

Objectives

Program Purpose

- Display a short series in a list box
- Clear the display
- Adjust the series maximum

Learning Goals

- To demonstrate the difference between definite and indefinite loops
- To demonstrate how much more code is needed when not using a loop to carry out repetitive instructions
- To use 'Constants' to hold larger values for labels
- To use 'Form_Load' to initialise label captions

Design Notes

This program example has no intrinsic purpose other than to demonstrate the difference between definite and indefinite loops.

The top label in the interface displays information for the user. 'Constants' are used to hold the text displayed in this label. The label is initialised in the 'Form_Load' event.

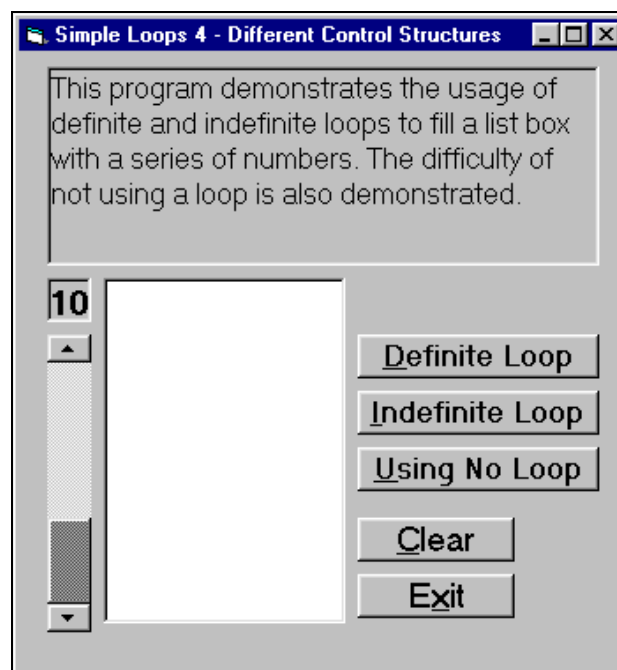
Constants are a good way to organise fixed values (either text string or numeric). The data can then easily be changed within the general section of the program, rather than having to edit the code.

The loop construct '**WHILE...WEND**' is introduced here. This is used when the program designer doesn't know beforehand how many times the loop will need to be executed.

Interface

Create the interface as shown below.

Use 5 command buttons, 1 vertical scroll bar, 2 labels and 1 list box.



Names of Objects

| Type of Object | Number | Names of Objects | Simple Initial Properties of Objects |
|----------------------|--------|--|--|
| Form | 1 | Form1 | Caption – "Simple Loops 4" |
| List Box | 1 | lstDisplay | Font – Bold, 12 |
| Vertical Scroll Bars | 1 | vsbMaxNum | |
| Labels | 2 | lblNum, lblInfo | Font – Bold, 12 Borderstyle – Single Captions – "" |
| Command Buttons | 5 | cmdDisplayFixedLoop, cmdDisplayIndefiniteLoop, cmdDisplayNoLoop, cmdClear, cmdExit | Font – Bold, 12: Captions – As per Interface |

Further Initial Properties of Objects

| Object | Property | Initial Value |
|------------|------------------|-------------------|
| Form1 | Startup Position | 2 – Center Screen |
| | | |
| vsbMaxNum | Min | 1 |
| | Max | 10 |
| | Value | 10 |
| | LargeChange | 2 |
| | | |
| lstDisplay | Columns | 3 |

Events – Code

```
Dim i As Integer          'used for looping around & storing values
Const msgInfo1 = "This program demonstrates the usage of definite and indefinite loops to fill a list box with a series of numbers. "
Const msgInfo2 = "The difficulty of not using a loop is also demonstrated. "
```

Private Sub cmdDisplayFixedLoop_Click()

'displays the numbers from 1 up to the number displayed in the label (method 1)

```
lstDisplay.Clear
```

```
For i = 1 To lblNum.Caption
    lstDisplay.AddItem i
Next i
```

End Sub

Private Sub cmdDisplayIndefiniteLoop_Click()

'displays the numbers from 1 up to the number displayed in the label (method 2)

```
lstDisplay.Clear
```

```
i = 1
While i <= lblNum.Caption
    lstDisplay.AddItem i
    i = i + 1
Wend
```

End Sub

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Events – Code (continued)

```
Private Sub cmdDisplayNoLoop_Click()  
' displays the numbers from 1 up to the number  
' displayed in the label (method 3)  
  
lstDisplay.Clear  
  
If lblNum.Caption >= 1 Then lstDisplay.AddItem 1  
If lblNum.Caption >= 2 Then lstDisplay.AddItem 2  
If lblNum.Caption >= 3 Then lstDisplay.AddItem 3  
If lblNum.Caption >= 4 Then lstDisplay.AddItem 4  
If lblNum.Caption >= 5 Then lstDisplay.AddItem 5  
If lblNum.Caption >= 6 Then lstDisplay.AddItem 6  
If lblNum.Caption >= 7 Then lstDisplay.AddItem 7  
If lblNum.Caption >= 8 Then lstDisplay.AddItem 8  
If lblNum.Caption >= 9 Then lstDisplay.AddItem 9  
If lblNum.Caption >= 10 Then lstDisplay.AddItem 10  
  
' and so on  
  
End Sub  
  
Private Sub cmdClear_Click()  
  
lstDisplay.Clear  
  
End Sub
```

```
Private Sub cmdExit_Click()  
  
End  
  
End Sub  
  
Private Sub Form_Load()  
  
lblNum = vsbNum  
lblInfo = msgInfo1 + msgInfo2  
  
End Sub  
  
Private Sub vsbNum_Change()  
  
lblNum = vsbNum  
  
End Sub
```

Further Notes about Indefinite Loops

When using indefinite loops, it is very easy to create an infinite loop accidentally. An infinite loop occurs when the loop condition is never false. The loop therefore continues indefinitely, using up system resources and eventually crashing the system.

In the 'cmdDisplayIndefiniteLoop_Click' event, the line '***i=i+1***' is critical. Investigate what happens when you remove the line (*tip: if needed, press CTRL + BREAK to stop the program running*). Can you explain the effect that removing this line has?

Another potential problem occurs in the line:

While i <= lblNum.caption

If the '<=' operator is changed to a '>', then the loop will never execute. If the variables ***i*** and ***lblNum.caption*** are interchanged or set incorrectly, problems can also arise.

Suggestions for Consolidation and Extension

1. Modify the constants used to hold the information for the label 'lblInfo'. Add a third constant named 'msgInfo3' and use it in another label.
2. Change the maximum value of the scroll bar to 100. Modify the code in the 'DisplayNoLoop' event to display up to 100 items in the list box. Do you understand why a loop is such an efficient method of coding?