

CE311K – Lab 9 Solution

```
Public Class Form1
```

```
    Private Sub Button1_Click(ByVal sender As System.Object, ByVal l As  
System.EventArgs) Handles Button1.Click
```

```
        Dim x1 As Double, x3 As Double, x2 As Double  
        Dim fx1 As Double, fx2 As Double, fx3 As Double  
        Dim iter As Integer, err As Double  
        Dim maxiter As Double
```

```
        Dim sr As IO.StreamReader =  
IO.File.OpenText("c:\temp\lab9in.txt")  
        Dim sw As IO.StreamWriter =  
IO.File.CreateText("c:\temp\lab9out.txt")  
        Dim line, text() As String  
        Dim e, d, re As Double
```

```
        maxiter = 500  
        err = 0.000001
```

```
        For i = 1 To 2
```

```
            x1 = Textx1.Text  
            x2 = Textx2.Text  
            line = sr.ReadLine  
            text = line.Split(" ")  
            d = Cdbl(text(0))  
            e = Cdbl(text(1))  
            re = Cdbl(text(2))
```

```
            Do
```

```
                fx1 = func(x1, e, d, re)  
                fx2 = func(x2, e, d, re)
```

```
                If (fx1 * fx2 > 0) Then  
                    ListBox1.Items.Add("root not bounded")
```

```
                Else
```

```
                    x3 = (x1 + x2) / 2  
                    fx3 = func(x3, e, d, re)
```

```
                    If (fx3 * fx1 < 0) Then  
                        x2 = x3
```

```
                    Else  
                        x1 = x3
```

```
                    End If
```

```
                End If
```

```
                iter = iter + 1
```

```
            Loop Until (Math.Abs(x1 - x2) / 2 < err Or fx3 = 0 Or iter  
>= maxiter)
```

```

        ListBox1.Items.Add("D = " & d)
        ListBox1.Items.Add("e = " & e)
        ListBox1.Items.Add("Re = " & re)
        ListBox1.Items.Add("The root of the function is " &
FormatNumber(x3, 4))
        sw.WriteLine("The root for case " & i & " is " &
FormatNumber(x3, 4))
    Next
    sw.Close()
End Sub

Private Function func(ByVal x As Double, ByVal e As Double, ByVal d
As Double, ByVal re As Double) As Double

    func = 1 / Math.Sqrt(x) - 1.14 + 2.0 * (Math.Log10((e / d) +
(9.35 / (re * Math.Sqrt(x)))))

    Return func

End Function

Private Sub Button2_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Button2.Click
    End
End Sub
End Class

```

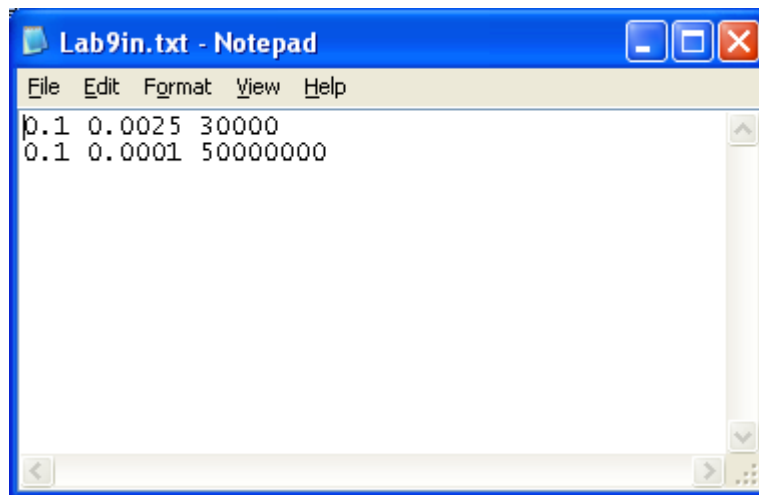
The screenshot shows a Windows application window titled "Form1". It contains two input fields: "x1" with the value ".0001" and "x2" with the value "1". Below these is a text box containing the following output:

```

D = 0.1
e = 0.0025
Re = 30000
The root of the function is 0.0541
D = 0.1
e = 0.0001
Re = 50000000
The root of the function is 0.0196

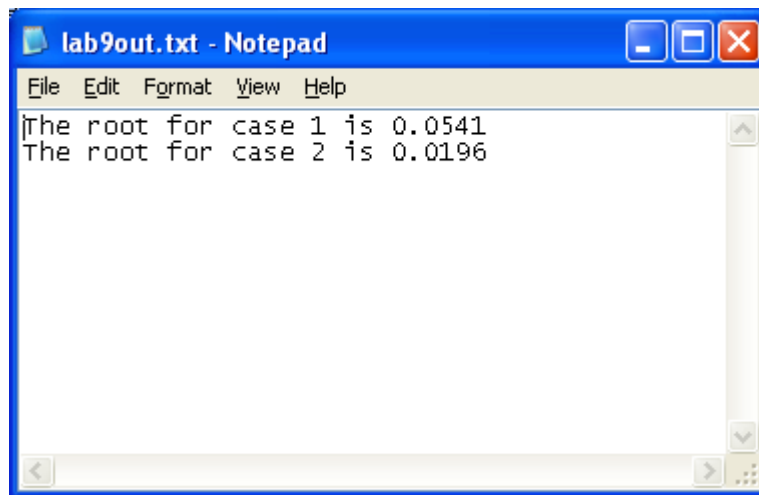
```

At the bottom of the form are two buttons: "Go" and "Stop".



Lab9in.txt - Notepad

```
File Edit Format View Help
0.1 0.0025 30000
0.1 0.0001 50000000
```



lab9out.txt - Notepad

```
File Edit Format View Help
The root for case 1 is 0.0541
The root for case 2 is 0.0196
```