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C Arrays

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C Arrays

- An array is a group of variable that can store multiple values with same datatype. For example, if you want to store 100 integers, you can create an array for it.
- int data[100];
- Another Definition: Array group of variable having the same datatype allocated one behind the other in the memory with same name

C Arrays

How to declare an array?

- dataType arrayName[arraySize];
- arraySize => fixed value

For example:

- float mark[5];

C Arrays

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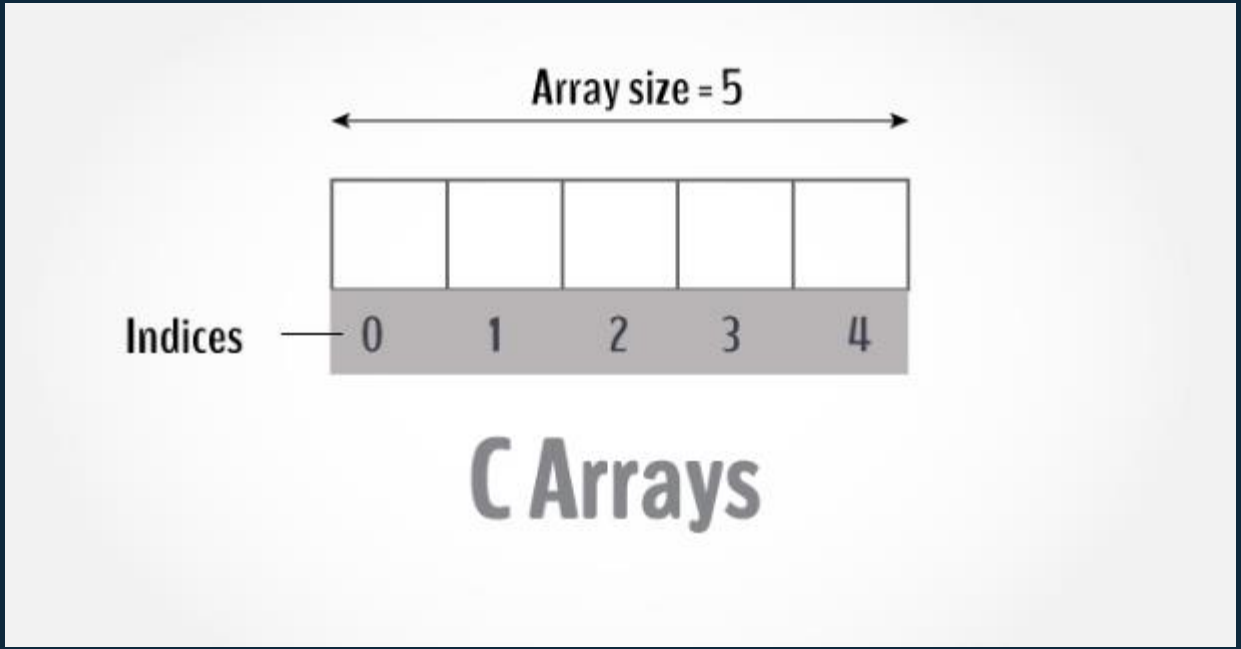
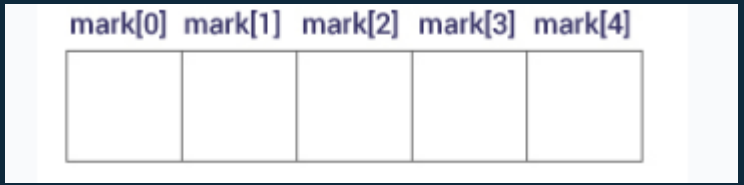
C Arrays



Access Array Elements

- You can access elements of an array by indices.
- Suppose you declared an array mark as above. The first element is mark[0], the second element is mark[1] and so on.



Access Array Elements

Few keynotes:

- Arrays have 0 as the first index, not 1. In this example, mark[0] is the first element.
- If the size of an array is n, to access the last element, the n-1 index is used. In this example, mark[4]
- Suppose the starting address of mark[0] is **2120d**. Then, the address of the mark[1] will be **2124d**. Similarly, the address of mark[2] will be **2128d** and so on.
  This is because the size of a float is 4 bytes.
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How to initialize an array?

- It is possible to initialize an array during declaration.

For example,

- int mark[5] = {19, 10, 8, 17, 9};You can also initialize an array like this.
- int mark[] = {19, 10, 8, 17, 9};Here, we haven't specified the size. However, the compiler knows its size is 5 as we are initializing it with 5 elements.

How to initialize an array?

Here,
mark[0] is equal to 19
mark[1] is equal to 10
mark[2] is equal to 8
mark[3] is equal to 17
mark[4] is equal to 9

C Multidimensional Arrays

- you will learn to work with multidimensional arrays (two-dimensional) with the help of examples.
- In C programming, you can create an array of arrays. These arrays are known as multidimensional arrays.

For example:

- float x[3][4];

C Multidimensional Arrays

	Column 1	Column 2	Column 3	Column 4
Row 1	x[0][0]	x[0][1]	x[0][2]	x[0][3]
Row 2	x[1][0]	x[1][1]	x[1][2]	x[1][3]
Row 3	x[2][0]	x[2][1]	x[2][2]	x[2][3]

Initializing a multidimensional array

- Here is how you can initialize two-dimensional and three-dimensional arrays:

Initialization of a 2d array

```
// Different ways to initialize two-dimensional array
int c[2][3] = {{1, 3, 0}, {-1, 5, 9}};
int c[][3] = {{1, 3, 0}, {-1, 5, 9}};
int c[2][3] = {1, 3, 0, -1, 5, 9};
```

Thanks!

Any questions?