

---

---

## C Array

### Arrays in C Programming Language

In C programming language, array is a collection of many values of the same type. By declaring a normal variable, it can store only one value at a time. Doing is not applicable when you have many values to be store in a single variable. Creating many variables to store those values is not feasible either. The better choice in this scenario is to use an array. The array can be one or multi-dimensional array. Programmers mostly use one and two-dimensional arrays.

### One-Dimensional Array

-Declaring one-dimensional array

To declare a one-dimensional array in C, you must write down the data type followed by the name of the array and braces [].

Example

```
int i[];
```

To specify the size of array, you need to set it in braces as below.

```
int i[5]; //the array i contains 5 elements
```

-Initializing array

To initially assign values to the array, you can write those values as below.

```
int i[]={ 1, 2, 3, 4, 5 }; //The array got values:1,2,3,4,and 5  
or
```

```
int i[5];
```

```
  i[0]=1;
```

```
  i[1]=2;
```

```
  i[2]=3;
```

```
  i[3]=4;
```

```
  i[4]=5;
```

Note: The start index of the array is 0 and the last index is equal to its size subtracted by 1.

-Accessing elements of an array

You can access the elements of array by specify their indexes.

Example:

```
int i[5];

i[0]=1; //assign values to the array

i[1]=2;

i[2]=3;

i[3]=4;

i[4]=5;

int j;

for(j=0;j<5;j++) cout<<i[j]<<" "; //accessing values from the array

}

}
```

### Two-dimensional array

Index	0	1	2
0	1	2	3
1	4	5	6
2	7	8	9

To create and use a two-dimensional array, you will use two square brackets instead of one.

Example:

```
int i[3][3] ; //The two-dimensional array contains 3 rows and 3 columns
a[0][0] = 1; //Assign 1 to the first cell of the array
```

## Exercises

1. Write a program that will prompt the user to input ten integer values. The program will display the smallest and greatest of those values. It also displays the value that occur the most.

### Solution:

```
#include <stdio.h>

#include <stdlib.h>

int main(int argc, char *argv[])
{
    int arr[10];

    int mode[10][2];

    printf("Enter 10 integer values separated by space:");

    scanf("%d %d %d %d %d %d %d %d %d %d",&arr[0], &arr[1], &arr[2], &arr[3], &arr[4],
    &arr[5], &arr[6], &arr[7],&arr[9],&arr[9]);

    //find the max value and min value

    int i,j,temp;

    //sort array to find max and min values
    for(i=0;i<10;i++)
        for(j=0;j<10;j++)
            if(arr[j]>arr[j+1]){temp=arr[j];arr[j]=arr[j+1];arr[j+1]=temp;}

    printf("Max=%d,Min=%d",arr[9],arr[0]);

    printf("\n");

    //initialize 2D array storing numbers of occurences, and values
    for(i=0;i<2;i++)
        for(j=0;j<10;j++)mode[j][i]=0;
```

```
mode[0][0]=1;

//find mode

for(i=0;i<10;i++)

for(j=0;j<10;j++)

if(arr[i]==arr[j+1]) { ++mode[i][0];mode[i][1]=arr[i];}

//find max occurrence

int max;

int k=0;

max=mode[0][0];

for(j=0;j<10;j++)

if(max<mode[j][0]){ max=mode[j][0];k=j;}

//print result

printf("The most occurring item:%d",mode[k][1]);printf("\n");

printf("It occurs %d",max); printf("times.");

printf("\n");

system("PAUSE");

return EXIT_SUCCESS;

}
```

2. Write a program to sort 10 integer values (reading from keyboard) in ascending and descending order.

**See solution 1**

For more C exercises visit <http://www.worldbestlearningcenter.com>