Core Java 8

Lesson 13 : Arrays

Lesson Objectives

After completing this lesson, participants will be able to

- Understand the different types of Arrays
- Implement one and multi dimensional arrays
- Iterate arrays using loops
- Use varargs
- Work with java.util.Arrays

Arrays

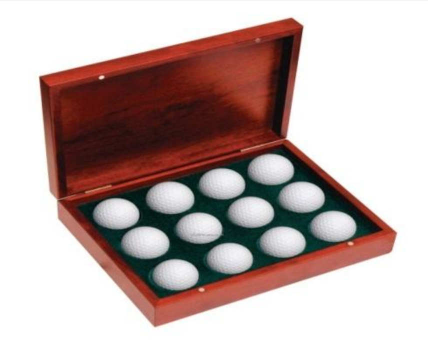
Arrays are used to group elements of either of primitive or reference types

Array in java is created as Object:

- This object will help developers to find size of array
- Using this object developers can manipulate array
- Can be compared with null

All elements of array of same type

Array is a fixed-length data structure having zero-based indexing



Arrays

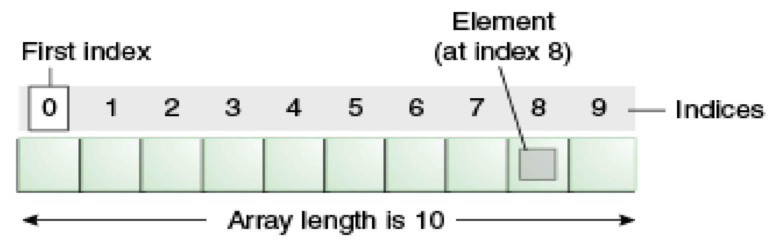
array is a collection of similar type of elements that have contiguous memory location.

Java array is an object the contains elements of similar data type. It is a data structure where we store similar elements. We can store only fixed set of elements in a java array.

Array in java is index based, first element of the array is stored at 0 index.

- int arr [];

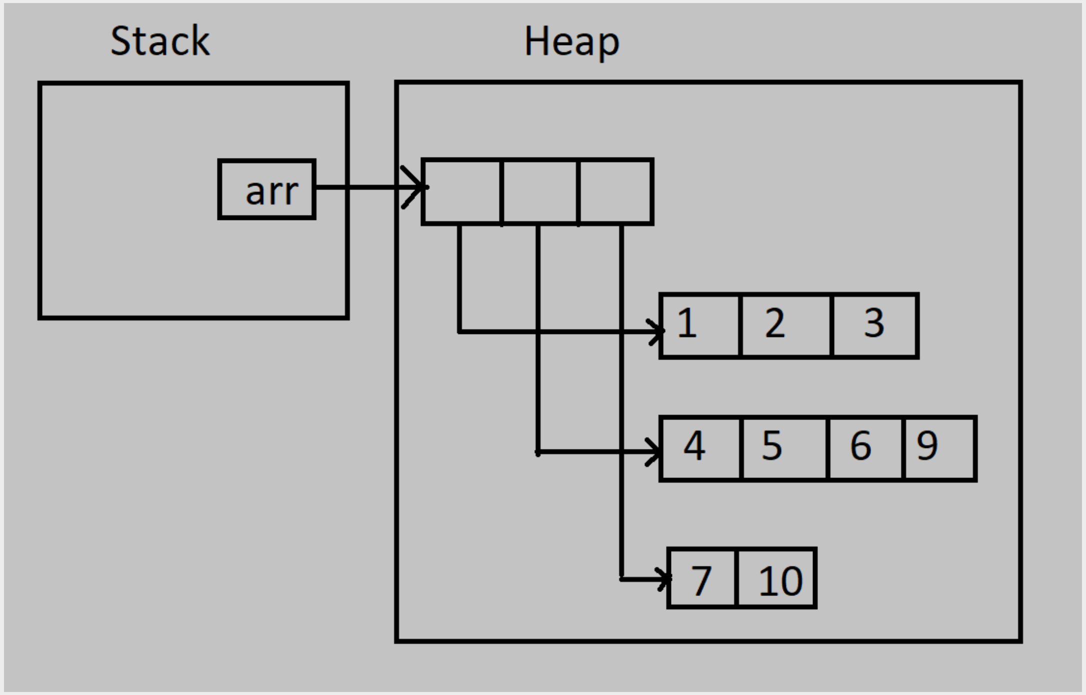
  arr = new int[10];



2 Dimensional Arrays

Here's an example to initialize a 2d array in Java.

```
int[][] arr = {
     {1, 2, 3},
     {4, 5, 6, 9},
     {7,10},
};
```



Creating Array Objects

Arrays of objects too can be created:

- Example 1:

```
Box barr[] = new Box[3];
barr[0] = new Box();
barr[1] = new Box();
barr[2] = new Box();
```

```
String[] Words = new String[2];
Words[0]=new  String(“Bombay”);
Words[1]=new  String(“Pune”);
```

- Example 2:

13.1: array

Demo

Executing the ArrayDemo.java program

Enhanced for Loop (foreach)

New feature introduced in Java 5

Iterate through a collection or array

- Syntax:

```
for (variable : collection)
{ //code}
```

- Example

```
int sum(int[] intArray)
{
    int result = 0;
    for (int index : intArray)
        result += index;
     return result;
 }
```

Variable Argument List

New feature added in J2SE5.0

Allows methods to receive unspecified number of arguments

An argument type followed by ellipsis(…) indicates variable number of arguments of a particular type

- *Variable-length* argument can take from *zero* to *n* arguments
- Ellipsis can be used only once in the parameter list
- Ellipsis must be placed at the end of the parameter list

Variable Argument List (contd..)

The above print function can be invoked using any of the invocations:

- print(1,1,”XYZ”)
- print(2,5)
- print(5,6,”A”,”B”)

```
//Valid Code
void print(int a,int b,String...c)
{
        //code
}
```

```
//Invalid  Code
void print(int a, int b…,float c)
{
      //code
}
```

Varargs can be used only in the final argument position.

Demo

Execute the varargs.java program

Using java.util.Arrays Class

This class contains lots of useful methods to manipulate contents of array

Method Name	Use
asList	Creates a new List from array
binarySearch	Use to search an element in an array
copyOf(array,n)	Creates new array of n size and copy all elements from array to new one
copyOfRange(array,n,from,to)	Creates new array of n size and copy specified elements from array to new one
sort	Sort elements of an array
equals	Compare two array elements
fill	Inserts specified value to each element of an array
stream(array)	Creates stream from an array

Demo

Execute the UsingArrays.java program

Summary

In this lesson, you have learnt about:

- Creating and using array
- Manipulating array
- Iterating array
- Varargs
- Using java.util.Arrays class

Review Question

Question 1: If a display method accepts an integer array and returns nothing , is following call to display method is correct? State true or false.

- display({10,20,30,40,50})

Question 2: All methods in java.util.Arrays class are static (excluding Object class methods).

- True/False