

Arrays are something in which we can store more than one thing. For example in an int variable we can store only one number but if we have an array then we can store more than one number into it. A particular value in an array is referenced by writing an integer number called index number or subscript in square brackets after the array name. The least value that an index can take in array is 0. Arrays are of two types:

1. One-dimensional array or single dimensional array
2. Multi-dimensional array

There are two ways to initialize an array:

- i. Static or constant initialization - here the array is initialised at the same time when it is declared.
- ii. Dynamic initialization - the array is initialised at a later point of time with respect to where it is declared. Generally we use a for loop to declare arrays in this method.

## **One-Dimensional Array**

This type of arrays contains a single row of elements.

The syntax for declaring an array is,

```
data_type array_name(SIZE);
```

As it is clear that the array has three main parts,

- a) `data_type`: it must be a valid C data type and it is common to all the elements of an array.
- b) `array_name`: It must be a valid name and should follow all the principles of declaring a variable name.
- c) `SIZE`: It is a constant value and defines the maximum capacity of an array.

The following are the two types of methods by which we can declare and initialize these types of arrays,

1. 

```
int arr[5] = {1,2,3,4,5};
```
2. 

```
int arr[5], i;
printf("Enter the numbers in the array : \n");
for(i = 0; i < 5; i++)
{
    scanf("%d", &arr[i]);
}
```

The following is the code to print an array,

```
for(i = 0; i < 5; i++)
{
    printf("%d ", arr[i]);
}
```

Q. Write a program to sort the elements of an array in ascending order.

<https://youtu.be/nqQJy5mumN8>

Q. Write a program to delete an element from an array at a position entered by the user.

<https://youtu.be/aJ9GgQv-UMs>

## Multi-Dimensional Array

It is simply defined as a collection of arrays. For example, a two-dimensional array(2D array) is a collection of one-dimensional array(1D array) and a n-dimensional array is a collection of n-1 dimensional array. The 2D array is the most popular amongst all other multi-dimensional array. Its syntax is given below,

```
data_type array_name[row-size][col-size];
```

the data\_type and array\_name is same as a 1D array. As in the name 2D arrays have 2 dimensions rows and columns. Hence while declaring a 2D array we need to mention a size for both of them. We can declare a 2D array in the following method,

```
int arr[5][5], i, j;
printf("Enter the numbers in the array : \n");
for(i = 0; i < 5; i++)
{
    for(i = 0; i < 5; i++)
    {
        scanf("%d",&arr[i]);
    }
}
```

The following is the code to print a 2D array,

```
for(i = 0; i < 5; i++)
{
    for(j = 0; j < 5; j++)
    {
        printf("%d ", arr[i]);
    }
    printf("\n");
}
```

Q. Write a program to find the norm of a given square matrix. [Hint: Norm= SQRT (sum of squares of the individual elements of an array)].

[https://youtu.be/6W\\_YJRAjO74](https://youtu.be/6W_YJRAjO74)

Q. Write a program to check whether a matrix is symmetric matrix or not.

<https://youtu.be/R3slxExxSes>

LINK FOR QUESTIONS (PLS SOLVE ALL OF THEM)

<https://youtu.be/PyA4EeflohA>