Lab #7 Solution
CE 311K - McKinney

Code:

```
Private Sub cmdGo_Click()

    Const cols = 3
    Dim rows As Integer, i As Integer, j As Integer

    Dim A() As Single

    Call getMatrix(A(), rows, cols)
    Call sortMatrix(A(), rows, cols)
    Call Exceedance(A(), rows, cols)
    Call putMatrix(A(), rows, cols)
    Call Plot(A(), rows, cols)

End Sub

Private Sub getMatrix(A() As Single, rows As Integer, cols As Integer)
' Sub to open file and read matrix from the file

    Dim i As Integer, j As Integer
    CommonDialog1.ShowOpen
    Open CommonDialog1.FileName For Input As #1
    Input #1, rows
    ReDim A(rows, cols) As Single
    For i = 1 To rows
        For j = 1 To 2
            Input #1, A(i, j)
        Next j
    Next i
End Sub

Private Sub putMatrix(A() As Single, rows As Integer, cols As Integer)
' Sub to open file and write a matrix to the file

    Dim i As Integer, j As Integer
    CommonDialog1.ShowSave
    Open CommonDialog1.FileName For Output As #2
    For i = 1 To rows
        For j = 1 To cols
            Print #2, A(i, j);
        Next j
        Print #2,
    Next i
End Sub

Private Sub sortMatrix(A() As Single, rows As Integer, cols As Integer)
' Sub to sort a matrix

    Dim i As Integer, j As Integer
    Dim temp1 As Single, temp2 As Single
    For j = 2 To rows
```

```vb
            temp1 = A(j, 1)
            temp2 = A(j, 2)
            i = j - 1
            Do While (i > 0 And A(i, 2) > temp2)
                A(i + 1, 1) = A(i, 1)
                A(i + 1, 2) = A(i, 2)
                i = i - 1
            Loop
            A(i + 1, 1) = temp1
            A(i + 1, 2) = temp2
    Next
End Sub

Private Sub Exceedance(A() As Single, rows As Integer, cols As Integer)
' Sub to compute the exceedance probabilities and put them in a matrix

    Dim i As Integer, j As Integer
    For i = 1 To rows
        A(i, 3) = 1# - i / (rows + 1)
    Next
End Sub

Private Sub Plot(A() As Single, rows As Integer, cols As Integer)
' Sub to plot the flow duration graph

    Dim i As Integer, j As Integer
    With picOutput
        .ScaleTop = 25000
        .ScaleHeight = -25000
        .ScaleLeft = 0
        .ScaleWidth = 1
    End With

    With picOutput
        .DrawWidth = 5
        .ForeColor = RGB(255, 0, 0)
        .CurrentX = A(1, 3)
        .CurrentY = A(1, 2)
    End With
    For i = 2 To rows Step 1
            picOutput.Line -((A(i, 3)), (A(i, 2)))
    Next i
End Sub

Private Sub cmdStop_Click()
    End
End Sub
```
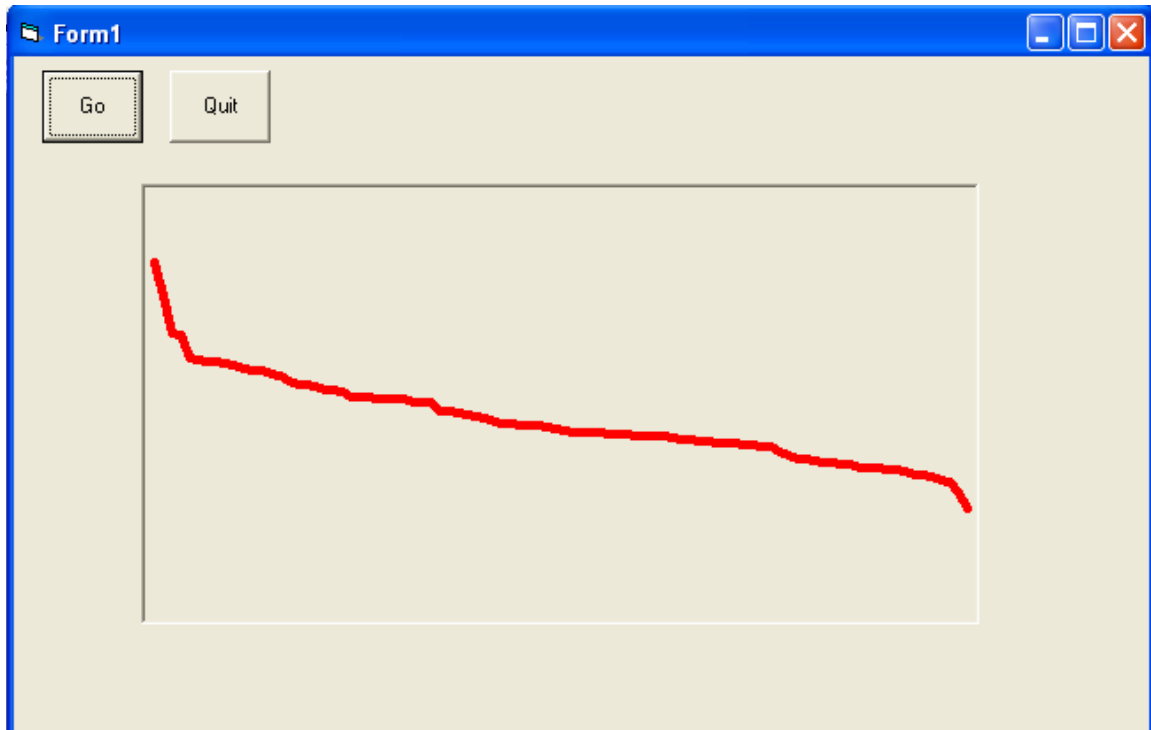
Output:

Incomplete listing of output file:

```
 1917   6525   0.9892473
 1927   7478   0.9784946
 1938   8014   0.9677419
 1947   8161   0.9569892
…
 1969   18754   2.150538E-02
 1921   20725   1.075269E-02
```