

Option Explicit

Solutions to (e) (Prime Numbers) on "Programming Problems whose Solutions Require the Use of Counted or Conditional Loops." All of the given solutions perform an exhaustive search up to HALF of the number that is entered by the user. In a later version, we shall see that it suffices to check up to the SQUARE ROOT of the number entered by the user.

```
'Solution to (e) Loop Structure #1
Private Sub Command1_Click()

    Dim Num As Long, I As Long

    Num = Val(txtNumber.Text)
    I = 1 'Initialize "I" to 1.

    Do

        I = I + 1 'Increase the value of "I" by 1

    Loop Until Num Mod I = 0 Or I > Num / 2

    If I <= Num / 2 Then
        Label1.Caption = CStr(Num) & " is NOT prime!"
    Else
        Label1.Caption = CStr(Num) & " is prime!"
    End If

End Sub
```

```

'Solution to (e) Loop Structure #2
Private Sub Command2_Click()

    Dim Num As Long, I As Long
    |
    Num = Val(txtNumber.Text)
    I = 2 'Initialize "I" to 2.

    Do Until Num Mod I = 0 Or I > Num / 2

        I = I + 1 'Increase the value of "I" by 1

    Loop

    If I <= Num / 2 Then
        Label1.Caption = CStr(Num) & " is NOT prime!"
    Else
        Label1.Caption = CStr(Num) & " is prime!"
    End If

End Sub

```

'Solution to (e) Loop Structure #3

```
Private Sub Command3_Click()

    Dim Num As Long, I As Long

    Num = Val(txtNumber.Text)
    I = 1 'Initialize "I" to 1.

    Do

        I = I + 1 'Increase the value of "I" by 1

    Loop While Num Mod I <> 0 And I <= Num / 2

    If I <= Num / 2 Then
        Label1.Caption = CStr(Num) & " is NOT prime!"
    Else
        Label1.Caption = CStr(Num) & " is prime!"
    End If

End Sub
```

'Solution to (e) Loop Structure #4

```
Private Sub Command4_Click()

    Dim Num As Long, I As Long

    Num = Val(txtNumber.Text)
    I = 2 'Initialize "I" to 2.

    Do While Num Mod I <> 0 And I <= Num / 2

        I = I + 1 'Increase the value of "I" by 1

    Loop

    If I <= Num / 2 Then
        Label1.Caption = CStr(Num) & " is NOT prime!"
    Else
        Label1.Caption = CStr(Num) & " is prime!"
    End If

End Sub
```