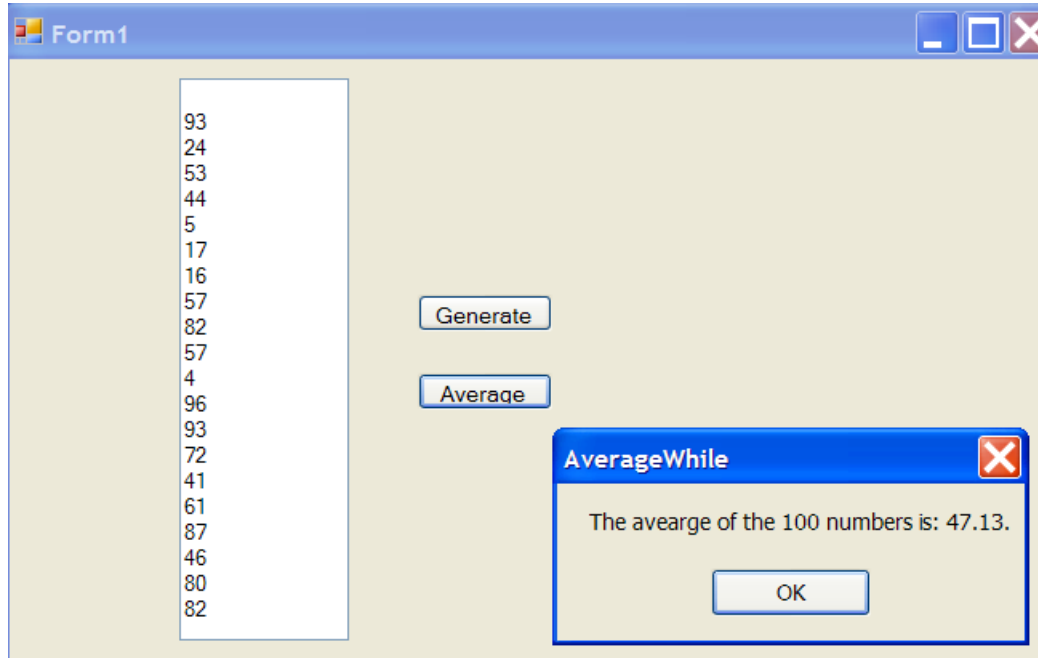# Finding Averages

Write a program that generates and tallies the sum of 100 random numbers between 1 and 100.

Display the average of these numbers. How close to 50 is this average? Does increasing the number of random numbers bring this average close to 50?

You will require variables to hold the random number that is generated with each loop, the tally of the random numbers, the number of numbers being generated and the average.

# The GUI

# The Code

```
Public Class Form1
    Dim number As Integer
    Dim tally As Integer = 0
    Dim average As Double
    Dim counter As Integer = 0
    Dim wrap As String = Chr(13) & Chr(10)
    Private Sub btnGenerate_Click(ByVal sender As System.Object, ByVal e As System
        Randomize()
        While (counter < 100)
            number = Int(1 + (Rnd() * 100) + 1)
            tally = tally + number
            counter = counter + 1
            txtRandom.Text = txtRandom.Text & wrap & number
        End While
    End Sub

    Private Sub btnAverage_Click(ByVal sender As System.Object, ByVal e As System
        average = tally / counter
        MsgBox("The avearge of the " & counter & " numbers is: " & average & ".")
    End Sub
End Class
```

**Generate a random number with each loop.**

**Tally up each new random number to the sum of the previous numbers.**

**Concatenate the new number with the other numbers, each on their own line.**
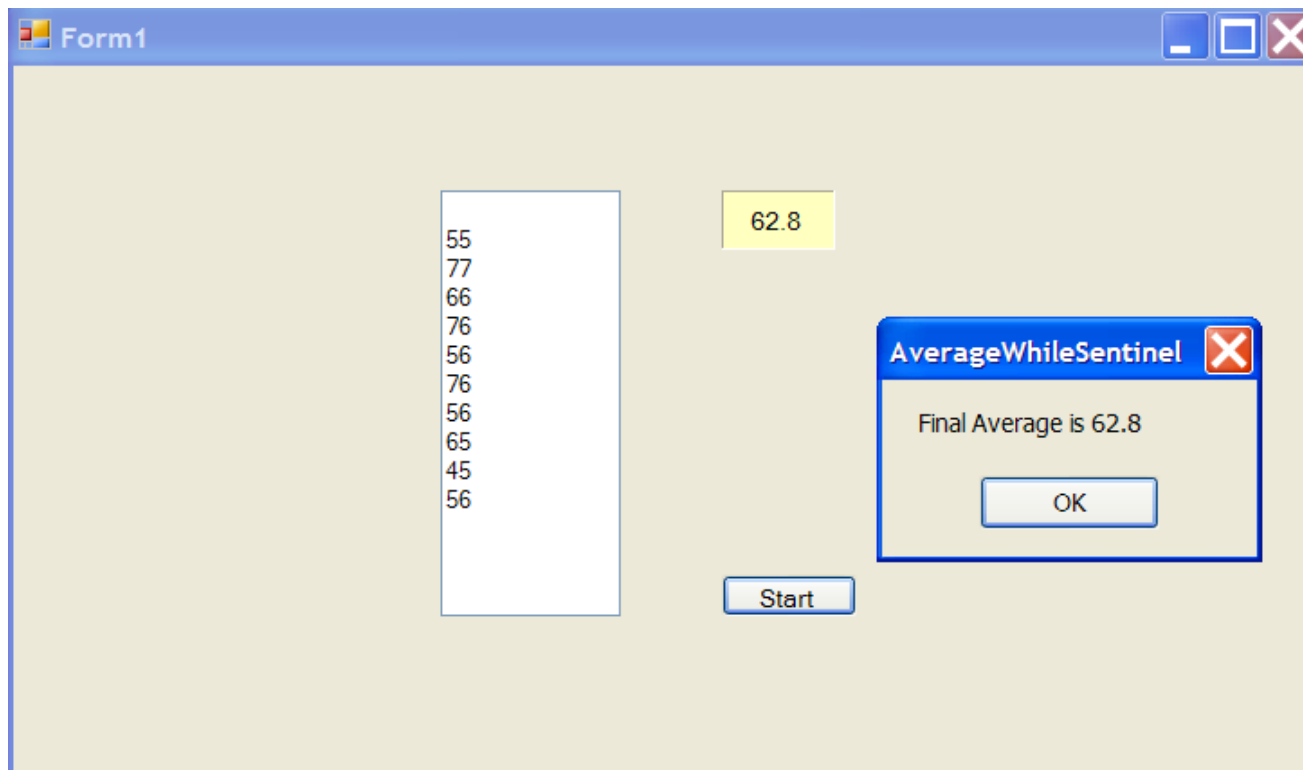
**Divide the tally or sum of all random numbers random numbers by the number of random numbers to get an average.**

# Score Average

Often the user will not know ahead of time how many times the loop will need to occur. In cases like this a flag or sentinel value can be used.

In the following program we will prompt the user to enter as many numbers as they like. Each value is added to a tally within a while loop. When they are
finished typing in numbers they type in a special character of their choice which signals the program that it should break out of the loop.
This special character is called the flag/or sentinel.

# The Code

```vb
Public Class Form1
    Dim flag As Integer
    Dim entry As Integer
    Dim tally As Integer
    Dim average As Double
    Dim wrap As String = Chr(13) & Chr(10)
    Dim count As Integer


    Private Sub btnStart_Click(ByVal sender As System.Object, ByVal e As Syst

        entry = Val(InputBox("Enter value for averaging or -1 to quit"))

        While (entry <> -1)
            tally = tally + entry
            count = count + 1
            txtNumbers.Text = txtNumbers.Text & wrap & entry
            average = tally / count
            lblAverage.Text = average
            entry = Val(InputBox("Enter value for averaging or -1 to quit"))

        End While
        MsgBox("Final Average is " & average)
    End Sub
End Class
```