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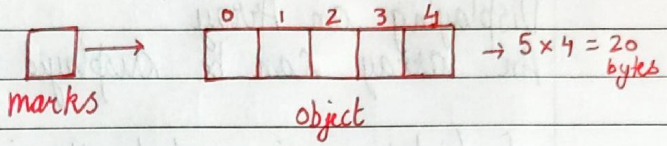
Chapter 6 - Arrays

Array is a collection of similar types of data

Use Case : Storing marks of 5 students

`int [] marks = new int [5]` ⇒ [dataType ArrName;]

reference — object



Accessing Array Elements

Array elements can be accessed as follows

```
marks[0] = 100
marks[1] = 70
   .
   .
   .
marks[4] = 98
```

⇒ Note that index starts from 0

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

1. `int [] marks;` → Declaration!
   `marks = new int[5];` → Memory Allocation!
2. `int [] marks = new int[5];` → Declaration + Memory Allocation!
3. `int [] marks = {100, 70, 80, 71, 98}` → Declare + Initialize!

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

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Array length

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

marks.length → 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]);
}
```

=> 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);
}
```

=> 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.

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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]
```