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Set in Java

- Set is an interface which extends Collection. It is an unordered collection of objects in which duplicate values cannot be stored.

- Basically, Set is implemented by HashSet, LinkedSet or TreeSet (sorted representation).

- Set has various methods to add, remove clear, size, etc to enhance the usage of this interface

```java
// Java code for adding elements in Set
import java.util.*;
public class Set_example
{
    public static void main(String[] args)
    {
        // Set deonstration using HashSet
        Set<String> hash_Set = new HashSet<String>();
        hash_Set.add("Geeks");
        hash_Set.add("For");
        hash_Set.add("Geeks");
        hash_Set.add("Example");
        hash_Set.add("Set");
        System.out.print("Set output without the duplicates");

        System.out.println(hash_Set);

        // Set deonstration using TreeSet
        System.out.print("Sorted Set after passing into TreeSet");
        Set<String> tree_Set = new TreeSet<String>(hash_Set);
        System.out.println(tree_Set);
    }
}
```

Run on IDE

(Please note that we have entered a duplicate entity but it is not displayed in the output. Also, we can directly sort the entries by passing the unordered Set in as the parameter of TreeSet).

Output:

```
Set output without the duplicates[Geeks, Example, For, Set]
Sorted Set after passing into TreeSet[Example, For, Geeks, Set]
```

Note: As we can see the duplicate entry "Geeks" is ignored in the final output, Set interface doesn't allow duplicate entries.

Now we will see some of the basic operations on the Set i.e. Union, Intersection and Difference.

Let's take an example of two integer Sets:

- [1, 3, 2, 4, 8, 9, 0]
- [1, 3, 7, 5, 4, 0, 7, 5]

Union

In this, we could simply add one Set with other. Since the Set will itself not allow any duplicate entries, we need not take care of the common values.

Expected Output:

```
Union : [0, 1, 2, 3, 4, 5, 7, 8, 9]
```

Intersection

We just need to retain the common values from both Sets.

Expected Output:

```
Intersection : [0, 1, 3, 4]
```

Difference

We just need to remove tall the values of one Set from the other.

Expected Output:

```
Difference : [2, 8, 9]
```

```java
// Java code for demonstrating union, intersection and difference
// on Set
import java.util.*;
public class Set_example
{
    public static void main(String args[])
    {
        Set<Integer> a = new HashSet<Integer>();
        a.addAll(Arrays.asList(new Integer[] {1, 3, 2, 4, 8, 9, 0}));
        Set<Integer> b = new HashSet<Integer>();
        b.addAll(Arrays.asList(new Integer[] {1, 3, 7, 5, 4, 0, 7, 5}));

        // To find union
```

```
        Set<Integer> union = new HashSet<Integer>(a);
        union.addAll(b);
        System.out.print("Union of the two Set");
        System.out.println(union);

        // To find intersection
        Set<Integer> intersection = new HashSet<Integer>(a);
        intersection.retainAll(b);
        System.out.print("Intersection of the two Set");
        System.out.println(intersection);

        // To find the symmetric difference
        Set<Integer> difference = new HashSet<Integer>(a);
        difference.removeAll(b);
        System.out.print("Difference of the two Set");
        System.out.println(difference);
    }
}
```

Run on IDE

Output:

```
Union of the two Set[0, 1, 2, 3, 4, 5, 7, 8, 9]
Intersection of the two Set[0, 1, 3, 4]
Difference of the two Set[2, 8, 9]
```

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