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Homework: List and Set

List interface :

```
package collections;

import java.util.ArrayList;
import java.util.LinkedList;
import java.util.List;
import java.util.Vector;

public class ListDemo {

   public static void main(String[] args) {
      // List Interface
      System.out.println("List Interface :");

      // ArrayList
      List arrayList = new ArrayList();
      arrayList.add("Apple");
      arrayList.add("Banana");
      arrayList.add("Cherry");
      System.out.println("ArrayList Elements: " + arrayList);
      System.out.println("Size of ArrayList: " + arrayList.size());
      System.out.println("Element at index 1: " + arrayList.get(1));
      List<String> additionalElements = new ArrayList<>();
      additionalElements.add("Grapes");
      additionalElements.add("Pineapple");
      arrayList.addAll(additionalElements);
      System.out.println("After adding additional elements: " +
arrayList);
      arrayList.removeAll(additionalElements);
```

```
        System.out.println("After removing all additional elements: " +
arrayList);
        System.out.println("Contains Apple?
:"+arrayList.contains("Apple"));
        arrayList.clear();
        System.out.println("After clearing the ArrayList: " + arrayList);
        System.out.println();

        // LinkedList
        List linkedList = new LinkedList();
        linkedList.add("Dog");
        linkedList.add("Cat");
        linkedList.add("Elephant");
        System.out.println("LinkedList Elements: " + linkedList);
        System.out.println("Size of LinkedList: " + linkedList.size());
        System.out.println("First element: " + linkedList.get(0));
        linkedList.addAll(additionalElements);
        System.out.println("After adding additional elements: " +
linkedList);
        linkedList.remove("Cat");
        System.out.println("After removing 'Cat': " + linkedList);
        System.out.println("Contains Dog? :"+linkedList.contains("Dog"));
        linkedList.clear();
        System.out.println("After clearing the LinkedList: " + linkedList);
        System.out.println();

        // Vector
        List vector = new Vector();
        vector.add("One");
        vector.add("Two");
        vector.add("Three");
        System.out.println("Vector Elements: " + vector);
        System.out.println("Size of Vector: " + vector.size());
```

```
        System.out.println("Element at index 2: " + vector.get(2));
        vector.addAll(additionalElements);
        System.out.println("After adding additional elements: " + vector);
        vector.removeAll(additionalElements);
        System.out.println("After removing all additional elements: " +
vector);
        System.out.println("Contains One? :"+vector.contains("One"));
        vector.clear();
        System.out.println("After clearing the Vector: " + vector);
    }
}
```

Set interface :

```
package collections;

import java.util.HashSet;
import java.util.LinkedHashSet;
import java.util.Set;
import java.util.TreeSet;

public class SetDemo {

    public static void main(String[] args) {
        // Set interface
        System.out.println("Set Interface :");

        // HashSet
        Set<String> hashSet = new HashSet<>();
        hashSet.add("Apple");
        hashSet.add("Banana");
```

```
        hashSet.add("Cherry");
        System.out.println("HashSet Elements: " + hashSet);
        System.out.println("Size of HashSet: " + hashSet.size());
        System.out.println("Contains 'Banana': " +
hashSet.contains("Banana"));
        Set<String> additionalElements = new HashSet<>();
        additionalElements.add("Grapes");
        additionalElements.add("Pineapple");
        hashSet.addAll(additionalElements);
        System.out.println("After adding additional elements: " +
hashSet);
        hashSet.removeAll(additionalElements);
        System.out.println("After removing all additional elements: " +
hashSet);
        hashSet.clear();
        System.out.println("After clearing the HashSet: " + hashSet);
        System.out.println();

        // TreeSet
        Set<String> treeSet = new TreeSet<>();
        treeSet.add("Dog");
        treeSet.add("Cat");
        treeSet.add("Elephant");
        System.out.println("TreeSet Elements: " + treeSet);
        System.out.println("Size of TreeSet: " + treeSet.size());
        treeSet.addAll(additionalElements);
        System.out.println("After adding additional elements: " + treeSet);
        System.out.println();

        // LinkedHashSet
        Set<String> linkedHashSet = new LinkedHashSet<>();
        linkedHashSet.add("One");
        linkedHashSet.add("Two");
```

```
        linkedHashSet.add("Three");
        System.out.println("LinkedHashSet Elements: " + linkedHashSet);
        System.out.println("Size of LinkedHashSet: " +
linkedHashSet.size());
        System.out.println("Contains 'Two': " +
linkedHashSet.contains("Two"));
        linkedHashSet.addAll(additionalElements);
        System.out.println("After adding additional elements: " +
linkedHashSet);
        linkedHashSet.removeAll(additionalElements);
        System.out.println("After removing all additional elements: " +
linkedHashSet);
        linkedHashSet.clear();
        System.out.println("After clearing the LinkedHashSet: " +
linkedHashSet);
    }
}
```