Objectives

**Program Purpose**

- Display a variety of number series in a list box
- Adjust the series maximum
- Clear the display

**Learning Goals**

- To continue practice with FOR-NEXT loops
- To use a listbox rather than a picture box as a way of displaying a list
- To dynamically change command button captions
- To create and use a block of code (a module or procedure) outside of an event

Design Notes

Situations frequently arise when a section of code is needed many times within one program. Rather than wasting time retyping the code (and possibly introducing more errors) programmers write a procedure once, test it, then run it at any time using the ‘Call’ function. In this project, the code is typed in the ‘General’ section of the form. In practice, the frequently used code is often placed in a module and saved as a separate file (e.g. Code1.bas). The function is ‘called’ by simply typing its name in the code.

A module is used for the first time in ‘Program Example 14 – Moving Buttons 2’.

Interface

Create the interface as shown below.
Use 8 command buttons, 1 vertical scroll bar, 1 label and 1 list box.
Names of Objects

<table>
<thead>
<tr>
<th>Type of Object</th>
<th>Number</th>
<th>Names of Objects</th>
<th>Simple Initial Properties of Objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>1</td>
<td>Form1</td>
<td>Caption – “Simple Loops 1”</td>
</tr>
<tr>
<td>List Box</td>
<td>1</td>
<td>lstDisplay</td>
<td>Font – Bold, 12</td>
</tr>
<tr>
<td>Vertical Scroll Bar</td>
<td>1</td>
<td>vsbMaxNum</td>
<td></td>
</tr>
<tr>
<td>Label</td>
<td>1</td>
<td>lblMaxNum</td>
<td>Font – Bold, 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BorderStyle – None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BackStyle – Transparent</td>
</tr>
<tr>
<td>Command Button</td>
<td>8</td>
<td>cmdDisplay1ToMax,</td>
<td>Font – Bold, 12: Captions – As Shown on interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cmdDisplayMaxTo1,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cmdEvens,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cmdMultiples3,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cmdOdds,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cmdSquares,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cmdClear,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cmdExit</td>
<td></td>
</tr>
</tbody>
</table>

Further Initial Properties of Objects

<table>
<thead>
<tr>
<th>Object</th>
<th>Property</th>
<th>Initial Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form1</td>
<td>Startup Position</td>
<td>2 – Center Screen</td>
</tr>
<tr>
<td>LstDisplay</td>
<td>Columns</td>
<td>4</td>
</tr>
<tr>
<td>VsbMaxNum</td>
<td>Min</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>LargeChange</td>
<td>5</td>
</tr>
</tbody>
</table>

Events – Code

```vbnet
Private Sub cmdClear_Click()
    lstDisplay.Clear
End Sub

Private Sub cmdDisplay1ToMax_Click()
    Dim i As Integer
    lstDisplay.Clear
    For i = 1 To vsbMaxNum.Value
        lstDisplay.AddItem i
    Next i
End Sub

Private Sub cmdDisplayMaxTo1_Click()
    Dim i As Integer
    lstDisplay.Clear
    For i = vsbMaxNum.Value To 1 Step -1
        lstDisplay.AddItem i
    Next i
End Sub

Private Sub cmdEvens_Click()
    Dim i As Integer
    lstDisplay.Clear
    For i = 2 To vsbMaxNum.Value Step 2
        lstDisplay.AddItem i
    Next i
End Sub

Private Sub cmdExit_Click()
    End
End Sub
```
Private Sub cmdMultiples3_Click()
    Dim i As Integer
    lstDisplay.Clear
    For i = 3 To vsbMaxNum.Value Step 3
        lstDisplay.AddItem i
    Next i
End Sub

Private Sub cmdOdds_Click()
    Dim i As Integer
    lstDisplay.Clear
    For i = 1 To vsbMaxNum.Value Step 2
        lstDisplay.AddItem i
    Next i
End Sub

Private Sub cmdSquares_Click()
    Dim i As Integer
    lstDisplay.Clear
    For i = 1 To vsbMaxNum.Value
        lstDisplay.AddItem i ^ 2
    Next i
End Sub

Private Sub Form_Load()
    SetCaptions
End Sub

Private Sub vsbMaxNum_Change()
    SetCaptions
End Sub

Sub SetCaptions()
    lblMaxNum.Caption = vsbMaxNum.Value
    'change command button captions to reflect maximum value
    cmdSquares.Caption = "The first " & vsbMaxNum.Value & " Square Numbers"
    cmdMultiples3.Caption = "Multiples of 3 up until " & vsbMaxNum.Value
    cmdEven3.Caption = "Even numbers up until " & vsbMaxNum.Value
    cmdDisplayMaxTo1.Caption = "Numbers from " & vsbMaxNum.Value & " down to 1"
    cmdDisplay1ToMax.Caption = "Numbers from 1 up to " & vsbMaxNum.Value

    If vsbMaxNum.Value Mod 2 = 0 Then  'max value is even
        cmdOdds.Caption = "Odd numbers up until " & vsbMaxNum.Value - 1
    Else
        cmdOdds.Caption = "Odd numbers up until " & vsbMaxNum.Value
    End If
End Sub