Core Java 8 and Development Tools

Lesson 10 : 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

- A group of like-typed variables referred by a common name
- Array declaration and initialization:
  - int arr [];

    arr = new int[10];
  - int arr[] = {2,3,4,5};
  - int twoDim [][] = new int[4][5];

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();
    ```

  - Example 2:

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

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;
}
```

Arrays

- 2 Diamentional Array declaration and initialization:
  - int arr[][] ={ {2,3},{4,5},{34,56}};
  - int twoDim [][] = new int[4][5];

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.

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Demo

- Lesson-10-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 NewForArray.java program

Summary

- In this lesson, you have learnt about:
  - Creating and using array
  - Manipulating array
  - Iterating array
  - Varargs
  - Using java.util.Arrays class

Summary

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