ARRAY

What is an Array?

To answer the question "What is an array?", it is best to look back at the question "What is a variable?" A variable is a memory location that is set up to store a particular type of information such as an integer (int) or character (char). That memory location is also associated with a name.

For example the c# statement:

```
int intAge;
```

sets up a location to store an integer and the location is called intAge.

An array is an object. The array name stores the address of a block in memory that stores a number of the same type of item under one name.

A good comparison is a house and a townhouse complex. A house is a living space for one family or group of people and it has a unique address such 5555 Dixie Road. A townhouse complex may have one address but needs a sub-address so that everyone can get their mail. The address might be 5555 Dixie Road Unit 2.

In Java the sub-address is specified with a number. To store 10 ages instead of 1 the java statement:

```
int[] intAge=new int [10];
```

creates a 10 element array. The name of the array is intAge, the sub-address is specified within the square brackets. The number inside the brackets is called the index or subscript of the array.

Declaring an Array

An array is declared by stating the type, the name on the left side of an equal sign and the word new and the type again, and the size on the right side. The statement:

```
double[] intSales=new double [25];
```

creates an array that could store 25 numbers with decimals such as sales figures.

The statement:

```
string[] strName= new string[25];
```

creates an array to hold 25 names.

Remember the statement “string [] args” from the main method definition. What type of array is this?

Assigning Values to Array Elements

An array element is one storage location within the array. The elements are numbered with integers starting at 0. The statement:

```
intAge[0]=15;
```

places the value 15 in the first array location. The statement:

```
intAge[2]=17;
```

places the value 17 in the third array location. In this case, the array element is 17, its index or subscript is 2.

Simultaneous Declaration and Initialization

An array can be declared and initialized with values in one statement. The statement

```
int[] age={12,14,17,18,20};
```

or

```
int[] intAge = new int[5] {12,14,17,18,20};
```

The size is determined by the number of data values, in this case the array would contain 5 elements.

```
intAge[0]->12
intAge[1]->14
intAge[2]->17
intAge[3]->18
intAge[4]->20
intAge[5]->ERROR!
```

Arrays Loops

Integer (int) variables can be used inside the square brackets of an array. This allows loops to be used with arrays very easily.

For example, to declare and initialize an array of ten elements, the following statements:

```
  int[] age = new age [10];

for (int i = 0 ; i < 10 ; i++)
  {
      age [i] = 0;
  }
```

will set up an array of 10 elements and set the value of each element to 0.