16. COLLECTIONS

1.ArrayList-

```
import java.io.*; import java.util.*;
class Main {
public static void main(String[] args)
throws IOException
{
// size of ArrayList
int n = 10;
//declaring ArrayList with size 10
ArrayList<String> arrli = new ArrayList<String>(n);
// Adding 10 elements to the list
arrli.add("a");
arrli.add("b");
arrli.add("c");
arrli.add("d");
arrli.add("e");
arrli.add("f");
arrli.add("g");
arrli.add("h");
arrli.add("i");
arrli.add("j");

System.out.println("Original ArrayList : ");
System.out.println(arrli);

//iterating
Iterator i = arrli.iterator();
    System.out.println("Using iterator,the ArrayList elements are:");
    while (i.hasNext()) {
      System.out.println(i.next());
    }

//Add an element at a specific index
arrli.add(4,"x");
System.out.println("After adding an element at index 4,ArrayList : ");
System.out.println(arrli);

// Remove element at index 3
arrli.remove(3);
System.out.println("After removing element at index 3,ArrayList : ");
System.out.println(arrli);

//Update the element at a specific index
arrli.set(5,"y");
System.out.println("After updating element at index 5,ArrayList : ");
System.out.println(arrli);

//Get an element at a particular index
```

```
System.out.println("The element at index 2 is : " + arrli.get(2));

//Finding out the size of the ArrayList
System.out.println("Size of arraylist is :  "+arrli.size());

//Check if the element is present
System.out.println("Checking whether the element is present :");
System.out.println(arrli.contains("a") );

//Remove all elements of the ArrayList
arrli.removeAll(arrli);
System.out.println("After removing all the  elements, ArrayList : ");
System.out.println(arrli);

}
}
```

Output-

```
Original ArrayList :
[a, b, c, d, e, f, g, h, i, j]
Using iterator,the ArrayList elements are:
a
b
c
d
e
f
g
h
i
j
After adding an element at index 4,ArrayList :
[a, b, c, d, x, e, f, g, h, i, j]
After removing element at index 3,ArrayList :
[a, b, c, x, e, f, g, h, i, j]
After updating element at index 5,ArrayList :
[a, b, c, x, e, y, g, h, i, j]
The element at index 2 is : c
Size of arraylist is :  10
Checking whether the element is present :
true
After removing all the  elements, ArrayList :
[]
```

2.HashMap -

```
import java.util.HashMap;
class Main {
public static void main(String[] args)
{
```

```
   // Create an empty hash map
   HashMap<String, Integer> map = new HashMap<>();

   // Add elements to the map
      map.put("a", 1);
      map.put("b", 2);
      map.put("c", 3);
      map.put("d", 4);
      map.put("e", 5);
      map.put("f", 6);
      map.put("g", 7);
      map.put("h", 8);
      map.put("i", 9);
      map.put("j", 10);

   System.out.println("Original HashMap : ");
   System.out.println(map);


   //Fetch the value of a Key 5
      System.out.println("The Value is: " + map.get(5));

   //Check if the given Key is in the Map
   System.out.println("Checking if the given Key(20) is in the Map: "+map.containsKey(20));

   //Check if the value is in the Map
   System.out.println("Checking if the given value(g) is in the Map: "+map.containsValue("g"));

   //Check if the map is empty
    System.out.println("Checking if the map is empty : "+map.isEmpty());

   //Print the size of the Map to the console
   System.out.println("Size of the map : "+map.size());

   //Print the map
   System.out.println(map);

   //Remove a specific Key-value pair
   map.remove(2);
   System.out.println("After removing a speific key-value pair, HashMap : ");
   System.out.println(map);
}
}
```

Output-

```
Original HashMap :
{a=1, b=2, c=3, d=4, e=5, f=6, g=7, h=8, i=9, j=10}
The Value is: null
Checking if the given Key(20) is in the Map: false
Checking if the given value(g) is in the Map: false
```

```
Checking if the map is empty : false
Size of the map : 10
{a=1, b=2, c=3, d=4, e=5, f=6, g=7, h=8, i=9, j=10}
After removing a speific key-value pair, HashMap :
{a=1, c=3, d=4, e=5, f=6, g=7, h=8, i=9, j=10}
```

3.HashSet -

```
import java.util.*;
class Main {

   // Main Method
   public static void main(String[] args)
   {
      HashSet<String> h = new HashSet<String>();

      // Adding elements into HashSet usind add()
      h.add("A");
      h.add("B");
      h.add("C");
      h.add("A"); // adding duplicate elements

      // Displaying the HashSet
      System.out.println(h);
      System.out.println("List contains India or not:"+ h.contains("A"));

      // Removing items from HashSet using remove()
      h.remove("A");
      System.out.println("List after removing Australia:"+ h);

      // Iterating over hash set items
      System.out.println("Iterating over list:");
      Iterator<String> i = h.iterator();
      while (i.hasNext())
         System.out.println(i.next());
   }
}
```

Output-

```
[A, B, C]
List contains India or not:true
List after removing Australia:[B, C]
Iterating over list:
B
C
```