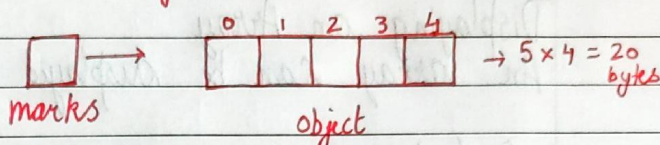


Chapter 6 - Arrays

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`

\vdots

`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]
```