Year 12 : Visual Basic Tutorial.

STUDY THIS

Arrays.

An array is a list of data items.

All the data items must be of the same data type.

Arrays must be declared before you use them….

Example :

```
Dim PartyList(3) of String
```

This would declare an array of 4 strings called PartyList. Each string in the array is identified by a subscript. The subscripts in this example go from 0 to 3…

Refer to each string as PartyList(0), PartyList(1), PartyList(2) and PartyList(3).

If you want the subscripts to start from a number other than 0, then declare the first and last subscript…

```
Dim PartyList(1 to 5) of String
```

…would allow the 5 strings PartyList(1), PartyList(2),…, PartyList(5)

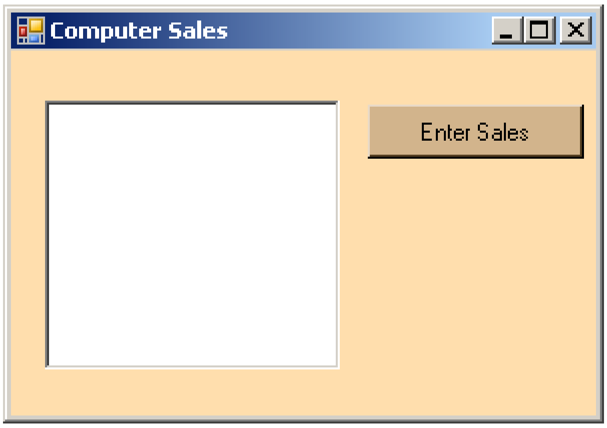
For global arrays use the declaration…

```
Public PartyList(1 to 5) of String
```

HANDS ON

[1] Create a new Windows Application. You are going to create a program that allows a computer salesman to enter the value of sales for each day of the week, and output the value on the best day.

Place a Button (btnEnter) and Listbox (lstTemps) on the form.



[2] Enter the array declaration…(directly after the Public Class Form1 declaration)

```
Public Class Form1

    Dim Sales(4) As Single
```

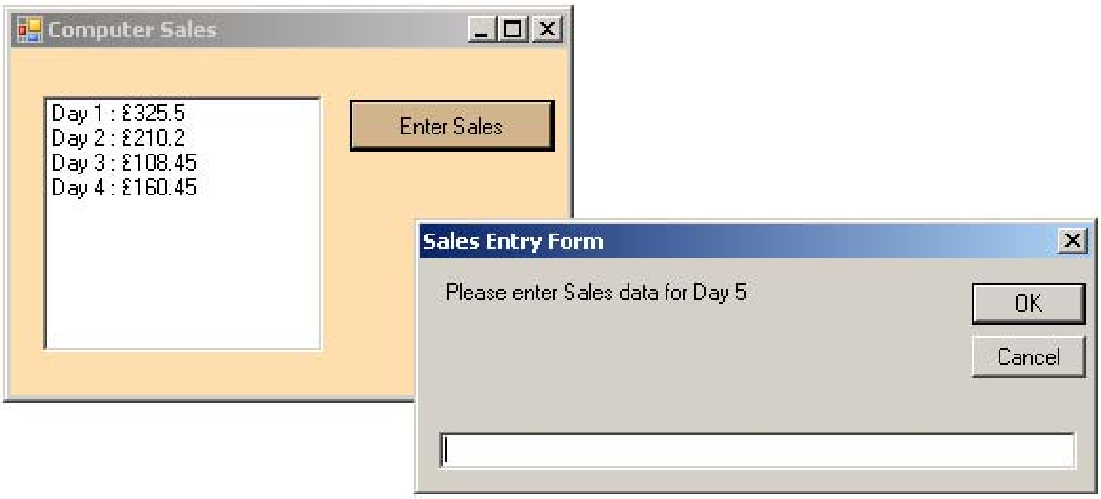
This is placed here so that we can use the array in any of the subroutines in the form.

[3] On the Click event of the Button, enter the following event handler…

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles btnEnter.Click
   Dim i As Integer
   Dim SaleData As Single

   For i = 0 To 4
       'Enter Sales data
       SaleData = InputBox("Please enter Sales data for Day "  &
(i + 1), "Sales Entry Form")
       Sales(i) = SaleData

       'Add Data to ListBox
       lstSales.Items.Add("Day " & (i + 1) & " : £" & Sales(i))
   Next
End Sub
```

Note that the subscripts for the array are 0 to 4, but the user sees them in the display as 1 to 5.

Run the program and you should be able to enter five sales amounts:



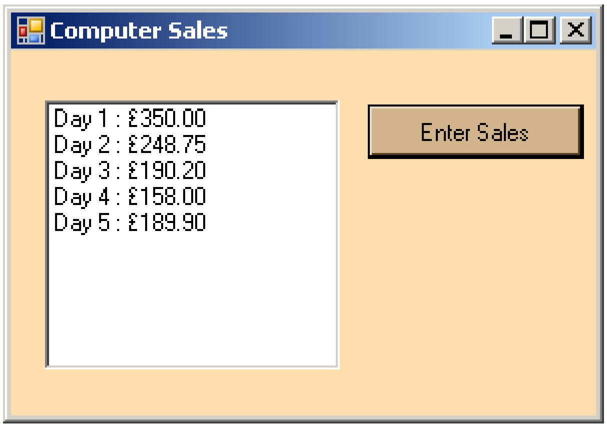
```
Day 1 : £325.5
Day 2 : £210.2
Day 3 : £108.45
Day 4 : £160.45
```

Please enter Sales data for Day 5

[4] The currency amounts in the ListBox do not show the pence to 2 decimal places. To format the numbers, use the FormatCurrency method…

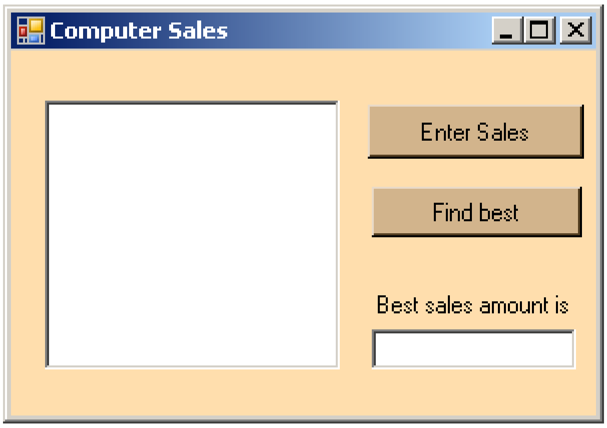
```
'Add Data to ListBox
lstSales.Items.Add("Day " & i + 1 & " : " & FormatCurrency(Sales(i), 2))
```

Run the program again and enter five sales amounts…



Day 1 : £350.00
Day 2 : £248.75
Day 3 : £190.20
Day 4 : £158.00
Day 5 : £189.90

[5] To find the largest sales amount of the week, we need to another Button (btnCalculate), a TextBox (txtBest) and a Label.

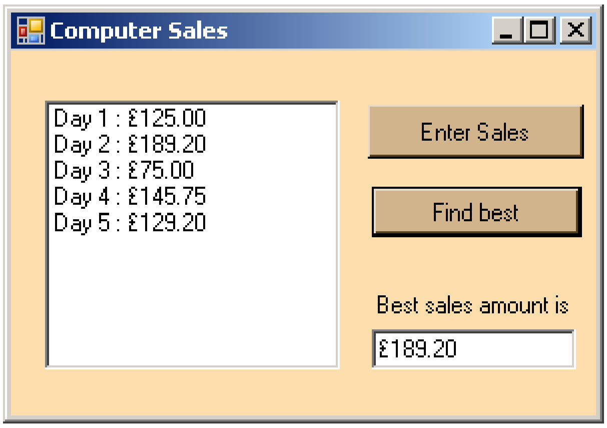


On the Click event of btnCalculate…

```
Private Sub btnCalculate_Click(ByVal sender As System.Object,
ByVal e As System.EventArgs) Handles btnCalculate.Click
        Dim i As Integer
        Dim Largest As Single

        'Initialise to 0
        Largest = 0

        'Check each sales amount for largest so far
        For i = 0 To 4
            If Sales(i) > Largest Then
                Largest = Sales(i)
            End If
        Next

        'Display largest sales amount
        txtBest.Text = FormatCurrency(Largest, 2)

End Sub
```

This is the standard algorithm for finding the largest number in an array. The variable 'Largest' stores the largest so far…as each number is checked in turn.

[5] Run the program and enter five sales amounts…



```
Day 1 : £125.00
Day 2 : £189.20
Day 3 : £75.00
Day 4 : £145.75
Day 5 : £129.20
```

Best sales amount is £189.20

[6] Run several test runs.

Save the Application – you need it in the next set of Challenges.

An Array is a really useful data structure that has a number of built-in methods already.

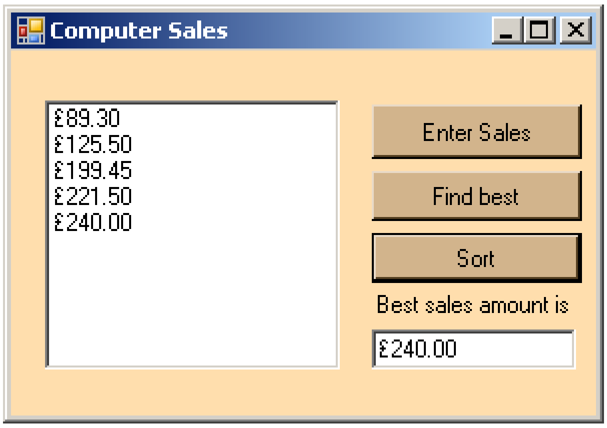
For example, you can sort an array into order…

```
Array.Sort(Sales)
```

Other methods you may wish to investigate include Array.Find, Array.Reverse, Array. Copy and Array.Clear

Visual Basic Challenges 7

[1] Extend the previous application to produce a sorted list of the Sales amounts as shown below…



```
£89.30
£125.50
£199.45
£221.50
£240.00
```

Best sales amount is £240.00

[2] Write a program that stores an array of 5 items and an array that stores their 5 prices. Use the code below in the **Form1_Load** event for setting up the arrays of data.

```
         Item(0) = "T-Shirt"
         Item(1) = "Pencil case"
         Item(2) = "Ruler"
         Item(3) = "Paper weight"
         Item(4) = "Folder"

         Price(0) = 7.99
         Price(1) = 2.2
         Price(2) = 1
         Price(3) = 3.99
         Price(4) = 0.4
```

The user should be able to enter the name of an item, and your program should display its price.

If the user enters "**Pencil case**", the price displayed should be **£2.30**

[3] Extend the exercise [2] to allow the user to calculate the bill for the purchase of a number of one of these items, allowing 5% discount.

Test data : 5 Pencil cases should cost **£10.45**

[4] Set up a password entry program that allows the user to enter a name and a password. If the name matches the password then a 'Welcome' message is displayed.

The user is allowed three attempts before the program ends.

HINTS :

Use two arrays – one for the names and the other for the passwords.