

Program Example 18 Variable Arrays 2

Objectives

Program Purpose

- To generate a random pattern of colours, store the pattern and recall it.
- To alter the shape style of the pattern, store and recall the shapes.

Learning Goals

- Further use of Control and Variable Arrays
- Understanding of various shape properties
- Use of the Wait procedure for visual effect and troubleshooting

Design Notes

This project further demonstrates how control arrays and variable arrays can be used together.

Set the properties for one label, then copy and paste it. When pasting, create a control array.

It is very important to have the frame selected when pasting the shapes for the control arrays. Without selecting the frame, the pasted shape is not linked to it (if this occurs, simply delete the object, select the frame and paste the object again).

Multiple controls can be selected by holding down SHIFT key as they are clicked. This will enable you to copy and paste the whole row together. Always check the index numbers of each object after they have been copied. The order may not turn out as you would expect.

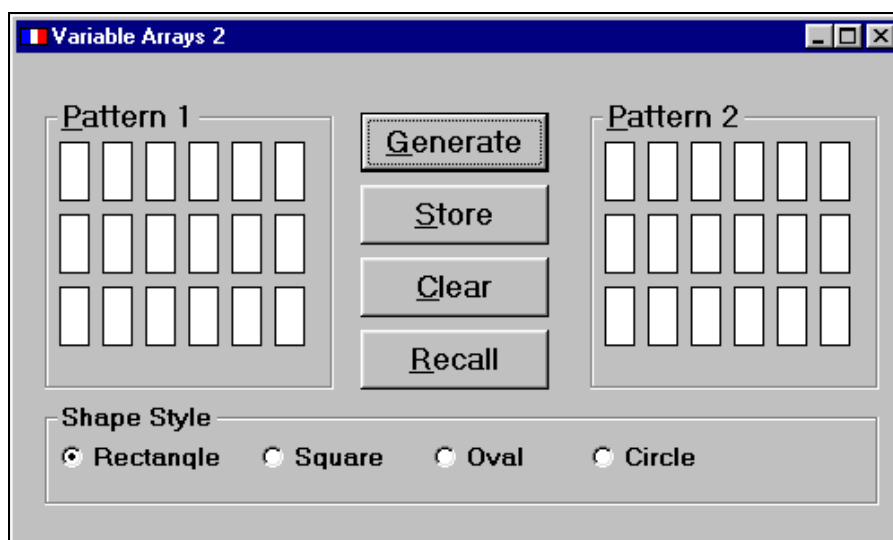
Always set the name properties before entering any code. Labels that serve no other purpose than displaying text do not need particular names. The default names *Label1, Label2 etc.* are sufficient.

Interface

Create the interface as shown.

Use 1 form, 2 separate frames each with a separate control array of 18 shapes, 4 command buttons and a 3rd frame with a control array of 4 option buttons.

It is necessary to match the shape property of the shape with the index value of each option button. Shape value 0 = rectangle; value 1 = square, value 2 = oval and value 3 = circle.



Names of Objects

Type of Object	Number	Names of Objects	Simple Initial Properties of Objects
Form	1	Form1	Caption - "Variable Arrays 2" Icon - Browse and choose any icon Startup Position - Centre Screen
Frames	3	No name necessary	Captions - pattern1, pattern 2, shape style Font - Bold, 12
Control arrays of 18 shapes	2	shpP1(0) to shpP1(17) shpP2(0) to shpP2(17)	BackStyle - Opaque BackColor - White Shape - 0 (Rectangle)
Control array of option buttons	1	optStyle(0) to optStyle(3)	Labels - as per interface OptStyle(1) Value - True
Command Buttons	4	cmdGenerate, cmdStore, cmdRecall, cmdClear	Font - Bold, 12 Captions - as per interface

Code

GENERAL SECTION

```
Dim z As Integer           'loop variable
Const NumCells = 18       'Number of Shapes in Linear Pattern
```

```
Dim Pattern1(NumCells - 1) As Long
Dim ShapePattern1(NumCells - 1) As Integer
Dim ShapeStyle As Integer
```

Sub Wait(x As Single)

```
Dim start As Single

start = Timer
While start + x > Timer
    DoEvents
Wend
```

End Sub

EVENTS

Private Sub cmdGenerate_Click()

```
Randomize
For z = 0 To NumCells - 1
    shpP1(z).BackColor = RGB(Rnd * 255, Rnd * 255, Rnd * 255)

    shpP1(z).Shape = Int(Rnd() * 4) 'between 0 and 3
    Wait 0.1                       'for effect
Next z
```

End Sub

Private Sub cmdRecall_Click()

```
For z = 0 To NumCells - 1
    shpP2(z).BackColor = Pattern1(z)
    shpP2(z).Shape = ShapePattern1(z)
Next z
```

End Sub

Private Sub cmdClear_Click()

```
For z = 0 To NumCells - 1

    shpP1(z).BackColor = vbWhite
    shpP2(z).BackColor = vbWhite
    shpP1(z).shape = 0
    shpP2(z).shape = 0

Next z
```

End Sub**Private Sub cmdStore_Click()**

```
For z = 0 To NumCells - 1
    Pattern1(z) = shpP1(z).BackColor
    ShapePattern1(z) = shpP1(z).Shape
Next z
```

End Sub**Private Sub optStyle_Click(Index As Integer)**

```
ShapeStyle = Index

For z = 0 To NumCells - 1
    shpP1(z).Shape = ShapeStyle
Next z
```

End Sub**Consolidation and Extension**

1. Which lines of code reset the shapes to rectangles?
2. Write code that resets the shapes to circles.
3. Name of the variable array that is storing the shape information about Pattern1?
4. How could we randomly generate the Border Style and Border Width property of the patterns?
5. What does each of the following lines do?

```
shpP1(z).BorderStyle = Int(Rnd() * 6) + 1
```

```
shpP1(z).BorderWidth = Int(Rnd() * 8) + 1
```

6. Which section of code slows down the running of the program?
7. 'x as single' is a parameter variable declaration. How is this different to the other declarations?
8. a. Modify the Frame containing the Shape Style option buttons so that it includes the rounded square and rounded rectangle.
b. Modify the code accordingly to activate the new buttons.
9. What other properties of the shapes could be randomly generated, stored and recalled?
10. Name some other applications of control arrays.