# Assignment - 05

## CSA0992 - Programming In Java For Freshers

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Q: Explain any 8 collection classes in Java Present in set, List and Map interface with programs. for example, Linked list and Arraylist from List Interface.

Ans

## Collections:-

→ The collections in Java provide an architecture to store and manipulate the group of objects, interfaces and classes.

→ A collection is a group of objects or it is a single entity that represents multiple objects.

→ Java collection framework consists of classes and interfaces by using these classes and interfaces developers can represent a group of objects in a single entity.

→ Collection framework is present in package java.util.

→ The collections in Java provides an architecture to store and manipulate. This framework has several

Useful functions that have tons of useful functions, making a programmer task super easy.

↝ This frame work provides many interfaces (Queue, Set, List, Dequeue) and classes (Priority Queue, Hashset, Array list, vector, Linked List, linked hash set).

## COLLECTION FRAMEWORK:-

↝ The collection framework is a unified architecture for storing and manipulating a group of objects.

↝ The collection framework was designed to meet several goals, Such as -

* The framework had to be high-performance and adapt a collection easy method.

* The implementations for the fundamental collections were to be highly efficient.

* The framework had to allow different types of collections to work in a similar manner.

* The framework had to extend and / or adapt a collection easily

## 1. HASH SET [set Interface]:-

* Hash set is a class that implements the set Interface.

* It stores elements in an unordered manner and does not allow duplicate elements.

* It uses a hash table for internal storage, which makes it efficient for operations like add, remove and contains.

### EXAMPLE PROGRAM:-

```
import java. util. Hashset;
import java. util. Set;
  public class HashSetExample.
  {
   public static void main (String [] args)
   {
     Set <String> set = newHashset <> ();
     Set. add ("Apple");
     Set. add ("Banana").
     Set. add ("cherry");
     Set. add ("Banana");
```

```
    for (String fruit : set)
    {
        System.out.println (fruit);
    }
  }
}
```

## 2. ARRAYLIST [List Interface]:-

* Array list is a class that implements the list interface

* It Stores elements in a dynamic array, allowing duplicat elements and maintaining the order of insertion.

* Provides fast access to elements by index.

EXAMPLE PROGRAM:-

```
import java.util.Arraylist;
import java.util.List;

  public class ArrayListExample
 {
   public static void main (String [ ] Args)
   {
    List <Integer> List = new Arraylist <>();
```

```
        list.add(5);
        list.add(10);
        list.add(15);
        list.add(10);
       int firstElement = List.get(0);
      for (Integer num: List)
        {
         System.out.println(num);
      }
   }
}
```

3. HASH MAP [Map Interface]:-

* Hash Map is a class that implements the Map interface.

* It stores key-value pairs and does not allow any duplicate keys.

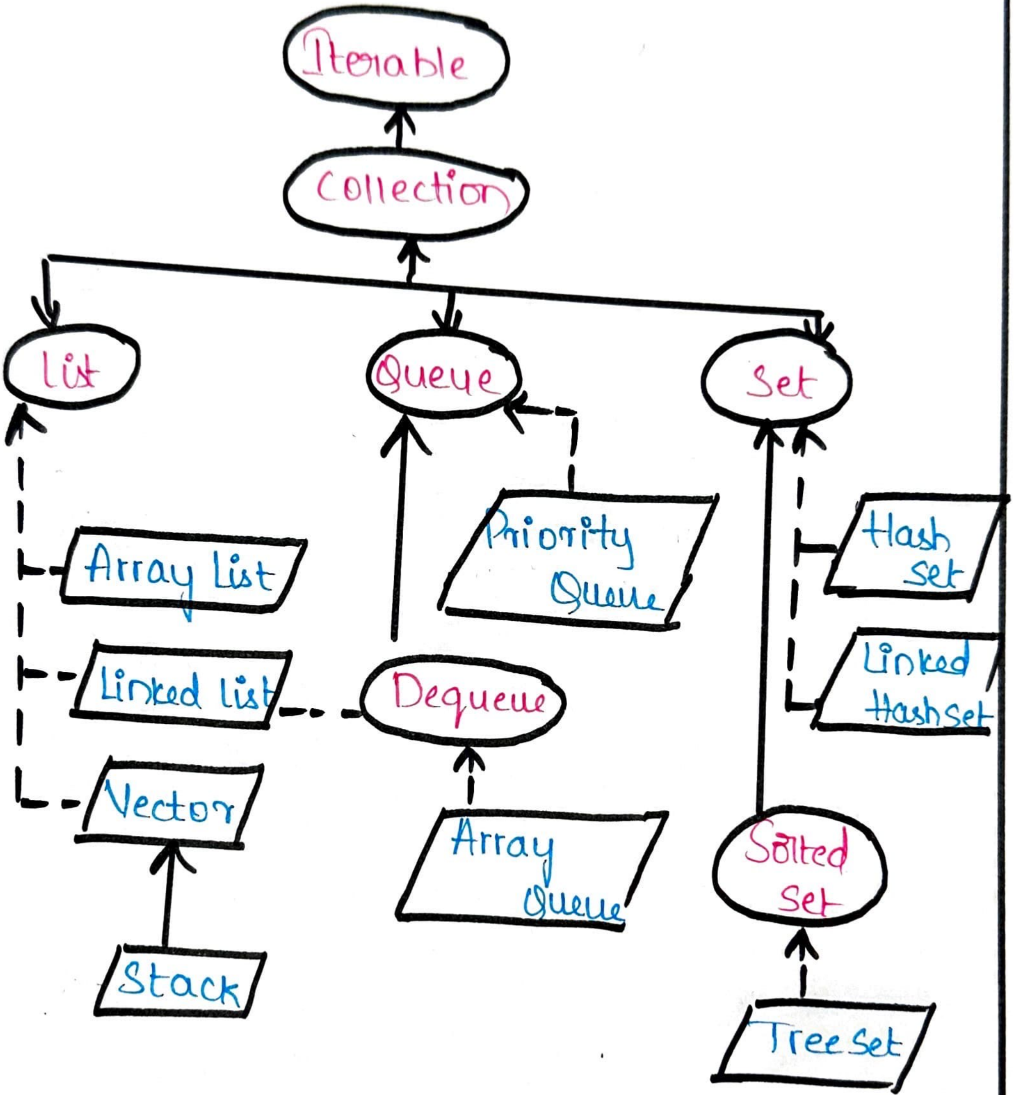
* keys are used to retrieve values quickly.

* As the valus are retrieved quickly it makes it efficient for the data retrieval.

EXAMPLE PROGRAM:-

```
import java.util.HashMap;
import java.util.Map;
public class HashMapExample
 {
   public static void main (String[] args)
    {
      Map <string, Integer> map = new HashMap<>();
     map.put ("Alice", 25);
     map.put (" Bob", 30);
     map.put ("Alice", 28);
     int aliceAge = map.get ("Alice");
     for (Map.Entry<String, Integer> entry:
                   map.entrySet())
     {
     System.out.println (entry.getKey() + ":" +
              entry.getValue());
   }
 }
}
```

# HIERARCHY OF COLLECTION FRAMEWORK :-



Iterable
Collection
List
Queue
Set
Array List
Linked list
Vector
Stack
Priority Queue
Dequeue
Array Queue
Hash set
Linked Hashset
Sorted Set
Tree Set