Two Dimensional Arrays

Arrays can have multiple dimensions. A common use of multidimensional arrays is to represent tables of values consisting of information arranged in rows and columns.

To identify a particular table element, we must specify two indexes: The first (by convention) identifies the element's row and the second (by convention) identifies the element's column.

Tables or arrays that require two indexes to identify a particular element are called two dimensional arrays. The following statement declares a two-dimensional array (3 by 3) within a procedure.

Dim Avg (3, 3) as Single

Avg (Row, Col.)				
	Avg (0,0)	Avg (0,1)	Avg (0,2)	Avg (0,3)
	Avg (1,0)	Avg (1,1)	Avg (1,2)	Avg (1,3)
	Avg (2,0)	Avg (2,1)	Avg (2,2)	Avg (2,3)
	Avg (3,0)	Avg (3,1)	Avg (3,2)	Avg (3,3)

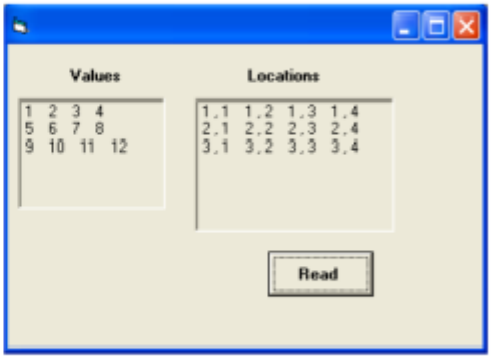
Avg (3, 3)				
	2	6	1	0
	3	1	6	-3
	7	3	1	5
	5	4	-2.5	9

It is also possible to define the lower limits for one or both the dimensions as for fixed size arrays.

Example Write a code program to read of two dimensional array A(3,4) on a row by row. Print the value and position of each element.

Solution:

```
Dim A(3,4) As Single
For I=1 To 3                    (Rows)
For J= 1 To 4                   (Columns)
A(I,J) =Val(InputBox(""))
Next J
Next I
For I=1 To 3
For J= 1 To 4
Picture1.Print A(I, J) ; Space(2) ;
Picture2.Print I ; " , " ;  J ; Space(2) ;
Next  J
```

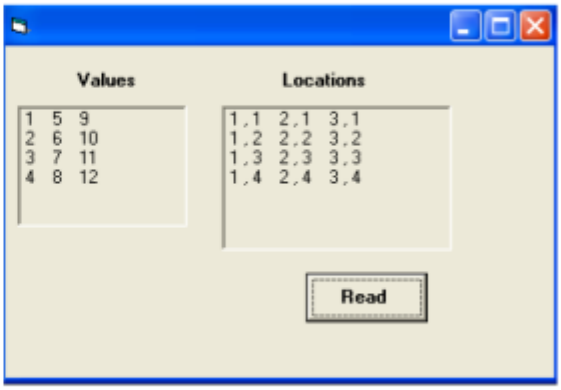


Pictur1.Print: picture2.print
Next I

Example Write a code program to read of two dimensional array A(3,4) on a column by column. Print the value and position of each element.

Solution:

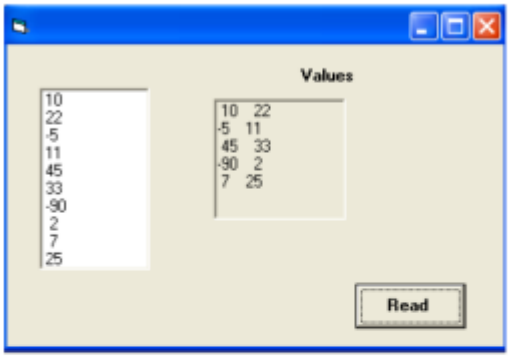
```
Dim A(3,4) As Single
For J=1 To 4                          (Columns)
For I= 1 To 3                         (Rows)
A(I,J) =Val(InputBox(""))
Next I
Next J
For J=1 To 4
For I= 1 To 3
Picture1.Print A(I, J) ; Space(2) ;
Picture2.Print I ; " , " ;  J ; Space(2) ;
Next  I
Picture1.Print :   Picture2.Print
Next  J
```



Example Write a code program to create a two dimensional array N (5X2) into List Box on row by row. Print the values of array N.

Solution:

```
Dim N(5,2) As Single
K=0
For I = 1 To 5
For J=1 To 2
N(I,J)= Val (List1.List (K))
K=K+1
Next J, I
For I=1 To 5
For J= 1 To 2
Picture1.Print N(I, J) ; Space(2) ;
Next  J : Picture1.Print : Next  I
```

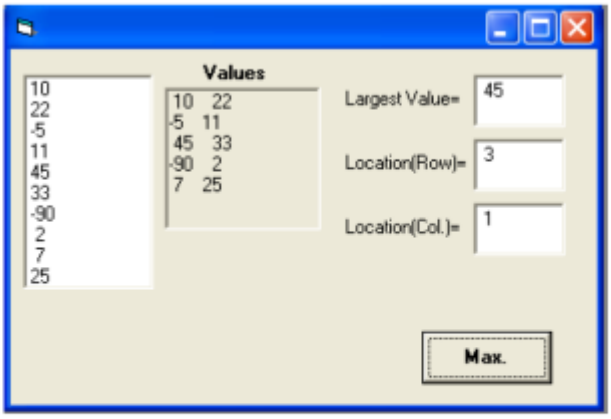


Example Suppose N is a (5x2) matrix array is entered into ListBox on row by row. Write a program segment to find the location I and J such that N (I,J) contains the largest value in N. Print the values of array N. Display the Largest value and the location into textboxes.

Solution:

```
Dim N(5,2) As Single
K=0
For I = 1 To 5
For J=1 To 2
```

```
N(I,J)= Val (List1.List (K))
K=K+1
Next J, I
Max = N(1, 1): R = 1: C = 1
For I = 1 To 5
For J = 1 To 2
If N(I, J) > Max Then
Max = N(I, J)
R = I: C = J
End If
Next  J ,  I
For I = 1 To 5
For J = 1 To 2
Picture1.Print N(I, J); Space(2);
Next J: Picture1.Print: Next I
Text1.Text = Str(Max)
Text2.Text = Str(R)
Text3.Text = Str(C)
```



Example Write a code program to defined the array H (5,5) Calculate the elements of the numeric array (H). Each element of H is determined by the formula ($h_{ij} = i + j - 1$) .Create the one dimensional array X contains the elements of array H(5,5) on row by row. Print the array X into List Box.

Solution:

```
Dim H(5,5) As Single , X(25) As Single
For I=1 To 5
For J=1 To 5
H(I,J)=(I+J-1)
Next J ,I
For I =1 To 5
For J=1 To 5
K=K+1
X(K) =H (I , J)
Next J , I
For I=1 To K
List1.AddItem str(X(I))
Next I
```