yudi's Step 2 (CrackMe)

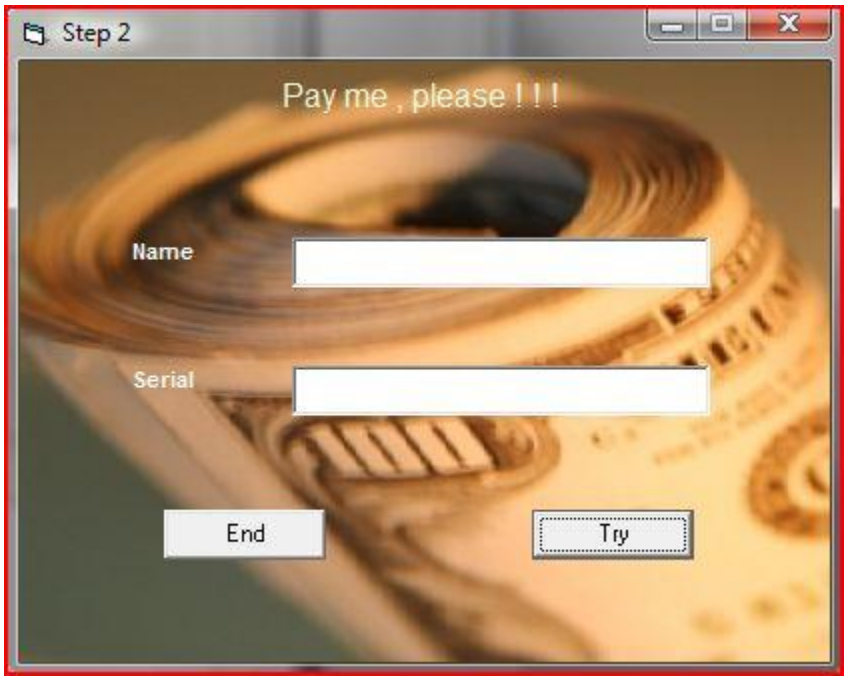
Now that VBReFormer is a well advanced decompiler for Visual Basic application, I was searching for some unsolved crackmes in order to made sample of decompiling for learning purpose.

The website Crackmes.de contains an impressive number of crackmes applications, a perfect source of samples.

For the first sample of CrackMe solving with VBReFormer Professional I decided to take "Step 2" from yudi (more informations).

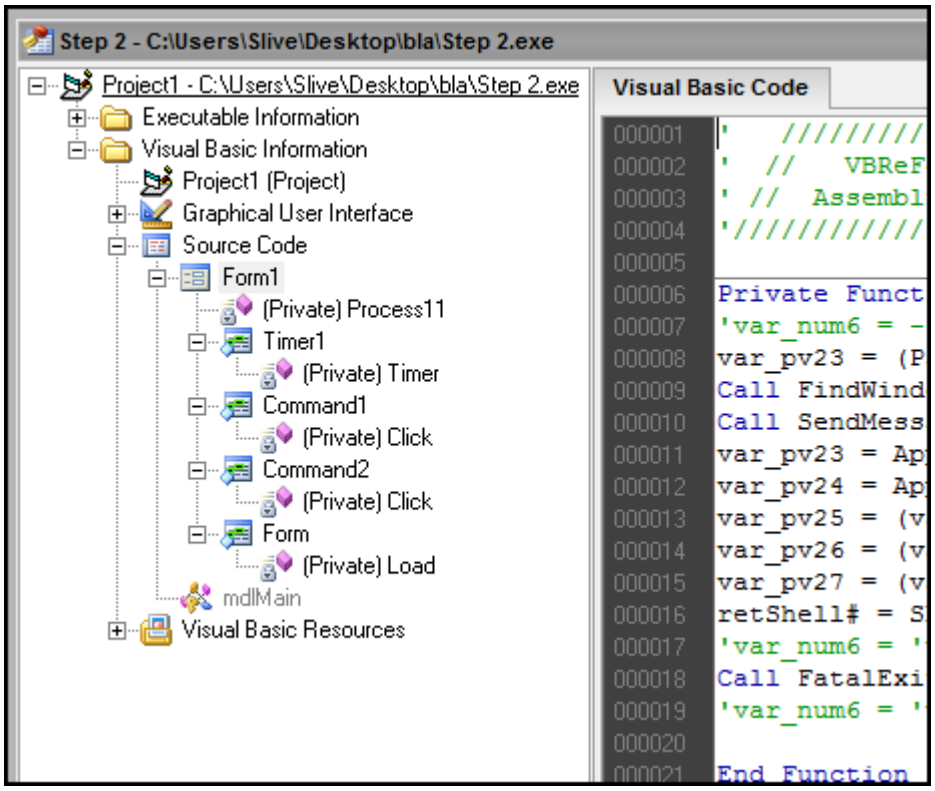
I will show you, step by step, how it's simple to solve the yudi's Step 2 using VBReFormer Professional.

- Running the application:



We can see that a serial is generated using the name of the user.
How the serial is generated? See the following step.

- Now we just open the "Step 2.exe" file with VBReFormer Professional and getting the following result:

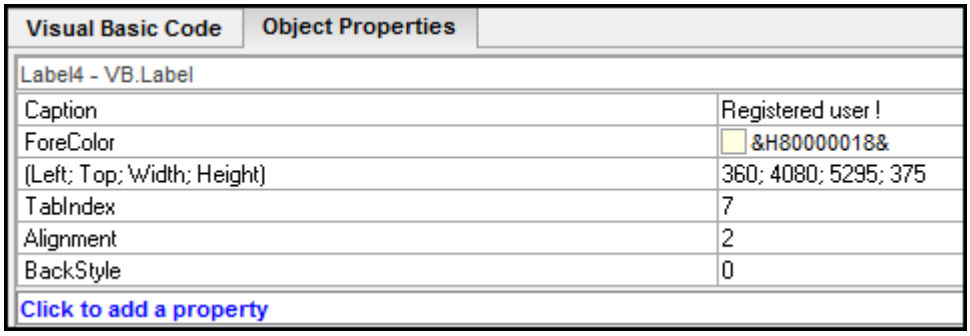


- We will now take a look to the first method loaded on Visual Basic application.

```
000156 Private Sub Form_Load
000157 'var_num6 = -52 - 12 - 20
000158 Set var_pv23 = Me.Label4()
000159 var_pv23.Visible() = False
000160 Set var_pv23 = Me.Timer1()
000161 var_pv23.Interval() = 1000
000162
000163 End Sub
```

We can see on this capture that the “Label4” visibility is set to False (not visible) at the beginning of the application.

Take a look to that control in the resource editor of VBReFormer and you will agree that it’s the control that show the message “Registered user!”



We now need to know where the “Label4” control visibility is set to true, and what does the “Timer1” control.

- The analysis of the Timer1 control is interesting but not very useful for the following of this tutorial.

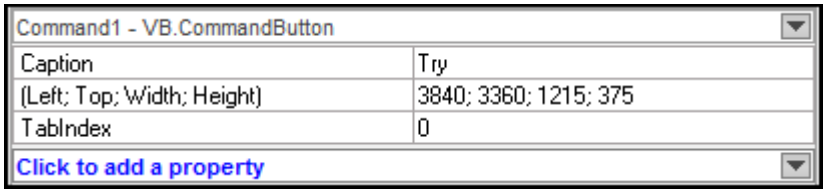
```
000025  Private Sub Timer1_Timer
000026  'var_num6 = -52 - 12 - 20
000027  ' *** API Reference to 'IsDebuggerPresent' From '
000028  Call FatalExit (0)   '{Sub}
000029  var_pv23 = ("OLLYDBG")
000030  var_pv23 = ("#32770")
000031  var_pv23 = ("18467-41")
000032  var_pv23 = ("28387380")
000033  var_pv23 = ("Import REConstructor v1.6 FINAL (C)
000034  Call FindWindowA (-52 - 12, var_pv23)   '{Functior
000035  Call SendMessageA (-4088, 16, 0, -52 - 12)   '{Fur
000036  var_pv23 = ("Resource Hacker")
000037  Call FindWindowA (-52 - 12, var_pv23)   '{Functior
000038  Call SendMessageA (-4092, 16, 0, -52 - 12)   '{Fur
000039  var_pv23 = ("VBExplorer")
000040  Call FindWindowA (-52 - 12, var_pv23)   '{Functior
000041  Call SendMessageA (-4096, 16, 0, -52 - 12)   '{Fur
000042  var_pv23 = ("PVDasm v1.06d Program Disassembler")
000043  Call FindWindowA (-52 - 12, var_pv23)   '{Functior
000044  Call SendMessageA (-4100, 16, 0, -52 - 12)   '{Fur
000045  var_pv23 = ("VBRezQ")
000046  Call FindWindowA (-52 - 12, var_pv23)   '{Functior
000047  Call SendMessageA (-4104, 16, 0, -52 - 12)   '{Fur
000048  var_pv23 = ("URSoft W32Dasm Ver 8.93 Program Disa
000049  Call FindWindowA (-52 - 12, var_pv23)   '{Functior
000050  Call SendMessageA (-4108, 16, 0, -52 - 12)   '{Fur
000051
000052  End Sub
```

We can see here that the “Timer1_Timer” function is called every second by “Timer1” control in order to check that no debuggers, and if one is running, to close it.

We can note that it also close any MessageBox windows.

- Now we are looking for the code under the “Try” button which check if the key match with the name.

That “Try” button is the “Command1” button in VBReFormer:



Then just look to the Command1_Click() function in order to see the algorithm of key checking:

```
000056  Private Sub Command1_Click
000057  Set var_pv2 = Me.Label4()
000058  var_pv2.Visible() = False
000059  Set var_pv2 = Me.Text1()
000060  var_pv3 = var_pv2.Text()
000061  Set var_pv4 = Me.Text1()
000062  var_pv5 = var_pv4.Text()
000063  var_num8 = ((var_pv3) = ("")) Or ((var_pv5) = (" "))
000064  'var_num6 = -52 - 24 + 12
000065  'var_num6 = 'var_num6 + 12
000066  If (var_num8) Then
000067
000068  var_pv6 = ("Hey")
000069  var_pv7 = ("need something")
000070  var_pv8 = MsgBox(var_pv7, 4160, var_pv6)
000071  End If
000072  'var_num6 = 'var_num6 + 20
000073  Set var_pv2 = Me.Text2()
000074  var_pv3 = var_pv2.Text()
000075  Set var_pv4 = Me.Text2()
000076  var_pv5 = var_pv4.Text()
000077  var_num8 = ((var_pv3) = ("")) Or ((var_pv5) = (" "))
000078  'var_num6 = 'var_num6 + 12
000079  'var_num6 = 'var_num6 + 12
000080  If (var_num8) Then
000081
000082  var_pv6 = ("Hey")
000083  var_pv7 = ("need something")
000084  var_pv9 = MsgBox(var_pv7, 4160, var_pv6)
000085  End If
000086  'var_num6 = 'var_num6 + 20
000087  Set var_pv2 = Me.Text1()
000088  var_pv3 = var_pv2.Text()
000089  var_pv10 = (var_pv3)
000090  var_pv11 = (Date$) & (" ")
000091  var_pv12 = (var_pv11) & (Time$)
000092  var_pv13 = (var_pv12)
000093  'var_num6 = 'var_num6 + 16
000094  var_pv12 = Len(var_pv13)
```

```
000095  For var_pv14 = 1 To Len(var_pv13) Step 1
000096  'var_num6 = 'var_num6 + 12
000097  If (IsNumeric(Mid$(var_pv13, CLng(var_pv14), 1))) Then
000098
000099  var_pv15 = (Asc(Mid$(var_pv13, CLng(var_pv14), 1)))
000100  'var_num6 = 'var_num6 + 12
000101  If (((var_pv14) <= (Len(var_pv10)))) Then
000102
000103  var_pv16 = (Str(Asc(Mid$(var_pv10, CLng(var_pv14), 1))))
000104  'var_num6 = 'var_num6 + 12
000105  'var_num6 = 'var_num6 + 12
000106  var_pv16 = (Right$(var_pv16, 1))
000107  'var_pv17 = (00)
000108  var_pv16 = (Val(var_pv16))
000109  End If
000110
000111  var_pv18 = ((var_pv18 & Chr$(CLng(((var_pv15 + 17) + var_pv16)))))
000112  'var_num6 = 'var_num6 + 16
000113  var_pv18 = ((var_pv18 & Chr$(CLng(((var_pv15 + 17) + (var_pv16 * 2))))))
000114  End If
000115  'var_num6 = 'var_num6 + 16
000116  Next var_pv14
000117  For var_pv14 = 1 To 24 Step 4
000118  var_pv19 = (((var_pv19 & Mid$(var_pv18, CLng(var_pv14), 4)) & "-"))
000119  'var_num6 = 'var_num6 + 16
000120  Next var_pv14
000121  var_pv20 = ((Len(var_pv19) - 1))
000122  var_pv19 = (Mid$(var_pv19, 1, var_pv20))
000123  Set var_pv2 = Me.Text2()
000124  var_pv3 = var_pv2.Text()
000125  var_pv21 = (var_pv3)
000126  var_pv22 = ((var_pv19 Like var_pv21))
000127  If (((var_pv22) = (True))) Then
000128
000129  Set var_pv2 = Me.Label4()
000130  var_pv2.Visible() = True
000131  End If
000132
000133  Set var_pv2 = Me.Text1()
000134  var_pv2.Text() = ""
000135  Set var_pv2 = Me.Text2()
000136  var_pv2.Text() = ""
000137  Set var_pv2 = Me.Text1()
000138  Call var_pv2.SetFocus()
000139  'var_num6 = 'var_num6 + 16
000140  'var_num6 = 'var_num6 + 12
000141  'var_num6 = 'var_num6 + 24
000142  'var_num6 = 'var_num6 + 20
000143
000144  End Sub
```

The algorithm seems a little complicated for newbie, but complete and without any syntax and source code error from VBReFormer.

That's a great thing for us; we will be able to test the application into the Visual Basic IDE later (to make a key generator for example).

By analyzing the code we can see the following:

```
Set var_pv2 = Me.Text1()
var_pv3 = var_pv2.Text()
var_pv10 = (var_pv3)
var_pv11 = (Date$) & (" ")
var_pv12 = (var_pv11) & (Time$)
var_pv13 = (var_pv12)
```

This part of code is showing us that the key is generated from the Name, but also with the Date and the Time !

That's meaning it's almost impossible to generate a key that does not expire the following second.

- In order to made the Key Generator, save the project with VBReFormer, and open it with Visual Basic 6.
  When it's opened into the Visual Basic IDE, remove the debugger watching functions and just keep the following:
  - Command1_Click
  - Command2_Click

  Now remove the following block conditions from Command1_Click function:

```
If (var_num8) Then
var_pv6 = ("Hey")
var_pv7 = ("need something")
var_pv8 = MsgBox(var_pv7, 4160, var_pv6)
End If

If (var_num8) Then
var_pv6 = ("Hey")
var_pv7 = ("need something")
var_pv9 = MsgBox(var_pv7, 4160, var_pv6)
End If
```

  These block are showing an alert when the "Name" field and when the "Key" field are empty, but it's not usefull for a keygen.

  At the end of the Command1_Click function we can see the serial check condition:

```
Set var_pv2 = Me.Text2()
var_pv3 = var_pv2.Text()
var_pv21 = (var_pv3)
var_pv22 = ((var_pv19 Like var_pv21))
If (((var_pv22) = (True))) Then

Set var_pv2 = Me.Label4()
var_pv2.Visible() = True
End If
```

  That code is checking that the serial (stored in var_pv19 variable) generated from the name with the algorithm is the same than the one entered in the "Serial" field (Text2.Text).

To show the generated serial, we just need to replace that condition block by the following line of code:

```
For var_pv14 = 1 To 24 Step 4
var_pv19 = (((var_pv19 & Mid$(var_pv18,
'var_num6 = 'var_num6 + 16
Next var_pv14
var_pv20 = ((Len(var_pv19) - 1))
var_pv19 = (Mid$(var_pv19, 1, var_pv20))

Text2.Text = var_pv19
```

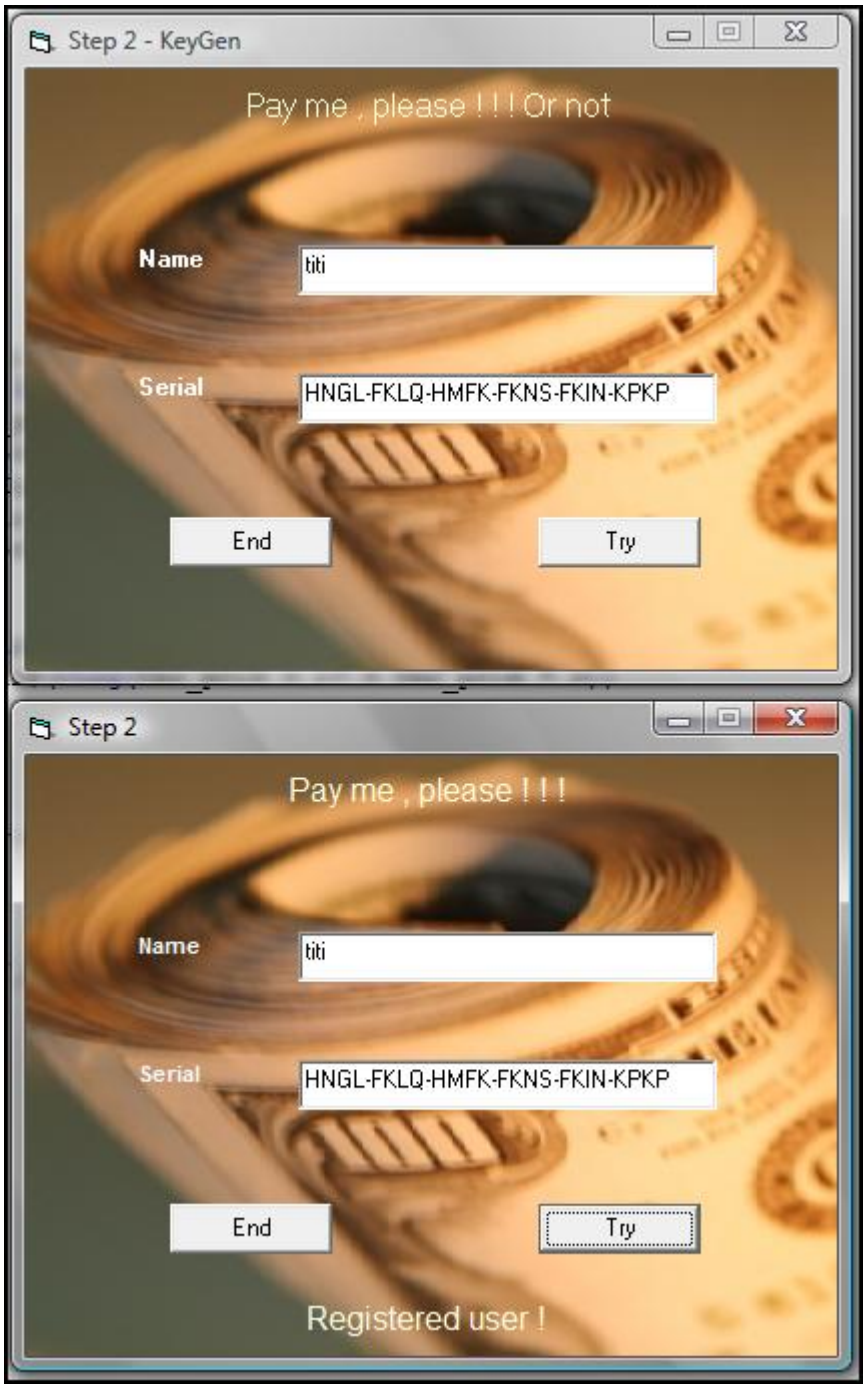
You must also remove the following line of code which remove the content of the both fields:

```
Set var_pv2 = Me.Text1()
var_pv2.Text() = ""
Set var_pv2 = Me.Text2()
var_pv2.Text() = ""
Set var_pv2 = Me.Text1()
```

After all change and simplifications, we have the following keygen code:

```
Private Sub Command1_Click()
    var_pv10 = Text1.Text
    var_pv13 = Date$ & " " & Time$

    For var_pv14 = 1 To Len(var_pv13) Step 1
        If IsNumeric(Mid$(var_pv13, CLng(var_pv14), 1)) Then
            var_pv15 = Asc(Mid$(var_pv13, CLng(var_pv14), 1))
            If var_pv14 <= Len(var_pv10) Then
                var_pv16 = Str(Asc(Mid$(var_pv10, CLng(var_pv14), 1)))
                var_pv16 = Right$(var_pv16, 1)
                var_pv16 = Val(var_pv16)
            End If

            var_pv18 = var_pv18 & Chr$(CLng(var_pv15 + 17 + var_pv16))
            var_pv18 = var_pv18 & Chr$(CLng(var_pv15 + 17 + var_pv16 * 2))
        End If
    Next var_pv14

    For var_pv14 = 1 To 24 Step 4
        var_pv19 = var_pv19 & Mid$(var_pv18, CLng(var_pv14), 4) & "-"
    Next var_pv14

    var_pv20 = Len(var_pv19) - 1
    var_pv19 = Mid$(var_pv19, 1, var_pv20)

    Text2.Text = var_pv19
End Sub
```

- We now have to test our keygen:

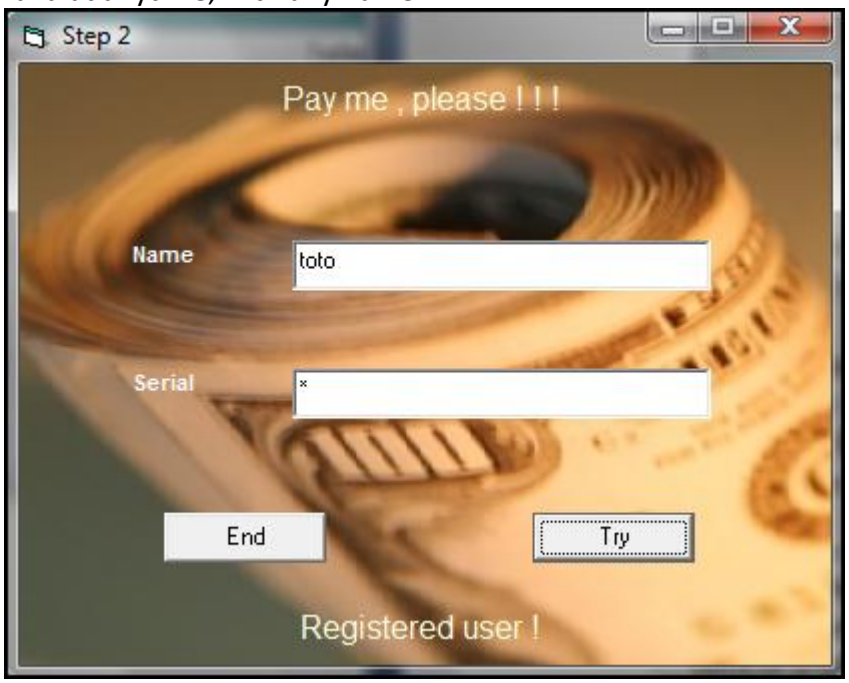


- The first window is the windows of our KeyGen created from the original crackme, and the second window is the one of the original Crackme, with the key from the KeyGen.

  The result is that our keygen work perfectly!
  Just note that the use of date and time make your key valid for only 1 minute after having generated it.

  Is it possible to bypass that limitation?
  Yes it is ! In fact, to get the “Registered user!” message you even don’t need a key generator. By reading the code you can see that the operator used to perform a comparison between the both string key is the “Like” operator.

The “like” operator allows to comparate a string and a pattern…
Then you just can set “*” into the serial field and you will have a key which will be valid at anytime, with any name:



Source code of the key generator can be downloaded here:
http://www.decompiler-vb.net/documentation/crackmes/step_2.zip

Enjoy it !

Sylvain Bruyere
http://www.decompiler-vb.net