

COMPUTATIONAL METHODS

Visual Basic Programming – Demonstration Program 6

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' Loops - demonstrate some looping statements and arrays
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Public Class Form1
    ' global variable to hold number of data values
    Dim dcount As Integer
    ' array to hold data as numbers
    Dim dnum(100) As Double
    ' function to load text box from data array
    Sub LoadTextBox()
        ' array to hold data as strings
        Dim dnumtxt(dcount) As String
        ' convert data values to strings
        For i As Integer = 0 To dcount - 1
            dnumtxt(i) = dnum(i).ToString("F06")
        Next
        ' put the strings into the edit box joined by new lines
        TextBox1.Text = String.Join(vbNewLine, dnumtxt)
    End Sub
    ' function to unload text box back into data array
    Sub UnloadTextBox()
        ' split the text at these characters
        Dim seps() As Char = {" ", vbTab, vbCr, vbLf, ",", ""}
        ' array to hold data as strings
        Dim dnumtxt() As String = TextBox1.Text.Split(seps,
System.StringSplitOptions.RemoveEmptyEntries)
        ' process the list of strings one at a time
        Dim dval As Double
        dcount = 0
        ' stop processing as soon as we hit an illegal value
        While (dcount < dnumtxt.Length) AndAlso
Double.TryParse(dnumtxt(dcount), dval)
            ' this one OK, so save to data array
            dnum(dcount) = dval
            dcount = dcount + 1
        End While
    End Sub
    ' function to add a string to the list box
    Sub AddStatistic(ByVal name As String, ByVal value As Double)
        ListBox1.Items.Add(name & " = " & value.ToString("F06"))
    End Sub
    ' perform some simple data analysis
    Sub AnalyseData()
        ' clear the list box
        ListBox1.Items.Clear()
        ' add a count statistics
        AddStatistic("Count ", dcount)
        If (dcount > 0) Then
            ' calculate a mean statistic
            Dim mean As Double = 0
            For i As Integer = 0 To dcount - 1
                mean += dnum(i)
            Next
            mean /= dcount
            AddStatistic("Mean ", mean)
        End If
    End Sub
End Class
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' calculate a standard deviation statistic
If (dcount > 1) Then
    Dim dev As Double = 0
    For i As Integer = 0 To dcount - 1
        dev += (dnum(i) - mean) * (dnum(i) - mean)
    Next
    dev = Math.Sqrt(dev / (dcount - 1))
    AddStatistic("Stddev", dev)
End If
' calculate a median statistic
Array.Sort(dnum, 0, dcount)
Dim median As Double
If (dcount Mod 2) = 1 Then
    median = dnum(dcount \ 2)
Else
    median = (dnum(dcount \ 2 - 1) + dnum(dcount \ 2)) / 2
End If
AddStatistic("Median", median)
End If
End Sub
Private Sub Form1_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
    ' initialise data to some random numbers
    dcount = 20
    For i As Integer = 0 To dcount - 1
        dnum(i) = Rnd()
    Next
    LoadTextBox()
    AnalyseData()
End Sub

Private Sub TextBox1_TextChanged(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles TextBox1.TextChanged
    ' reanalyse the data dynamically, as it is edited
    UnloadTextBox()
    AnalyseData()
End Sub
End Class

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Value	Statistic	Value
0.705548	Count	20.000000
0.533424	Mean	0.558612
0.579519	Stddev	0.307928
0.289562	Median	0.642534
0.301948		
0.774740		
0.014018		
0.760724		
0.814490		
0.709038		
0.045353		
0.414033		