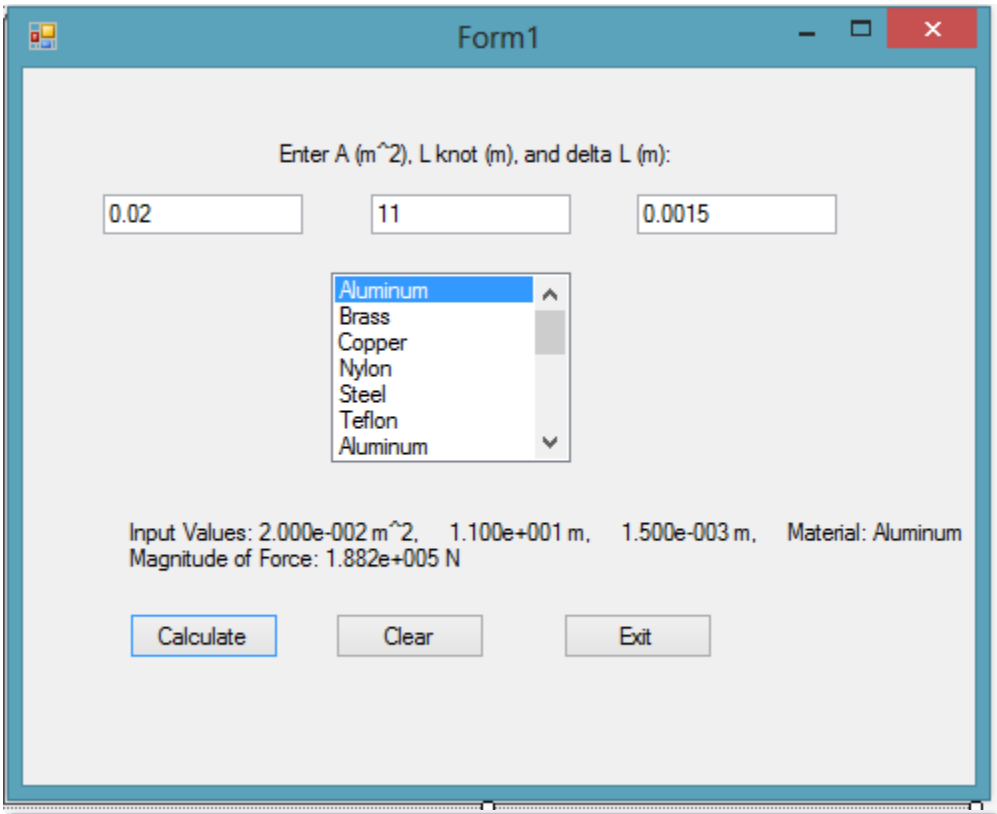
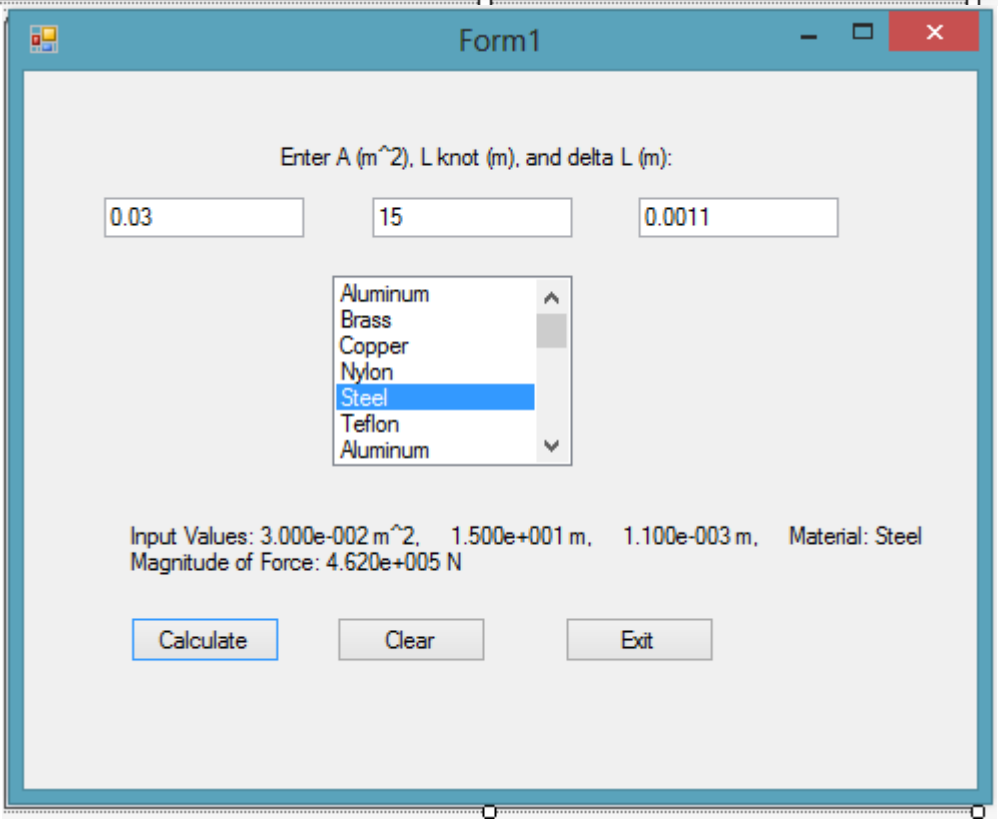
Question 1:

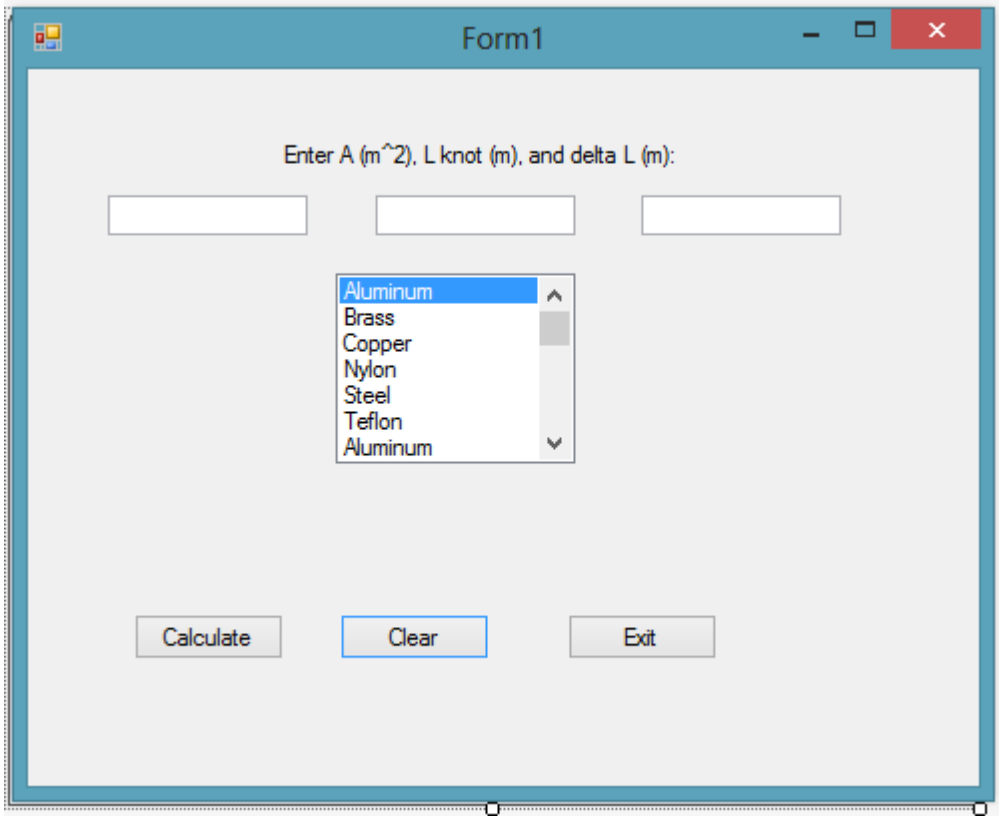
```
Imports System.IO

Public Class Form1 'Ilker Hadzhalaran

    Private Sub Form1_Load(sender As Object, e As EventArgs) Handles MyBase.Load

        Dim outFile As StreamWriter

        outFile = File.CreateText("C:\Users\Ilker\Desktop\Materials_And_Y.txt")
        outFile.WriteLine("Aluminum" & "," & 6.9)
        outFile.WriteLine("Brass" & "," & 9.0)
        outFile.WriteLine("Copper" & "," & 11.0)
        outFile.WriteLine("Nylon" & "," & 0.37)
        outFile.WriteLine("Steel" & "," & 21.0)
        outFile.WriteLine("Teflon" & "," & 0.037)

        txtInputA.Clear()
        txtInputDeltaL.Clear()
        txtInputLKnot.Clear()
        lblDisplayResults.Text = String.Empty


        outFile.Close()

        Dim inputFile As StreamReader
        Dim Array(1) As String
        Dim dblArray(5) As Double
        Dim strMaterialName As String

        inputFile = File.OpenText("C:\Users\Ilker\Desktop\Materials_And_Y.txt")

        For intCounter As Integer = 0 To 5 Step 1

            Array = Split(inputFile.ReadLine(), ",")

            strMaterialName = Array(0)
            lstMaterialsList.Items.Add(strMaterialName)


        Next intCounter

        inputFile.Close()

        lstMaterialsList.SelectedIndex = 0


    End Sub

    Private Sub btnCalculate_Click(sender As Object, e As EventArgs) Handles
btnCalculate.Click

        Dim dblInputA, dblInputLKnot, dblInputDeltaL, dblForceMagnitude As Double
        Dim intIndexOfListBox As Integer
```

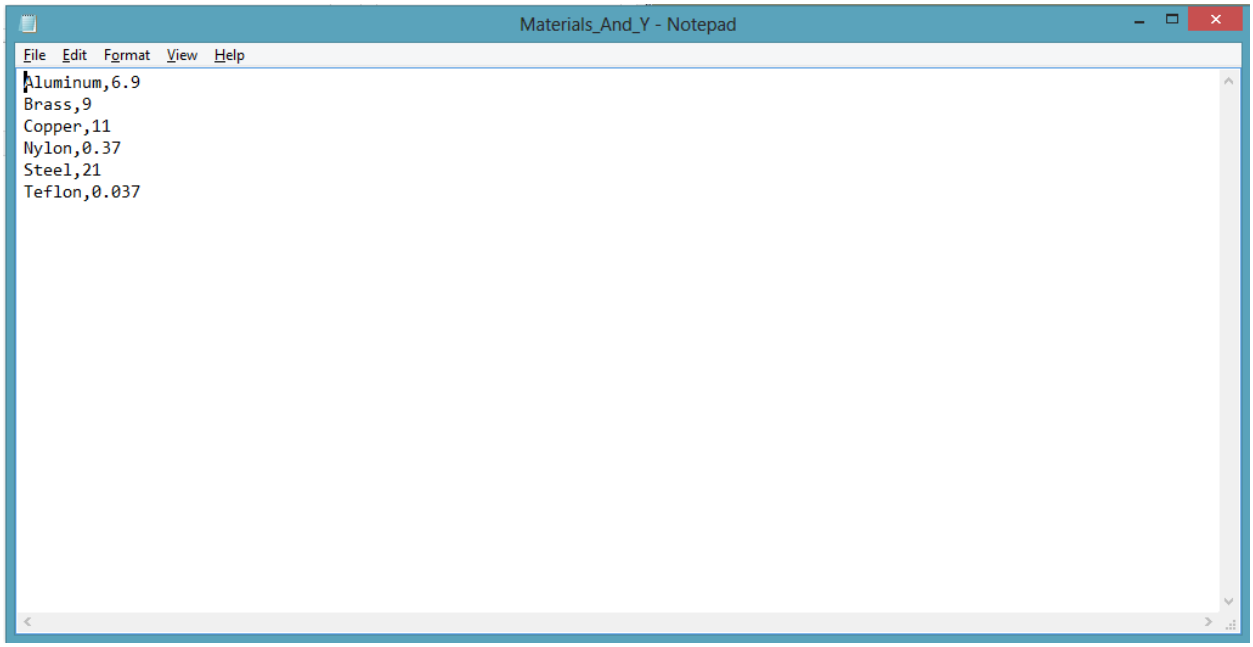
```
        Dim dblArrayYoungModulus(5) As Double
        Dim strReadArray(1) As String
        Dim dblYoungMod As Double
        Dim strMaterialName As String

        Dim inputFile As StreamReader
        inputFile = File.OpenText("C:\Users\Ilker\Desktop\Materials_And_Y.txt")

        For intCounter As Integer = 0 To 5 Step 1
            '
            strReadArray = Split(inputFile.ReadLine(), ",")

            strMaterialName = strReadArray(0)
            dblYoungMod = CDbl(strReadArray(1))

            lstMaterialsList.Items.Add(strMaterialName)

            dblArrayYoungModulus(intCounter) = dblYoungMod


        Next intCounter

        inputFile.Close()


        dblInputA = CDbl(txtInputA.Text)
        dblInputLKnot = CDbl(txtInputLKnot.Text)
        dblInputDeltaL = CDbl(txtInputDeltaL.Text)

        If dblInputA < 0.01 Or dblInputA > 0.2 Then
            MsgBox("0.01 <= A <= 0.2")
            Exit Sub
        End If

        If dblInputLKnot < 10 Or dblInputLKnot > 20 Then
            MsgBox("10 <= L knot <= 20")
            Exit Sub
        End If

        If dblInputDeltaL <= 0 Or dblInputDeltaL > (1.5 * 10 ^ -3) Then
            MsgBox("0 < delta L <= 1.5 * 10^-3")
            Exit Sub
        End If


        Try

            intIndexOfListBox = lstMaterialsList.SelectedIndex

            dblForceMagnitude = (dblArrayYoungModulus(intIndexOfListBox) * 10 ^ 10) *
(dblInputDeltaL / dblInputLKnot) * dblInputA
            lblDisplayResults.Text = "Input Values: " & (dblInputA).ToString("e3") & "
m^2," & Space(5) & (dblInputLKnot).ToString("e3") & " m," & Space(5) &
(dblInputDeltaL).ToString("e3") & " m," & Space(5) & "Material: " &
lstMaterialsList.SelectedItem
            lblDisplayResults.Text &= vbCr & "Magnitude of Force: " &
(dblForceMagnitude).ToString("e3") & " N"
```

```
        Catch ex As Exception
            MessageBox.Show(ex.Message)
        End Try

    End Sub

    Private Sub btnClear_Click(sender As Object, e As EventArgs) Handles btnClear.Click
        txtInputA.Clear()
        txtInputDeltaL.Clear()
        txtInputLKnot.Clear()
        lblDisplayResults.Text = String.Empty
        lstMaterialsList.SelectedIndex = 0

    End Sub

    Private Sub btnExit_Click(sender As Object, e As EventArgs) Handles btnExit.Click
        Me.Close()
    End Sub
End Class
```


Form1
Enter A (m^2), L knot (m), and delta L (m):
0.02
11
0.0015
Aluminum
Brass
Copper
Nylon
Steel
Teflon
Aluminum
Input Values: 2.000e-002 m^2, 1.100e+001 m, 1.500e-003 m, Material: Aluminum
Magnitude of Force: 1.882e+005 N
Calculate
Clear
Exit


Form1
Enter A (m^2), L knot (m), and delta L (m):
0.03
15
0.0011
Aluminum
Brass
Copper
Nylon
Steel
Teflon
Aluminum
Input Values: 3.000e-002 m^2, 1.500e+001 m, 1.100e-003 m, Material: Steel
Magnitude of Force: 4.620e+005 N
Calculate
Clear
Exit

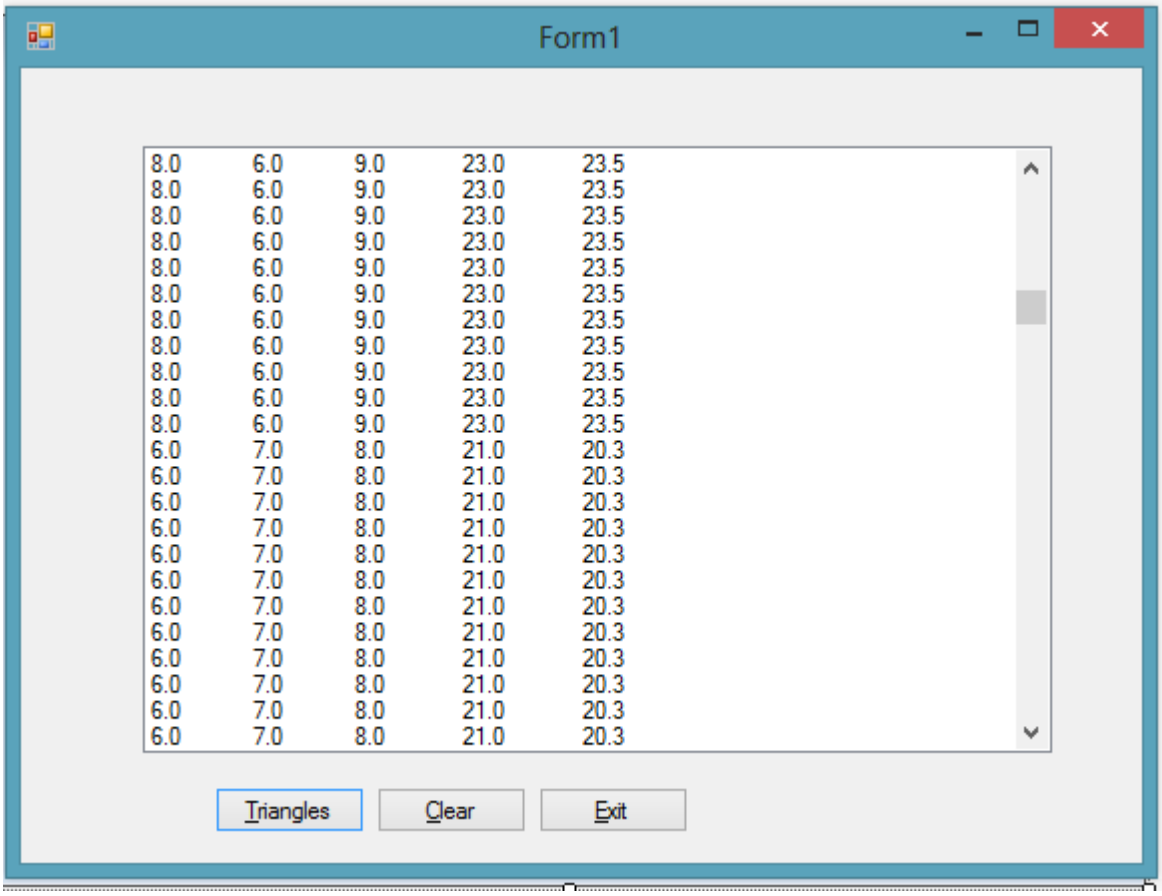

Form1
Enter A (m^2), L knot (m), and delta L (m):
Aluminum
Brass
Copper
Nylon
Steel
Teflon
Aluminum
Calculate
Clear
Exit

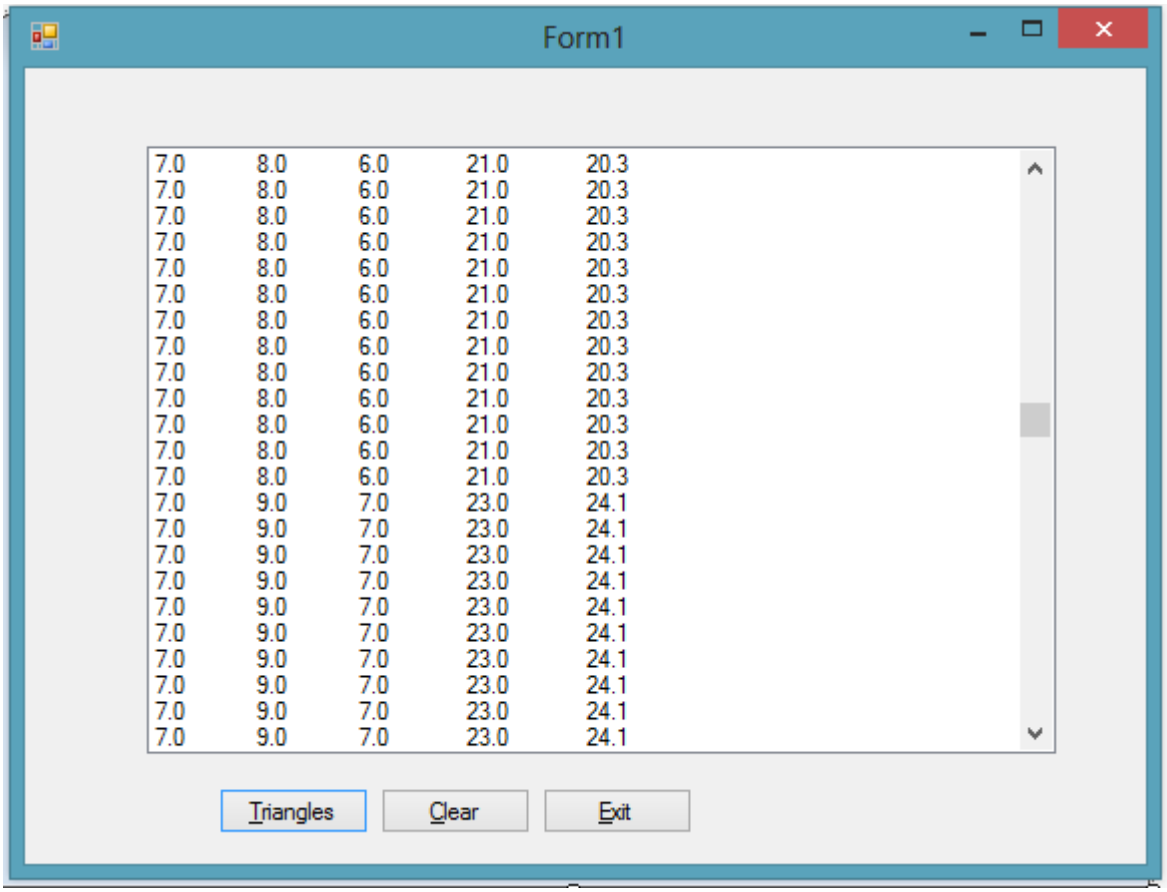

Materials_And_Y - Notepad
File Edit Format View Help
Aluminum,6.9
Brass,9
Copper,11
Nylon,0.37
Steel,21
Teflon,0.037

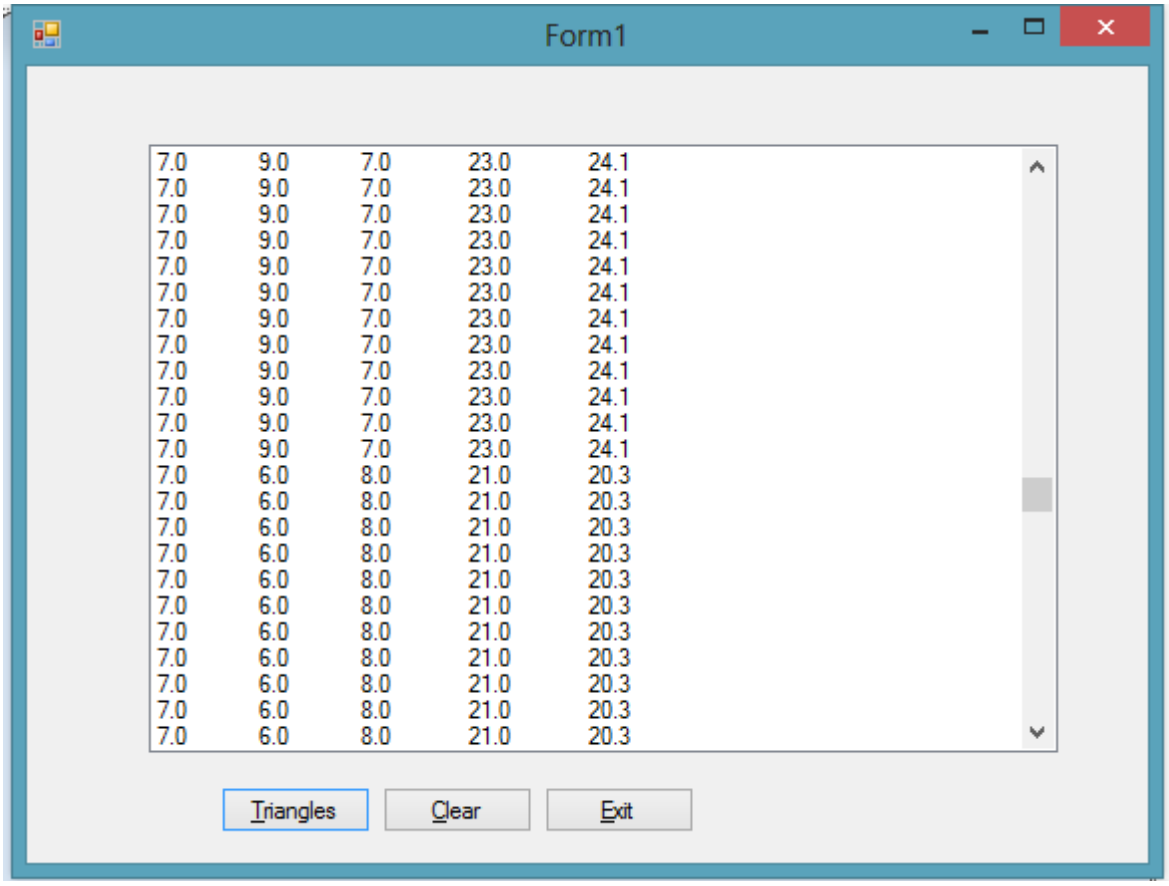
Question 2:

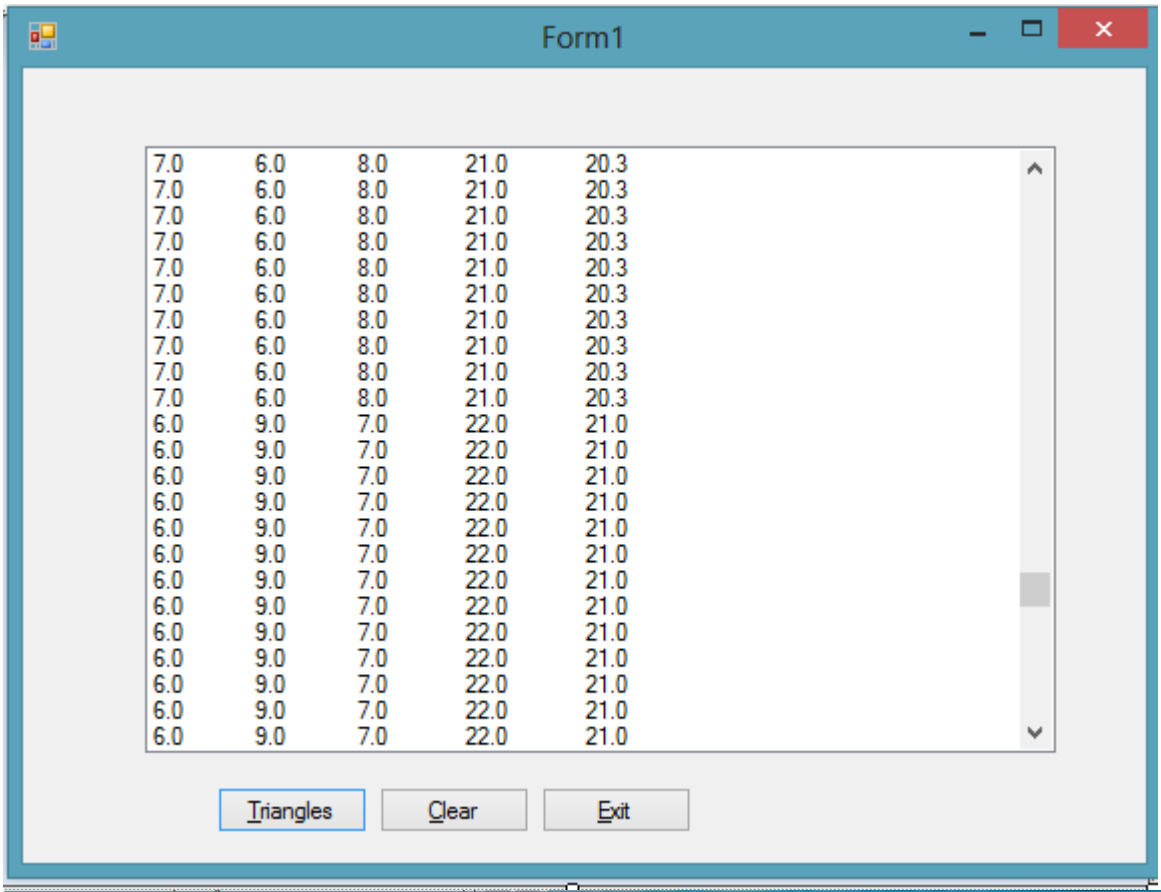
```
Imports System.IO
Public Class Form1 'Ilker Hadzhalaran


    Private Sub btnExit_Click(sender As Object, e As EventArgs) Handles btnExit.Click
        Me.Close()
    End Sub

    Private Sub btnClear_Click(sender As Object, e As EventArgs) Handles btnClear.Click
        lstDisplayResults.Items.Clear()
        lstDisplayResults.Items.Add("Side A:     Side B:     Side C:     Perimeter:
Area:")
    End Sub

    Private Sub Form1_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        lstDisplayResults.Items.Add("Side A:     Side B:     Side C:     Perimeter:
Area:")
    End Sub



    Private Sub btnTriangles_Click(sender As Object, e As EventArgs) Handles
btnTriangles.Click

        Dim dblA, dblB, dblC, dblHalfPerimeter, dblPerimeter, dblArea As Double
        Dim rand As New Random()
        Randomize()
        Dim outFile As StreamWriter
        Dim inputFile As StreamReader
        Dim dblReadA, dblReadB, dblReadC As Double

        outFile = File.AppendText("C:\Users\Ilker\Desktop\100_Triangles.txt")


        For intCounter As Integer = 1 To 100 Step 1

            getTriangleSides(dblA, dblB, dblC)

            outFile.WriteLine(dblA)
            outFile.WriteLine(dblB)
            outFile.WriteLine(dblC)

        Next intCounter

        outFile.Close()

        inputFile = File.OpenText("C:\Users\Ilker\Desktop\100_Triangles.txt")

        Do Until inputFile.EndOfStream

            dblReadA = CDbl(inputFile.ReadLine())
            dblReadB = CDbl(inputFile.ReadLine())
            dblReadC = CDbl(inputFile.ReadLine())

            getProperties(dblA, dblB, dblC, dblPerimeter, dblHalfPerimeter, dblArea)
```

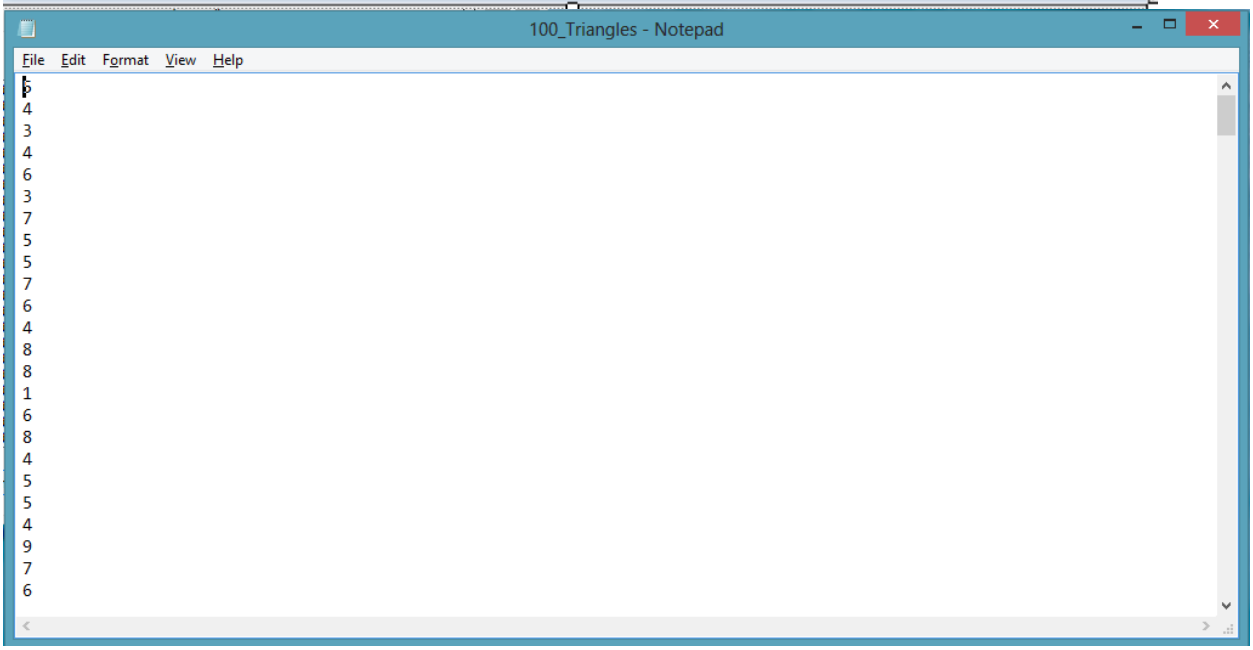
```
            If dblArea >= 20 And dblArea <= 25 Then
                lstDisplayResults.Items.Add(dblA.ToString("n1") & "            " &
dblB.ToString("n1") & "            " & dblC.ToString("n1") & "            " &
dblPerimeter.ToString("n1") & "            " & dblArea.ToString("n1"))

            End If

        Loop

        inputFile.Close()


    End Sub



    Private Sub getTriangleSides(ByRef dblA As Double, ByRef dblB As Double, ByRef dblC
As Double)

        Do Until (((dblA + dblB) > dblC) And ((dblB + dblC) > dblA) And ((dblA + dblC) >
dblB))

            Dim rand As New Random()
            Randomize()

            dblA = rand.Next(10)
            dblB = rand.Next(10)
            dblC = rand.Next(10)
        Loop

    End Sub



    Private Sub getProperties(ByVal dblA As Double, ByVal dblB As Double, ByVal dblC As
Double, ByRef dblPerimeter As Double, ByRef dblHalfPerimeter As Double, ByRef dblArea As
Double)

        dblPerimeter = dblA + dblB + dblC
        dblHalfPerimeter = dblPerimeter / 2

        dblArea = (dblHalfPerimeter * (dblHalfPerimeter - dblA) * (dblHalfPerimeter -
dblB) * (dblHalfPerimeter - dblC)) ^ 0.5



    End Sub


End Class
```

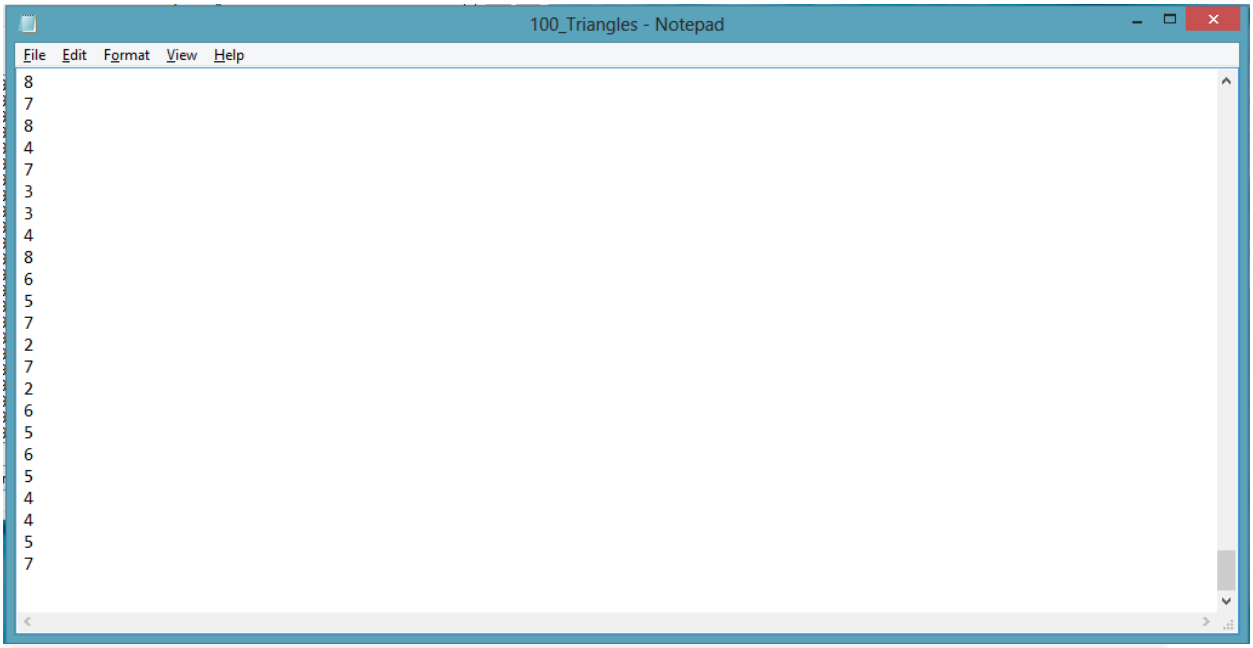

Form1
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
Triangles
Clear
Exit

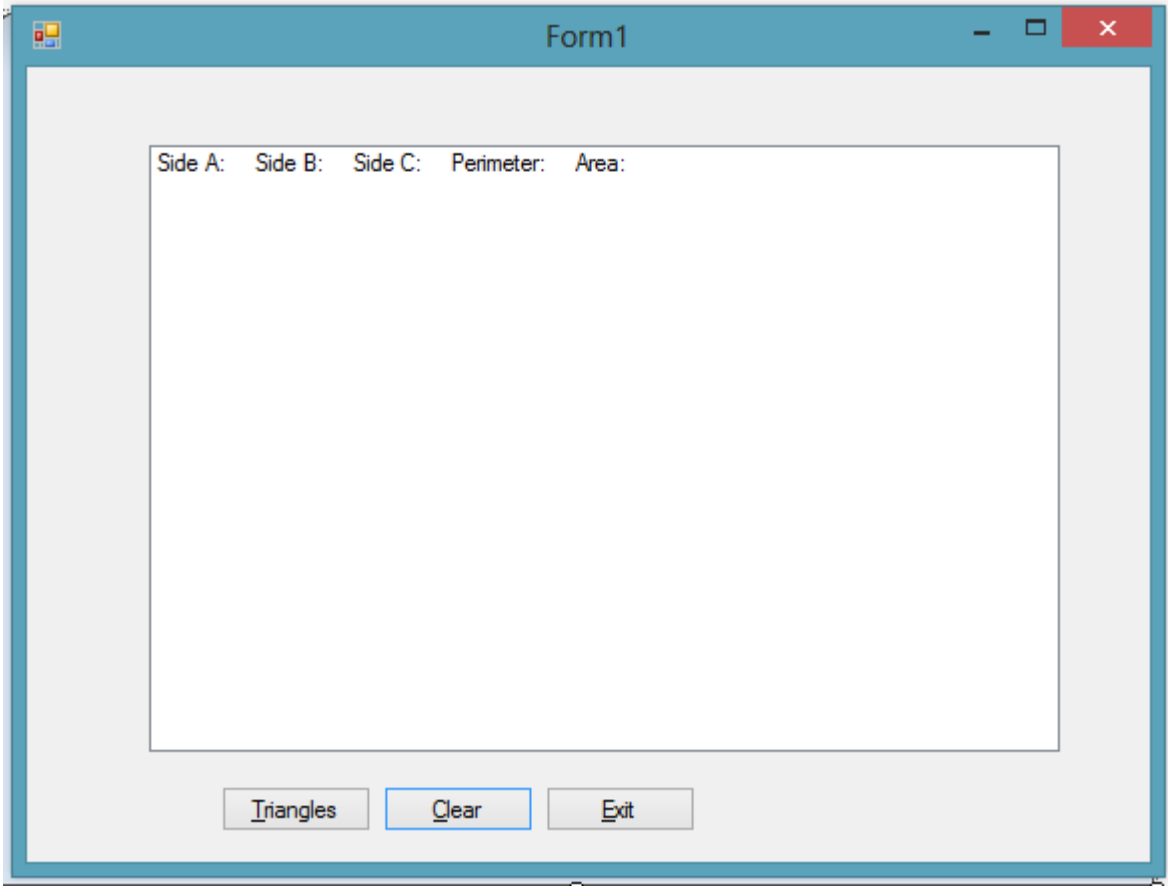

Form1
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 8.0 6.0 21.0 20.3
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
Triangles
Clear
Exit

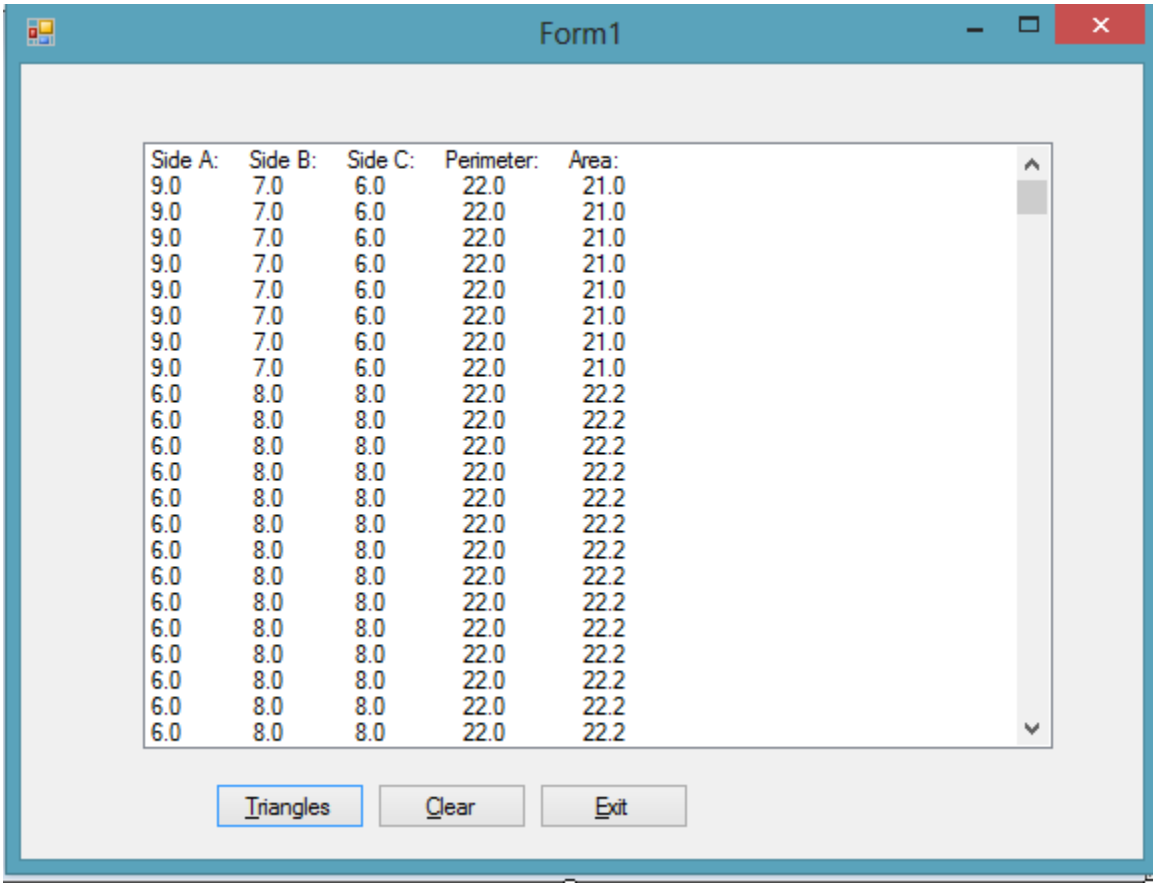

Form1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 9.0 7.0 23.0 24.1
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
Triangles
Clear
Exit

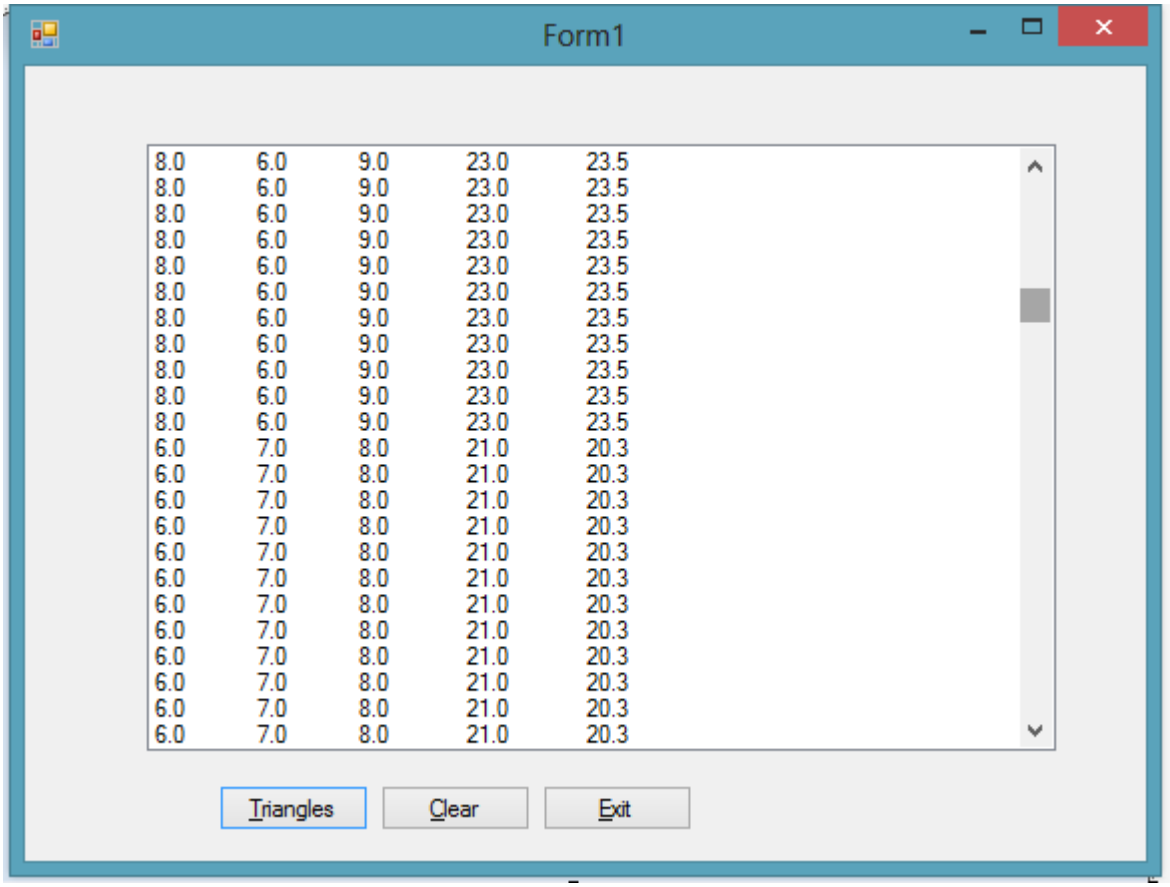

Form1
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
7.0 6.0 8.0 21.0 20.3
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
6.0 9.0 7.0 22.0 21.0
Triangles
Clear
Exit


100_Triangles - Notepad
File Edit Format View Help
6
4
3
4
6
3
7
5
5
7
6
4
8
8
1
6
8
4
5
5
4
9
7
6


100_Triangles - Notepad
File Edit Format View Help
8
7
8
4
7
3
3
4
8
6
5
7
2
7
2
6
5
6
5
4
4
5
7


Form1
Side A: Side B: Side C: Perimeter: Area:
Triangles
Clear
Exit


Form1
Side A: Side B: Side C: Perimeter: Area:
9.0 7.0 6.0 22.0 21.0
9.0 7.0 6.0 22.0 21.0
9.0 7.0 6.0 22.0 21.0
9.0 7.0 6.0 22.0 21.0
9.0 7.0 6.0 22.0 21.0
9.0 7.0 6.0 22.0 21.0
9.0 7.0 6.0 22.0 21.0
9.0 7.0 6.0 22.0 21.0
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
6.0 8.0 8.0 22.0 22.2
Triangles
Clear
Exit

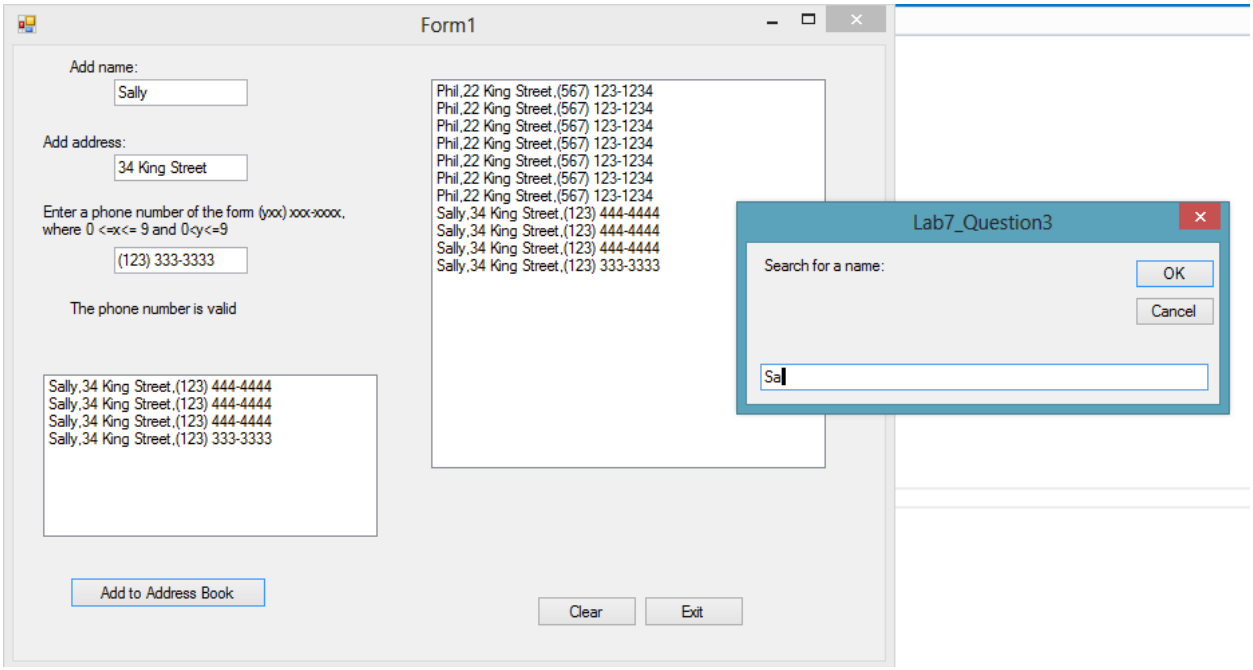

Form1
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
8.0 6.0 9.0 23.0 23.5
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
6.0 7.0 8.0 21.0 20.3
Triangles
Clear
Exit

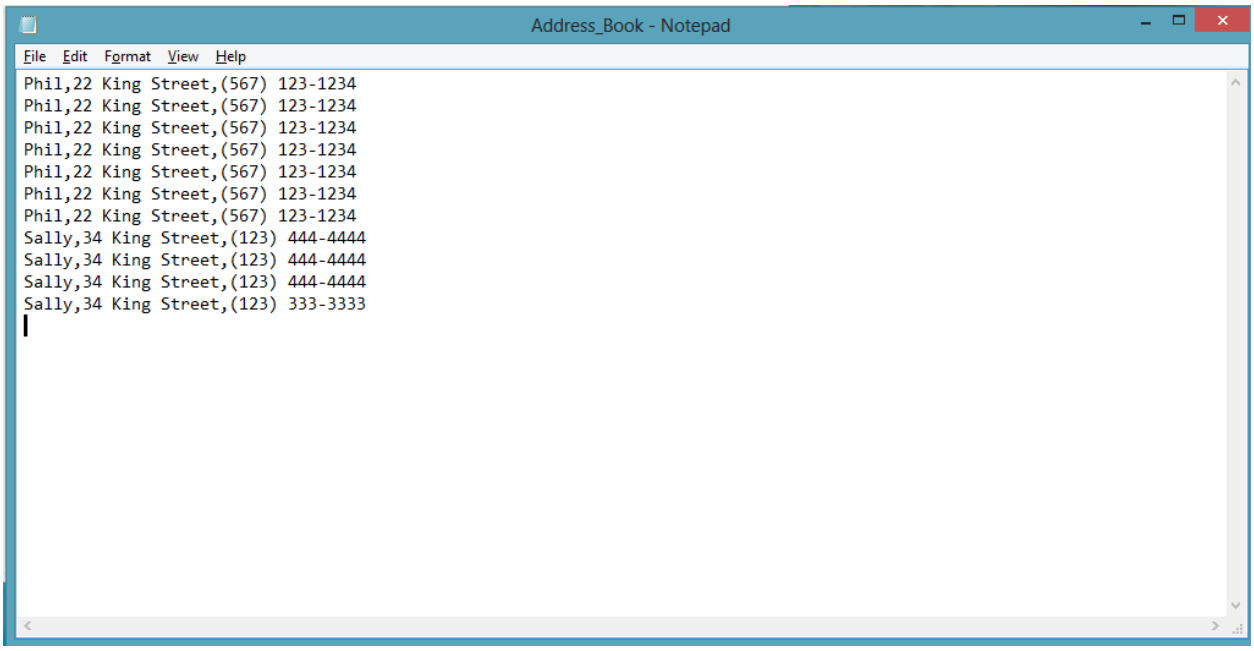
Question 3:

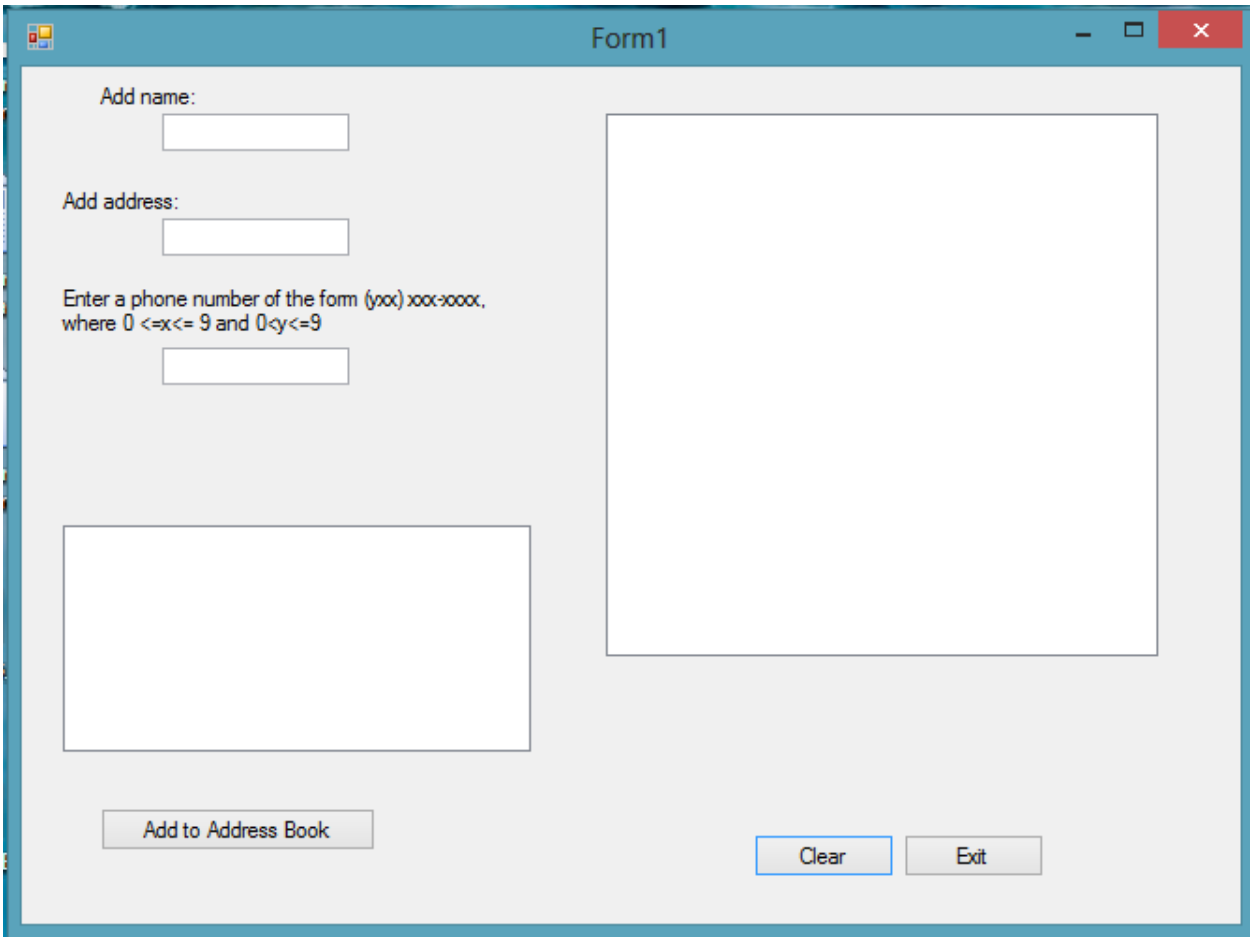
```
Imports System.IO

Public Class Form1   'Ilker Hadzhalaran

    Private Sub btnExit_Click(sender As Object, e As EventArgs) Handles btnExit.Click
        Me.Close()
    End Sub

    Private Sub btnClear_Click(sender As Object, e As EventArgs) Handles btnClear.Click
        txtUserInput.Clear()
        lblDisplayResult.Text = String.Empty
        txtAddAddress.Clear()
        txtAddName.Clear()
        lstAddressBook.Items.Clear()
        lstSearchResults.Items.Clear()
    End Sub

    Private Sub btnAdd_Click(sender As Object, e As EventArgs) Handles btnAdd.Click


        Dim strName, strAddress, strPhoneNumber As String
        Dim intIndividualNumber As Integer
        Dim blnPhoneNumberIsValid As Boolean = True
        Dim strReadContact As String
        Dim strSearchQuery As String

        Dim outFile As StreamWriter
        outFile = File.AppendText("C:\Users\Ilker\Desktop\Address_Book.txt")

        strName = txtAddName.Text
        strAddress = txtAddAddress.Text
        strPhoneNumber = txtUserInput.Text


        If Not (Integer.TryParse(strPhoneNumber.Substring(1, 1), intIndividualNumber) And
0 < CInt(strPhoneNumber.Substring(1, 1)) <= 9 And CInt(strPhoneNumber.Substring(1, 1)) <>
0) Then

            blnPhoneNumberIsValid = False

        End If

        If Not (Integer.TryParse(strPhoneNumber.Substring(2, 1), intIndividualNumber) And
0 <= strPhoneNumber.Substring(2, 1) <= 9) Then
            blnPhoneNumberIsValid = False
        End If


        If Not (Integer.TryParse(strPhoneNumber.Substring(3, 1), intIndividualNumber) And
0 <= strPhoneNumber.Substring(3, 1) <= 9) Then
            blnPhoneNumberIsValid = False
        End If

        If Not (Integer.TryParse(strPhoneNumber.Substring(6, 1), intIndividualNumber) And
0 <= strPhoneNumber.Substring(6, 1) <= 9) Then
```

```
            blnPhoneNumberIsValid = False

        End If

        If Not (Integer.TryParse(strPhoneNumber.Substring(7, 1), intIndividualNumber) And
0 <= strPhoneNumber.Substring(7, 1) <= 9) Then

            blnPhoneNumberIsValid = False

        End If


        If Not (Integer.TryParse(strPhoneNumber.Substring(8, 1), intIndividualNumber) And
0 <= strPhoneNumber.Substring(8, 1) <= 9) Then
            blnPhoneNumberIsValid = False

        End If

        If Not (Integer.TryParse(strPhoneNumber.Substring(10, 1), intIndividualNumber)
And 0 <= strPhoneNumber.Substring(10, 1) <= 9) Then

            blnPhoneNumberIsValid = False

        End If

        If Not (Integer.TryParse(strPhoneNumber.Substring(11, 1), intIndividualNumber)
And 0 <= strPhoneNumber.Substring(11, 1) <= 9) Then
            blnPhoneNumberIsValid = False

        End If

        If Not (Integer.TryParse(strPhoneNumber.Substring(12, 1), intIndividualNumber)
And 0 <= strPhoneNumber.Substring(12, 1) <= 9) Then
            blnPhoneNumberIsValid = False

        End If

        If Not (Integer.TryParse(strPhoneNumber.Substring(13, 1), intIndividualNumber)
And 0 <= strPhoneNumber.Substring(13, 1) <= 9) Then

            blnPhoneNumberIsValid = False

        End If

        If Not strPhoneNumber.Substring(0, 1) = "(" Then

            blnPhoneNumberIsValid = False

        End If

        If Not strPhoneNumber.Substring(4, 1) = ")" Then

            blnPhoneNumberIsValid = False

        End If

        If Not strPhoneNumber.Substring(5, 1) = " " Then
```

```
            blnPhoneNumberIsValid = False

        End If

        If Not strPhoneNumber.Substring(9, 1) = "-" Then

            blnPhoneNumberIsValid = False

        End If


        If blnPhoneNumberIsValid = True Then
            lblDisplayResult.Text = "The phone number is valid"
        Else
            lblDisplayResult.Text = "The phone number is not valid"
            Exit Sub
        End If


        outFile.WriteLine(strName & "," & strAddress & "," & strPhoneNumber)
        outFile.Close()

        Dim inputFile As StreamReader
        inputFile = File.OpenText("C:\Users\Ilker\Desktop\Address_Book.txt")

        strSearchQuery = InputBox("Search for a name: ")

        Do Until inputFile.EndOfStream
            strReadContact = inputFile.ReadLine()
            lstAddressBook.Items.Add(strReadContact)

            If (strReadContact.ToUpper()).IndexOf(strSearchQuery.ToUpper()) Then
                lstSearchResults.Items.Add(strReadContact)
            End If

        Loop

        inputFile.Close()
    End Sub
End Class
```


Form1
Add name:
Sally
Add address:
34 King Street
Enter a phone number of the form (yxx) xxx-xxxx, where 0 <=x<= 9 and 0<y<=9
(123) 333-3333
The phone number is valid
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 333-3333
Add to Address Book
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 333-3333
Clear
Exit
Lab7_Question3
Search for a name:
OK
Cancel
Sa


Address_Book - Notepad
File Edit Format View Help
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Phil,22 King Street,(567) 123-1234
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 444-4444
Sally,34 King Street,(123) 333-3333


Form1
Add name:
Add address:
Enter a phone number of the form (yxx) xxx-xxxx,
where 0 <=x<= 9 and 0<y<=9
Add to Address Book
Clear
Exit