**PRACTICAL # 06**

**OBJECT:**

C# Arrays

**THEORY:**

An array is a collection of variables of the same type, referenced by a common name. In C#, arrays can have one or more dimensions, the one-dimensional array being most common.

Array data can be easily manipulated and easily sorted. Arrays in C# have one special attribute: They are implemented as objects, giving several important advantages are gained, not the least of which is that unused arrays can be garbage-collected.

**Program:**

The following creates an int array of ten elements and links it to an array reference variable named sample.

*int[] sample = new int[10];*

The program below demonstrates a one dimensional array:

*static void Main() {*

*int[] sample = new int[10];*

*for(int i = 0; i < 10; i = i+1)*

*sample[i] = i;*

*for(int i = 0; i < 10; i = i+1)*

*Console.WriteLine("sample[" + i + "]: " + sample[i]);*

*}*

**Multidimensional Arrays**

Arrays can have more than one dimension. The program below declares a table of 10 rows and 20 columns, a 10 \* 20 array:

*int[ , ] table = new int[10, 20];*

The dimensions of a multidimensional array are separated by comma. The program below is a demo of two dimensional array:

*static void Main() {*

*int t, i;*

*int[,] table = new int[3, 4];*

*for(t=0; t < 3; ++t) {*

*for(i=0; i < 4; ++i) {*

*table[t,i] = (t\*4)+i+1;*

*Console.Write(table[t,i] + " ");*

*}*

*Console.WriteLine();*

*}*

*}*

We can similarly create higher dimensional arrays by comma separating the dimensions:

*int [ , , ] threeD = new int [1, 1, 1];*

**Jagged Arrays**

Multidimensional arrays can also be created with jagged array notation.

Jagged arrays are declared by using sets of square brackets to indicate each dimension.

The following declares a two-dimensional jagged array:

*int[][] jaggedArray = new int[3][];*

*jagged[0] = new int[4];*

*jagged[1] = new int[3];*

*jagged[2] = new int[5];*

**ACTIVITIES**

**Activity 1**

Write a program that calculates sum and average of the array elements.

**Activity 2**

Write a program that initializes two matrices (two dimensional arrays) and performs addition of matrices.

**REVIEW QUESTIONS**

1. What is an array?
2. What is array initialization?
3. What is a multi-dimensional array?
4. How are array elements arranged in the memory?
5. What happens if we access 11th element in an array of 10 elements?