

## Arrays

### **Introduction**

- An array is an indexed collection of fixed number of **homogeneous** data elements.
- The main advantage of arrays is we can represent **multiple values** with the same name  
So that readability of the code will be improved.

**But the main disadvantage of arrays is:**

- **Fixed in size** that is once we created an array there is no chance of increasing or  
Decreasing the size, based on our requirement that is to use arrays concept compulsory
- We should know the size in advance which may not possible always.

**We can resolve this problem by using collections.**

**Array declarations:**

Example:

- ❖ `int[] a;` //recommended to use because name is clearly separated from the
- ❖ `int []a;`
- ❖ `int a[];`

**Every array in java is an object hence we can create by using new operator.**

Example:

- `int[] a=new int[3];`

**Rule 1:**

At the time of array creation compulsory **we should specify the size** otherwise we will get compile time error.

Example:

- `int[] a=new int[3];`
- `int[] a=new int[];` //C.E:array dimension missing

**Rule 2:**

It is legal to have **an array with size zero in java.**

Example:

- `int[] a=new int[0];`
- `System.out.println(a.length);`//0

**Rule 3:**

- If we are taking array size with -ve int value then we will get runtime exception saying `NegativeArraySizeException`.

Example:

- `int[] a=new int[-3];`//R.E:NegativeArraySizeException

Rule 4:

- The maximum allowed array size in java is maximum value of int size [2147483647].

Example:

- `int[] a1=new int[2147483647];`(valid)
- `int[] a2=new int[2147483648];`
- `//C.E:integer number too large: 2147483648`(invalid)

**Note:** Whenever we are trying to print any object reference internally `toString()` method will be executed which is implemented by default to return the following. `classname@hexadecimalstringrepresentationofhashcode`.

**Note:** If we are trying to access array element with out of range index we will get Runtime Exception saying **ArrayIndexOutOfBoundsException**.

- ❖ Arrays are not used widely in Java but better to have an understanding of it, as all the interview questions are from arrays wrt **Algos and DS**.

Few Practice problems on Arrays

- ❖ Find the Given number index
- ❖ Sum of elements in an array.
- ❖ Searching Algorithms
- ❖ Sorting Algorithms etc.

**Var- arg methods (variable no of argument methods) (1.5)**

- Until 1.4v we can't declared a method with variable no. Of arguments.
- If there is a change in no of arguments compulsory we have to define a new method.
- This approach increases length of the code and reduces readability.
- But from 1.5 version onwards we can declare a method with variable no. Of arguments such type of methods are called var-arg methods.

**Example:**

```
class Test
{
    public static void methodOne(int... x)
    {
        System.out.println("var-arg method");
    }
    public static void main(String[] args)
    {
        methodOne();
        methodOne(10);
        methodOne(10,20,30);
    }
}
```

Output:

```
var-arg method
var-arg method
var-arg method
```

General method priority.