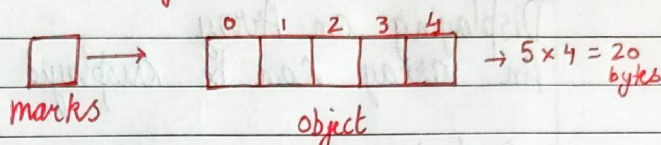


## Chapter 6 - Arrays

Array is a collection of similar types of data

Use Case: Storing marks of 5 Students

`int[] marks = new int[5]`  $\Rightarrow$  [data type ArrayName]  
reference                      object



### Accessing Array Elements

Array elements can be accessed as follows

`marks[0] = 100`

`marks[1] = 70`

`⋮`

`marks[4] = 98`

$\Rightarrow$  Note that index starts from 0

So in a nut shell, this is how array works:

1. `int[] marks;`

$\rightarrow$  Declaration!

`marks = new int[5];`

$\rightarrow$  Memory Allocation!

2. `int[] marks = new int[5];`

$\rightarrow$  Declaration + Memory Allocation!

3. `int[] marks = {100, 70, 80, 71, 98};`

$\rightarrow$  Declare + Initialize!

Array indices starts from 0 and goes till  $(n-1)$   
where  $n$  is the size of the array.



## Array length

Arrays have a length property which gives the length of the array

marks.length  $\rightarrow$  gives 5 if marks is a reference to array with 5 elements

## Displaying an Array

An array can be displayed using a for loop:

```
for (int i = 0; i < marks.length; i++)  
{  
    Sout (marks[i]);  
}
```

$\Rightarrow$  Array Traversal

Quick Quiz: Write a Java program to print the elements of an array in reverse order.

## For-each loop in Java

Array elements can also be traversed as follows:

```
for (int element : Arr) {  
    Sout (element);  
}
```

$\Rightarrow$  Prints all the elements

## Multidimensional Arrays

Multidimensional Arrays are Array of Arrays

Each element of a M-D array is an array itself  
marks in the previous example was a 1-D array.



## Multidimensional 2-D Array

A 2-D array can be created as follows:

```
int [][] flats = new int [2][3]
```

↳ A 2-D array of 2 rows + 3 columns

We can add elements to this array as follows

flats [0][0] = 100

flats [0][1] = 101

flats [0][2] = 102

⋮

& so on!

This 2-D array can be visualised as follows:

	[0]	[1]	[2]
	Col 1	Col 2	Col 3
[0] Row 1	(0, 0)	(0, 1)	(0, 2)
[1] Row 2	(1, 0)	(1, 1)	(1, 2)

Similarly a 3-D array can be created as follows:

```
String [][][] arr = new String [2][3][4]
```