4.2 Two-dimensional arrays
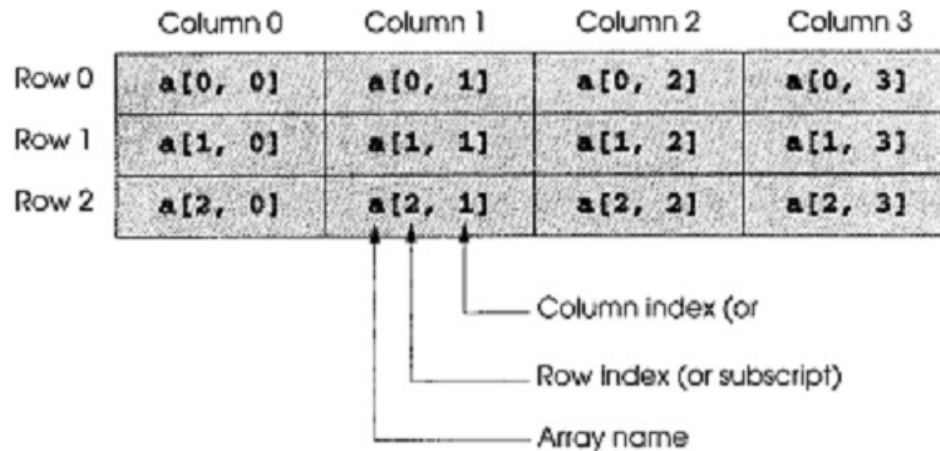
- The following figure illustrates a two-dimensional array, a, containing three rows and four columns.

	Column 0	Column 1	Column 2	Column 3
Row 0	a[0, 0]	a[0, 1]	a[0, 2]	a[0, 3]
Row 1	a[1, 0]	a[1, 1]	a[1, 2]	a[1, 3]
Row 2	a[2, 0]	a[2, 1]	a[2, 2]	a[2, 3]

Column index (or

Row index (or subscript)

Array name

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- To allocate two-dimensional array named "a" which have 10 rows and 5 columns of type int :

  int [,] a = new int [10,5];

  Or

  int [,] a ;

  a= new int [10,5];
- The a array contains 50 (10 x 5) elements.
- We can initialize the two-dimensional array elements using { and } delimiters in the same way as in the single dimensional array.
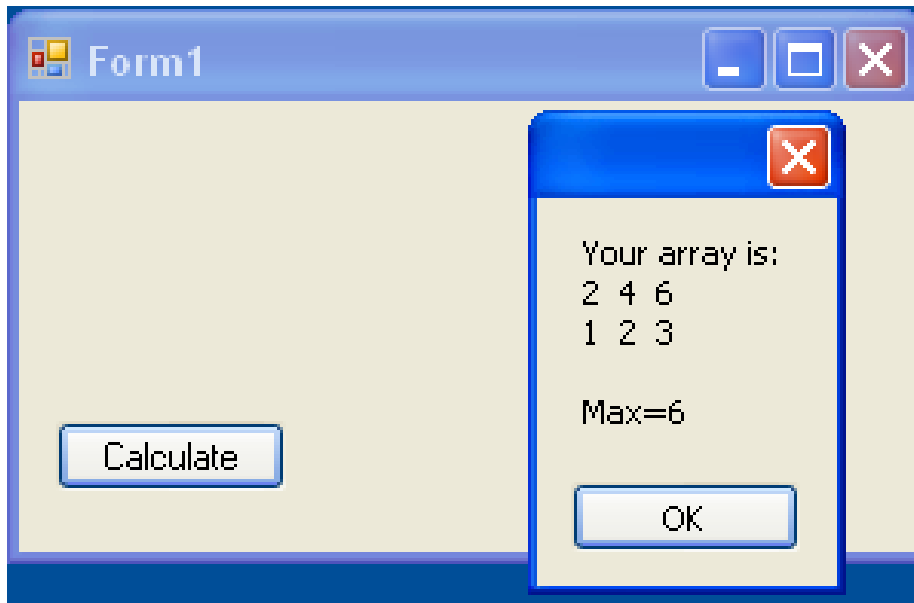
  double [,] B =new double [2,4]{{ 4,8,6,2},{5,1,8,4}};

  or

  double [,] B ={{ 4,8,6,2},{5,1,8,4}};

- For example:

  Write a program to input the array A to the computer memory, culculate its Max value and display this array and its max value.

$$A=\begin{bmatrix} 2 & 4 & 6 \\ 1 & 2 & 3 \end{bmatrix}$$

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```csharp
private void ButCalculate_Click(object sender, EventArgs e)
{
    int[,] A = { { 2, 4, 6 }, {1,2,3 } };
    int Max = A[0,0];
    string s = "Your array is:\n";
    for (int i = 0; i < 2; i++)
    {
        for (int j = 0; j < 3; j++)
        {
            if(A[i,j]>Max) Max=A[i,j];
            s += A[i,j].ToString() + "  ";
        }
        s += "\n";
    }
    s += "\nMax=" + Max.ToString();
    MessageBox.Show(s);
}
```

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