

WEEK – 11

1.

Java HashSet class implements the Set interface, backed by a hash table which is actually a [HashMap](#) instance.

No guarantee is made as to the iteration order of the hash sets which means that the class does not guarantee the constant order of elements over time.

This class permits the null element.

The class also offers constant time performance for the basic operations like add, remove, contains, and size assuming the hash function disperses the elements properly among the buckets.

Java HashSet Features

A few important features of HashSet are mentioned below:

- Implements [Set Interface](#).
- The underlying data structure for HashSet is [Hashtable](#).
- As it implements the Set Interface, duplicate values are not allowed.
- Objects that you insert in HashSet are not guaranteed to be inserted in the same order. Objects are inserted based on their hash code.
- NULL elements are allowed in HashSet.
- HashSet also implements **Serializable** and **Cloneable** interfaces.

• `public class HashSet<E> extends AbstractSet<E> implements Set<E>, Cloneable, Serializable`

Sample Input and Output:

5

90

56

45

78

25

78

Sample Output:

78 was found in the set.

Sample Input and output:

3

2

7

9

5

Sample Input and output:

5 was not found in the set.

```
import java.util.HashSet;
```

```
import java.util.Scanner;
```

```
class prog {
```

```
    public static void main(String[] args) {
```

```
        Scanner sc = new Scanner(System.in);
```

```
        int n = sc.nextInt();
```

```
        // Create a HashSet object called numbers
```

```
        HashSet<Integer> numbers = new HashSet<>();
```

```
        // Add values to the set
```

```
        for (int i = 0; i < n; i++) {
```

```
            numbers.add(sc.nextInt());
```

```
        }
```

```

int skey = sc.nextInt();

// Check if skey is present in the set
if (numbers.contains(skey)) {
    System.out.println(skey + " was found in the set.");
} else {
    System.out.println(skey + " was not found in the set.");
}
}
}

```

	Test	Input	Expected	Got	
✓	1	5 90 56 45 78 25 78	78 was found in the set.	78 was found in the set.	✓
✓	2	3 -1 2 4 5	5 was not found in the set.	5 was not found in the set.	✓

2. Write a Java program to compare two sets and retain elements that are the same.

Sample Input and Output:

5

Football

Hockey

Cricket

Volleyball

Basketball

7 // **HashSet 2:**

Golf

Cricket

Badminton

Football

Hockey

Volleyball

Handball

SAMPLE OUTPUT:

Football

Hockey

Cricket

Volleyball

Basketball

CODE:

```
import java.util.HashSet;
import java.util.Scanner;
import java.util.Set;
public class CompareSets
{
    public static void main(String[] args)
    {
        Scanner scanner=new Scanner(System.in);
        int n1=scanner.nextInt();
        scanner.nextLine();
        Set<String> set1=new HashSet<>();
        for(int i=0;i<n1;i++)
        {
            set1.add(scanner.nextLine());
        }
        int n2=scanner.nextInt();
        scanner.nextLine();
        Set<String> set2=new HashSet<>();
        for(int i=0;i<n2;i++)
```

```

    {
        set2.add(scanner.nextLine());
    }
    set1.retainAll(set2);
    for(String element:set1)
    {
        System.out.println(element);
    }
}
}

```

3.

Java HashMap Methods

`containsKey()` Indicate if an entry with the specified key exists in the map

`containsValue()` Indicate if an entry with the specified value exists in the map

`putIfAbsent()` Write an entry into the map but only if an entry with the same key does not already exist

`remove()` Remove an entry from the map

`replace()` Write to an entry in the map only if it exists

`size()` Return the number of entries in the map

Your task is to fill the incomplete code to get desired output

```

import java.util.HashMap;
import java.util.Map.Entry;
import java.util.Set;

public class HashMapMethods {
    public static void main(String[] args) {
        HashMap<String, Integer> map = new HashMap<>();
        map.put("ONE", 1);
        map.put("TWO", 2);
        map.put("THREE", 3);

        Set<Entry<String, Integer>> entrySet = map.entrySet();
        for (Entry<String, Integer> entry : entrySet) {
            System.out.println(entry.getKey() + " : " + entry.getValue());
        }
    }
}

```

```
}
```

```
System.out.println("-----");
```

```
// Creating another HashMap
```

```
HashMap<String, Integer> anotherMap = new HashMap<String, Integer>();
```

```
// Inserting key-value pairs to anotherMap using put() method
```

```
anotherMap.put("SIX", 6);
```

```
anotherMap.put("SEVEN", 7);
```

```
// Inserting key-value pairs of map to anotherMap using putAll() method
```

```
anotherMap.putAll(map);
```

```
// Printing key-value pairs of anotherMap
```

```
entrySet = anotherMap.entrySet();
```

```
for (Entry<String, Integer> entry : entrySet) {
```

```
    System.out.println(entry.getKey() + " : " + entry.getValue());
```

```
}
```

```
// Adds key-value pair 'FIVE-5' only if it is not present in map
```

```
map.putIfAbsent("FIVE", 5);
```

```
// Retrieving a value associated with key 'TWO'
```

```
int value = map.get("TWO");
```

```
System.out.println(value);
```

```
// Checking whether key 'ONE' exists in map
```

```
System.out.println(map.containsKey("ONE"));
```

```
// Checking whether value '3' exists in map
```

```
System.out.println(map.containsValue(3));
```

```

// Retrieving the number of key-value pairs present in map
System.out.println(map.size());
}
}

```

	Test	Input	Expected	Got	
✓	1	3 ONE 1 TWO 2 THREE 3	ONE : 1 TWO : 2 THREE : 3 ----- SIX : 6 ONE : 1 TWO : 2 SEVEN : 7 THREE : 3 2 true true 4	ONE : 1 TWO : 2 THREE : 3 ----- SIX : 6 ONE : 1 TWO : 2 SEVEN : 7 THREE : 3 2 true true 4	✓