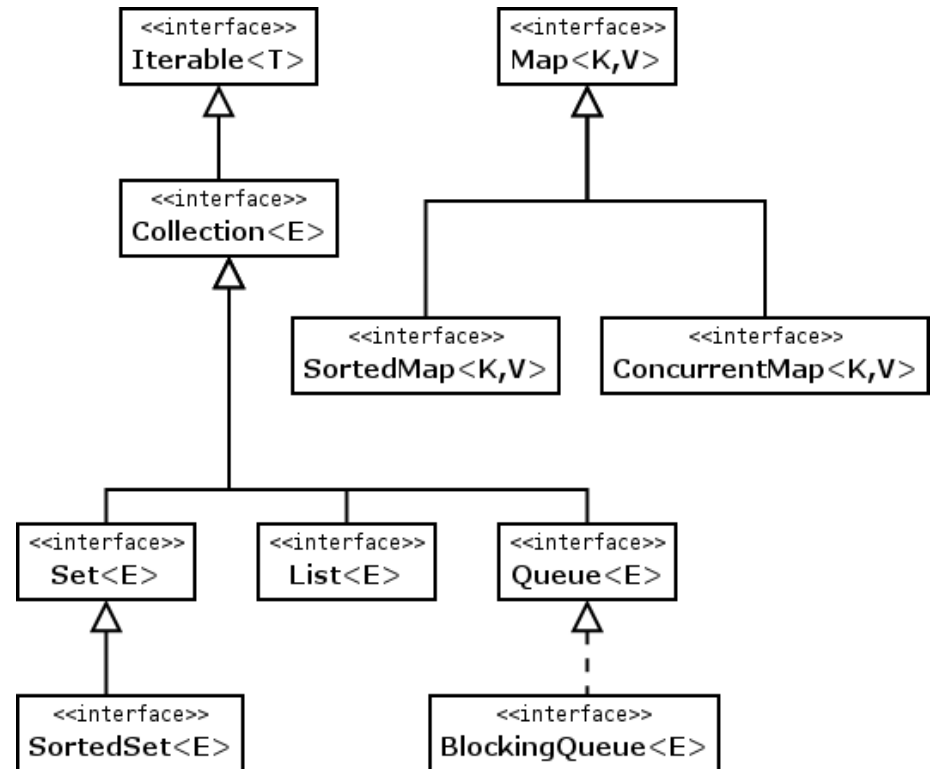


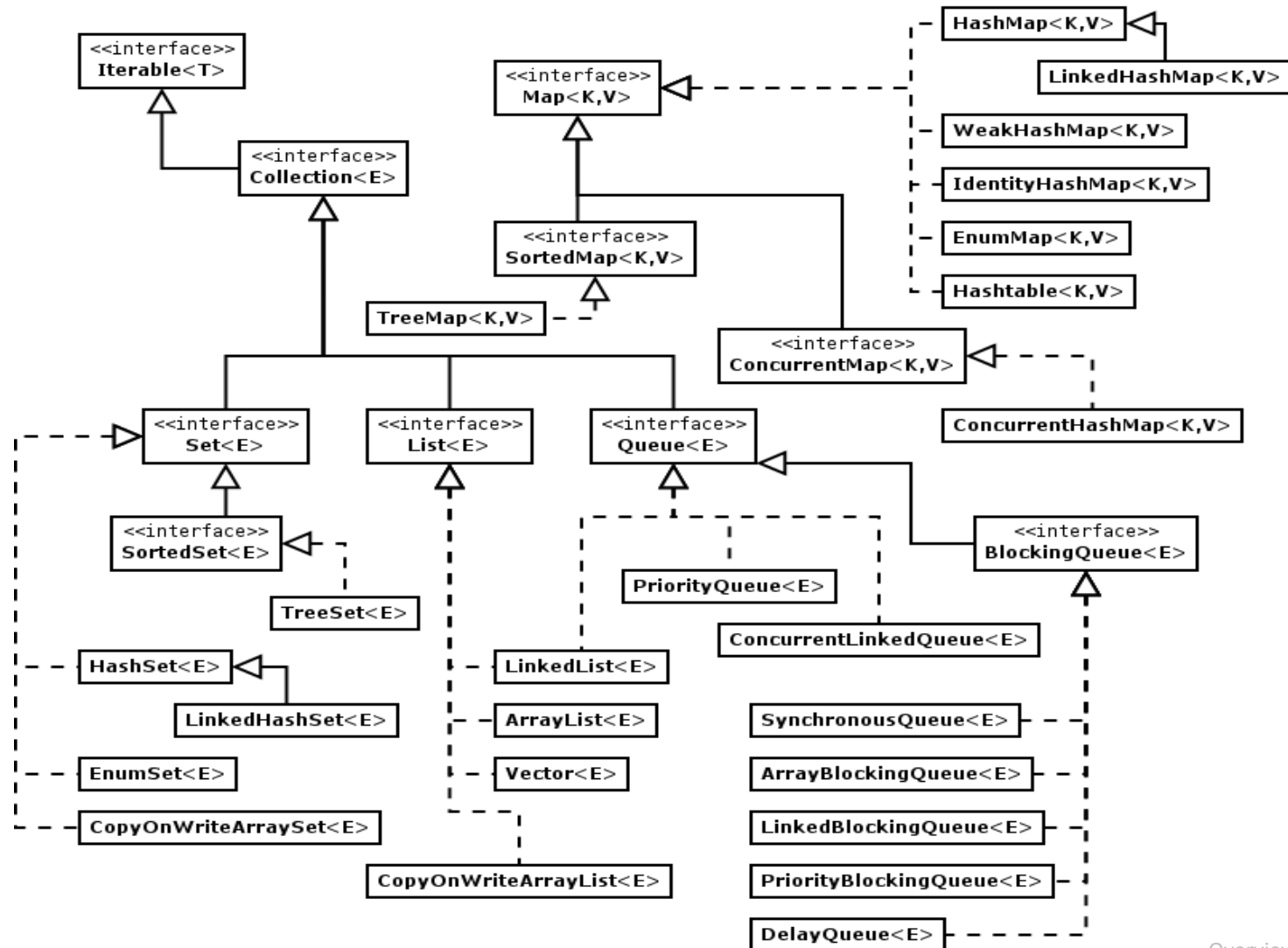
Java Collections

- a **Collection** is a container that groups multiple elements into a single unit
- the Java **Collection** framework (JCF) is one of the most important ones in all of Java's libraries, providing high performance implementations
- it uses generics to be flexible w.r.t. element types contained, and it is also **polymorphically structured**, so the same methods work on different collections

Interfaces of the Collections Framework



The Collections Framework



HashMap Interlude

Example Usage: The List<T> Interface

```
import java.util.*;
```

import of the
right package

```
class ListWorld {  
    static void printList(List<Robot> list) {  
        System.out.print("List is:");  
        for (Robot robot : list) {  
            System.out.print(robot.name+',');  
        }  
        System.out.println("");  
    }  
}
```

simple
for-loop
to iterate
through
the set

construct
list
object
(with type
inference)

```
public static void main(String args[]) {  
    List<Robot> list = new ArrayList<>();  
    Robot c3po = new Robot("C3PO");  
    list.add(c3po);  
    list.add(new CarrierRobot());  
    printList(list);  
    list.add(1, new Robot("C4PO"));  
    printList(list);  
    Robot removed = list.remove(2);  
    System.out.println("Removed:" +  
        removed.name);  
    printList(list);  
    System.out.println("C3PO in list?:" +  
        list.contains(c3po));  
    list.addAll(0, list);  
    printList(list);  
} }
```

adding
elements

element removal

«interface»
List<E>

```
+ boolean add(int index, E)  
+ boolean addAll(int index, Collection<E>)  
+ void clear()  
+ boolean contains(Object o)  
+ boolean containsAll(Collection c)  
+ E get(int index)  
+ int indexOf(Object)  
+ int lastIndexOf(Object)  
+ E remove(int index)  
+ E set(int index, E)  
+ Iterator<E> iterator()  
+ ListIterator<E> listIterator()  
+ List<E> subList(int fromIndex, int toIndex)  
+ int size()  
+ boolean isEmpty()
```

List is:C3PO,Standard Model,
List is:C3PO,C4PO,Standard Model,
Removed:Standard Model
List is:C3PO,C4PO,
C3PO in list?:true
List is:C3PO,C4PO,C3PO,C4PO