Information About Arrays and Working With Arrays In the C# Programming Language

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Annotation: This article is written to provideall students withcomplete information about arrays, tohelpthemunderstandhow to work withthemin the C# programming language, and togetthemmore interested in the subject.

Keywords: arrays, one-dimensional arrays, multi-dimensional arrays, faceted arrays, dynamic and static arrays, working with arrays in C# programming language.

The C# programming language requires the use of computer memory for multiple values using a single variable To perform operations on multiple values in a single variable, the given data must belong to the same type In the C# programming language, multiple values are stored in a single variable. The C# programming language uses array types to store multiple values in a single variable. In programming languages, data in the form of a list or table is called an array. The word array means size, measurement. The elements of an array all belong to the same type, are called by the same name, and differ from each other by number (index).

Now, let's get acquainted with the data structures in a program. There are two main types of data structures in a program. One is static and the other is dynamic. Static means a structure that does not change its position in memory and is given at the beginning of the program. A static array is an array whose number of elements is known in advance and initialized (fixed value). Dynamic data types can be changed in size and memory during the program. The number of elements in a dynamic array is known in advance and does not need to be initialized (set to a value). The disadvantage of static arrays is that they waste memory if the size is set too large in advance, leaving most of it unnecessary. To solve this problem, C# declares arrays dynamically. Arrays are the most commonly used data type in programming. An array is a sequence of variables of the same type in memory; to specify a single variable, enter the name of the array and the index of the desired variable.

> **interpretation:** anorderedset ofdata belonging to one type and storedunderonename is called an array.

Arrays are stored in computer memory in a single variable, and their elements are sorted by a specific index. Arrays can hold multiple values under a single name, an example of which is a

mathematical vector. Vectors are also stored under a single name, and their composition can contain multiple values. The elements of a vector belong to the same type and are ordered.

The table below shows the difference between static and dynamic arrays.   **Static**

●Static arrays are allocated memory at compile time	●Dynamic array allocates memory located at runtime.
●The size of the static array is fixed (in advance).	●The size of the dynamic array is fixed (at runtime).
●It is located in the stack memory area.	●It is located in the heap memory area.
●int array[10]; // 10 size array	●int* array = new int[10];

arrays   **Dynamic arrays**

One-dimensional arrays

Arrays are usually needed when solving problems involving a large number of ordered, but finite, elements. During the use of the program, the array must have a specific name and its elements must be of a specific type. One-dimensional arrays are stored in computer memory in the following   form
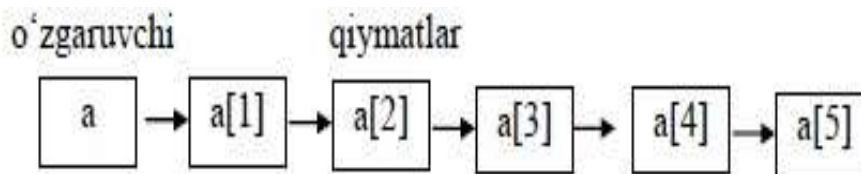
Multidimensional arrays

Contains multiple rows of data, so its index is a pair of numbers that identify the row and identify the column. Such an array is often referred to as a rectangular array, because it takes the shape of a rectangle when schematically represented.

Consider multidimensional arrays as 2-dimensional arrays We can think of one-dimensional arrays as a single horizontal array, for example:

int[] nums1 = new int[] { 0, 1, 2, 3, 4 };

This is a visual representation of the array

The result
0
1

2
3
4

Now let's look at an example of a two-dimensional array:

```
int[,] nums2 = { { 0, 1, 2 }, { 3, 4, 5 } };
```

Visually, it is massive:

The result
0
1
2
3
4
5

Square brackets are used to declare multidimensional arrays, ie [,] for a two-dimensional array, [,,] for a three-dimensional array, and so on.

```
int[,] arr2d; // a two-dimensional array

int[,,] arr3d; // a three-dimensional array

int[,,,] arr4d; // a four-dimensional array

int[,,,,] arr5d; // a five-dimensional array
```

Edge Array. This is an array consisting of subarrays (subarrays may be of any size).

The array contains elements. The maximum number of elements the array can hold is its size. The position of an element in the array is called its index. The elements of an array are referenced by their indices. An integer is the index of the array. In other words, no two arrays have the same name. Its name must not duplicate the name of a previously declared ordinary variable.

Conclusion

It is no secret that not only Uzbeks, but the whole world is interested in programming, and the development of the IT industry is important for the country's economy. Today, an efficient economy, quality education, and modern and innovative production processes are inconceivable without ICT. In this context, one of the key directions of digital development is the training of IT specialists, who are in demand in almost all sectors of the economy. One of the priority conditions

is to establish a comprehensive system for the continuous development of IT personnel within the framework of schooling, secondary special education, and higher education. Because of the importance of building a quality educational infrastructure to develop competent personnel in all fields, a number of initiatives aimed at supporting IT education have been implemented in our country. As a result, there is currently a great deal of interest in creating a quality infrastructure in the training of qualified personnel. There is a need to prepare books, articles, and other IT-related papers in Uzbek in a form that young people can understand.

Foydalanilgan adabiyotlar:
1. S.Eshtemirov va F.M.Nazarov "Algoritm va dasturlash asoslari"
2. Sh.F.Madraximov va S.M. Gaynazarov "C++tilida programmalash asoslari"
3. Pro C# 8 with .Net Core 3
4. "C# 7.0 Справочник" Джозеф Аобахари и Бен Албахари