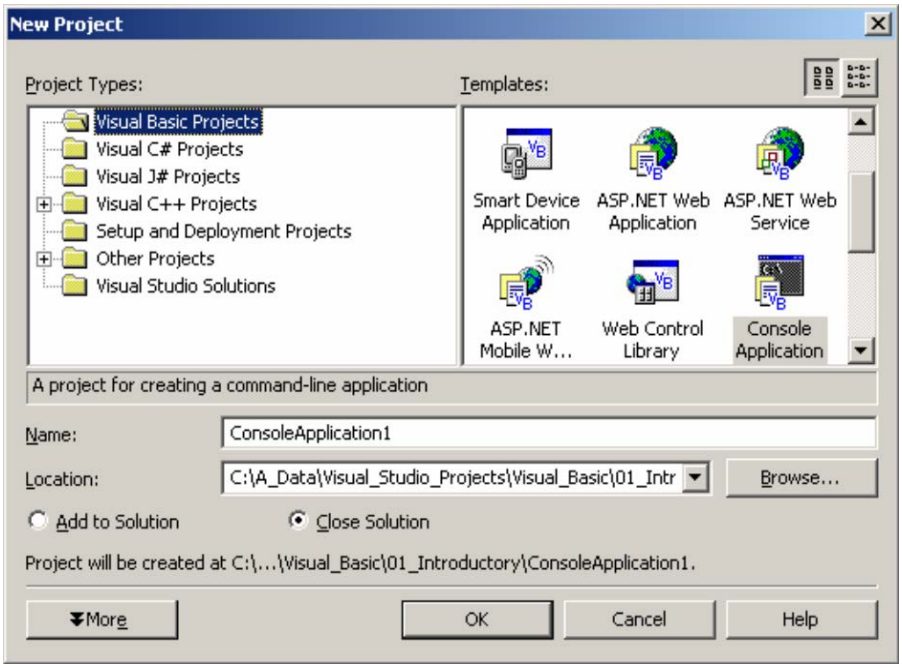
A201-A505 Laboratory Session #4 (Grade Calculator)

LAB GOALS

- To better understand the use of variables, data types and arithmetic and logical operators, conditionals and loops.
- To develop a simple Grade Calculator.

Problem Statement:
Develop a program which will ask the user to enter a student name and test score. Then the program will display the letter grade for that student.



Implementation:

Step 1: To get started, proceed to open up Microsoft Visual Basic .NET. Create a new Console Mode Project named **"GradeCalculator"**. You should see the figure below.

Step 2: Add the following two lines at the beginning of the program. (Above the "Module Module1" line:

```
Option Explicit On
Option Strict On
```

Question?
Do you remember what these two line do? If not, review your notes to find the answer before continuing with the lab.

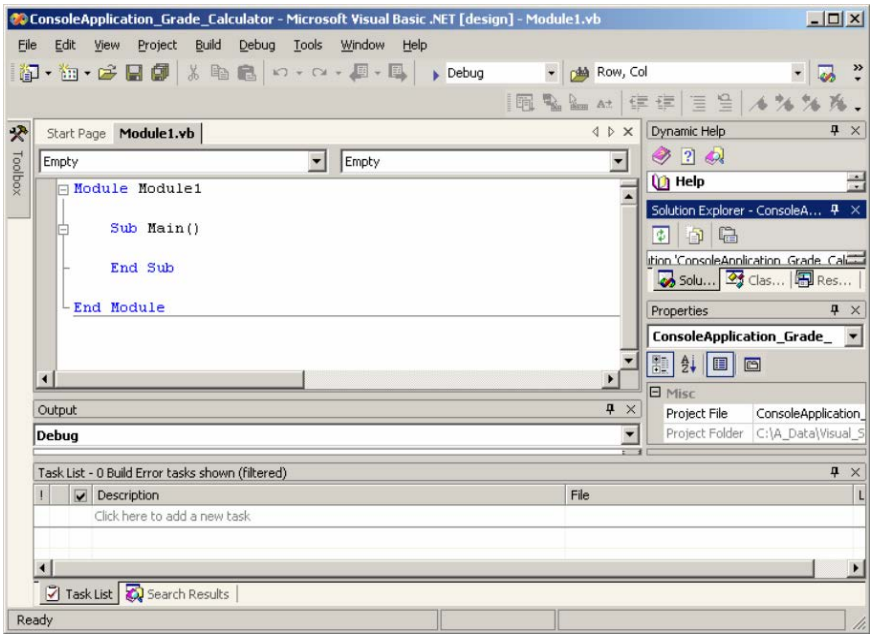
Right after the **"Sub Main()"** statement, add the following variable declarations to your program:

```
Dim TestScore As Integer
Dim StudentName As String
```

Run: Compile and Run your program. If your program does not compile, fix the syntax errors and compile the program again. Once you are able to successfully run the program, you should see that the program quickly executes and closes the Console window . In order to allow you better observe the output of the program, Right before the **"End Sub"** statement, add the following line in your program:

```
Console.ReadLine()
'Pause the program
```

Run the program again. This time, the program should run and wait for your to hit the "ENTER" key before closing the console window. Note, at this point the program is not doing much, we are compiling and running it, just to make sure there are no syntactic errors in the program.



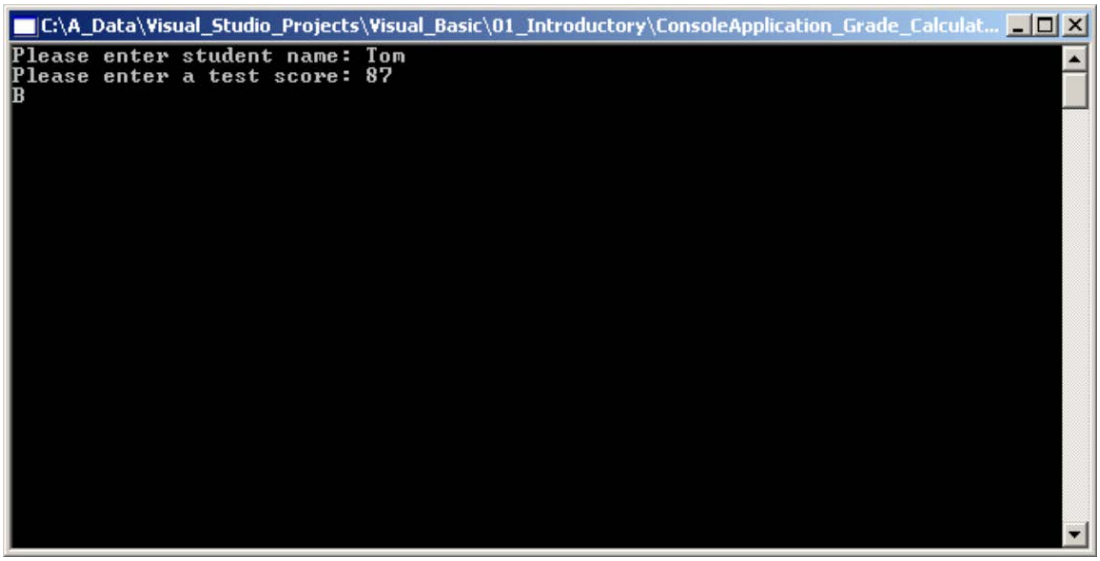
Step3: Add the following lines of code between the variable declarations and the Console.Readline() statement:

```
Console.Write("Please enter the student name: ")
StudentName = Console.ReadLine()          'Input the Name
Console.Write("Please enter a test score: ")
TestScore = Cint(Console.ReadLine())      'Input the score and convert to integer

If TestScore >= 90 Then
    Console.WriteLine("A")
ElseIf TestScore >= 80 Then
    Console.WriteLine("B")
ElseIf TestScore >= 70 Then
    Console.WriteLine("C")
ElseIf TestScore >= 60 Then
    Console.WriteLine("D")
Else
    Console.WriteLine("Failing Grade")
End If
```

Remember what Cint() does? It converts a string into an Integer!!

Run: Compile and Run your code again to see if it runs properly.



Step4: Let's make the output look a little nicer. Replace the Console.Writeline() statements which displays the letter grade with the following lines:

```
If TestScore >= 90 Then
    Console.WriteLine("Letter Grade = A")
ElseIf TestScore >= 80 Then
    Console.WriteLine("Letter Grade = B")
ElseIf TestScore >= 70 Then
    Console.WriteLine("Letter Grade = C")
ElseIf TestScore >= 60 Then
    Console.WriteLine("Letter Grade = D")
Else
    Console.WriteLine("Failing Grade")
End If
```

Run: Run your program again to see if it runs properly.

Question? Can you think of another way to achieve the same result as achieved in Step 4?

Step5: Refinement. Note if the user have more than one student, he/she must run the program multiple times. Can we modify the above program so that it will first ask the user to enter the number of students, then it will loop through that many times?

Let's try a **WHILE** loop:

Add the following 3 lines right after the declarations:

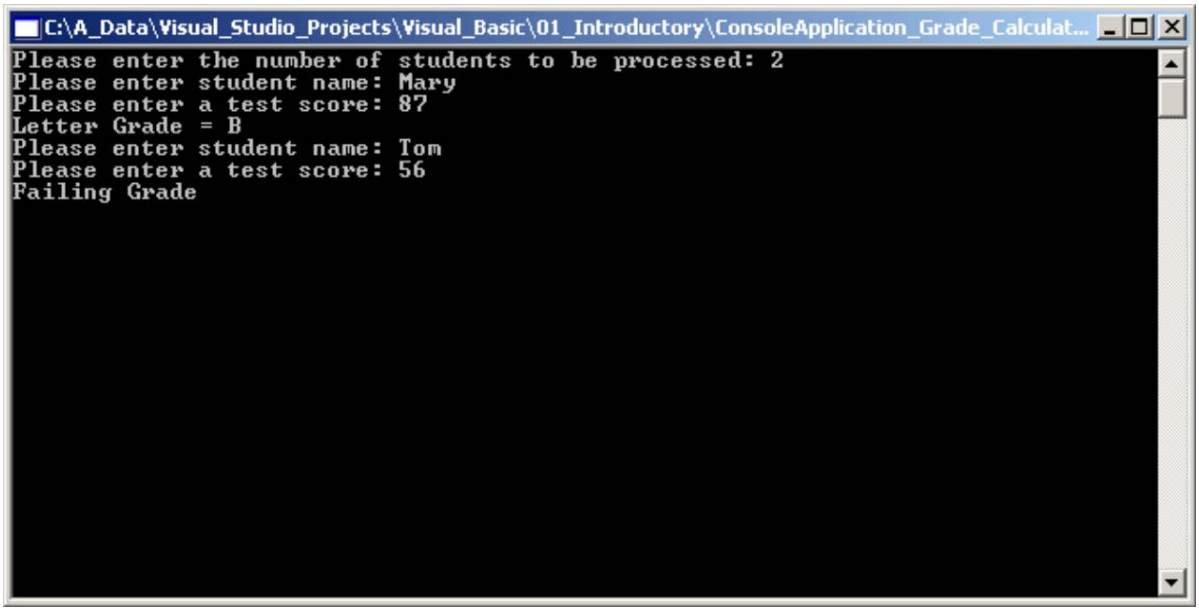
```
Dim NumberOfStudents As Integer
Console.Write("Please enter the number of students to be processed: ")
NumberOfStudents = CInt(Console.ReadLine())  'Input the number of students
```

Add a while loop to process one or more students:

```
While (NumberOfStudents >= 1)
    Console.Write("Please enter student name: ")
    StudentName = Console.ReadLine()         'Input the Name
    Console.Write("Please enter a test score: ")
    TestScore = CInt(Console.ReadLine())     'Input score, convert to integer

    If TestScore >= 90 Then
        Console.WriteLine("Letter Grade = A")
    ElseIf TestScore >= 80 Then
        Console.WriteLine("Letter Grade = B")
    ElseIf TestScore >= 70 Then
        Console.WriteLine("Letter Grade = C")
    ElseIf TestScore >= 60 Then
        Console.WriteLine("Letter Grade = D")
    Else
        Console.WriteLine("Failing Grade")
    End If

    NumberOfStudents = NumberOfStudents - 1 ' subtract from the number of students
End While
```



```
'-------------------------------------------------------
' Lab 3.2 (A201/A505)
' Grade Calculator
'
' This program will ask the user to enter some test scores and
' it will calculate the equivalent letter grade.

Option Strict On
Option Explicit On


Module Module1

    Sub Main()
        Dim TestScore As Integer
        Dim StudentName As String

        Dim NumberOfStudents As Integer
        Console.Write("Please enter the number of students to be processed: ")
        NumberOfStudents = CInt(Console.ReadLine())  'Input the number of students

        While (NumberOfStudents >= 1)
            Console.Write("Please enter student name: ")
            StudentName = Console.ReadLine()         'Input the Name
            Console.Write("Please enter a test score: ")
            TestScore = CInt(Console.ReadLine())     'Input score, convert to integer

            If TestScore >= 90 Then
                Console.WriteLine("Letter Grade = A")
            ElseIf TestScore >= 80 Then
                Console.WriteLine("Letter Grade = B")
            ElseIf TestScore >= 70 Then
                Console.WriteLine("Letter Grade = C")
            ElseIf TestScore >= 60 Then
                Console.WriteLine("Letter Grade = D")
            Else
                Console.WriteLine("Failing Grade")
            End If

            NumberOfStudents = NumberOfStudents - 1 ' subtract from the number of students
        End While


        Console.ReadLine()                'Pause the program

    End Sub

End Module
```