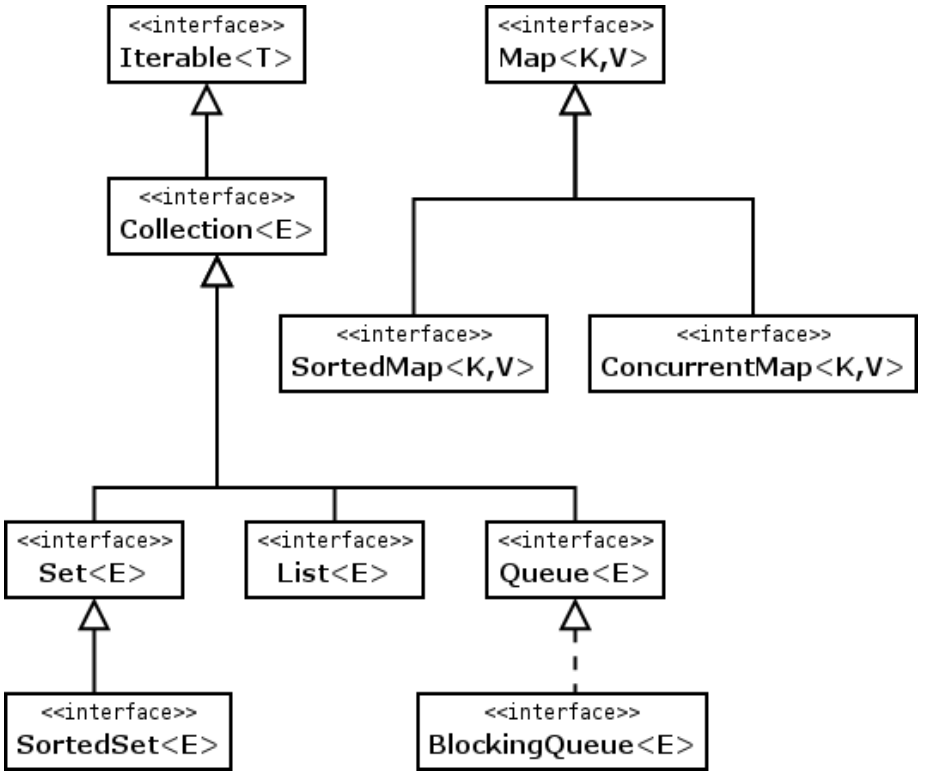
Java Collections

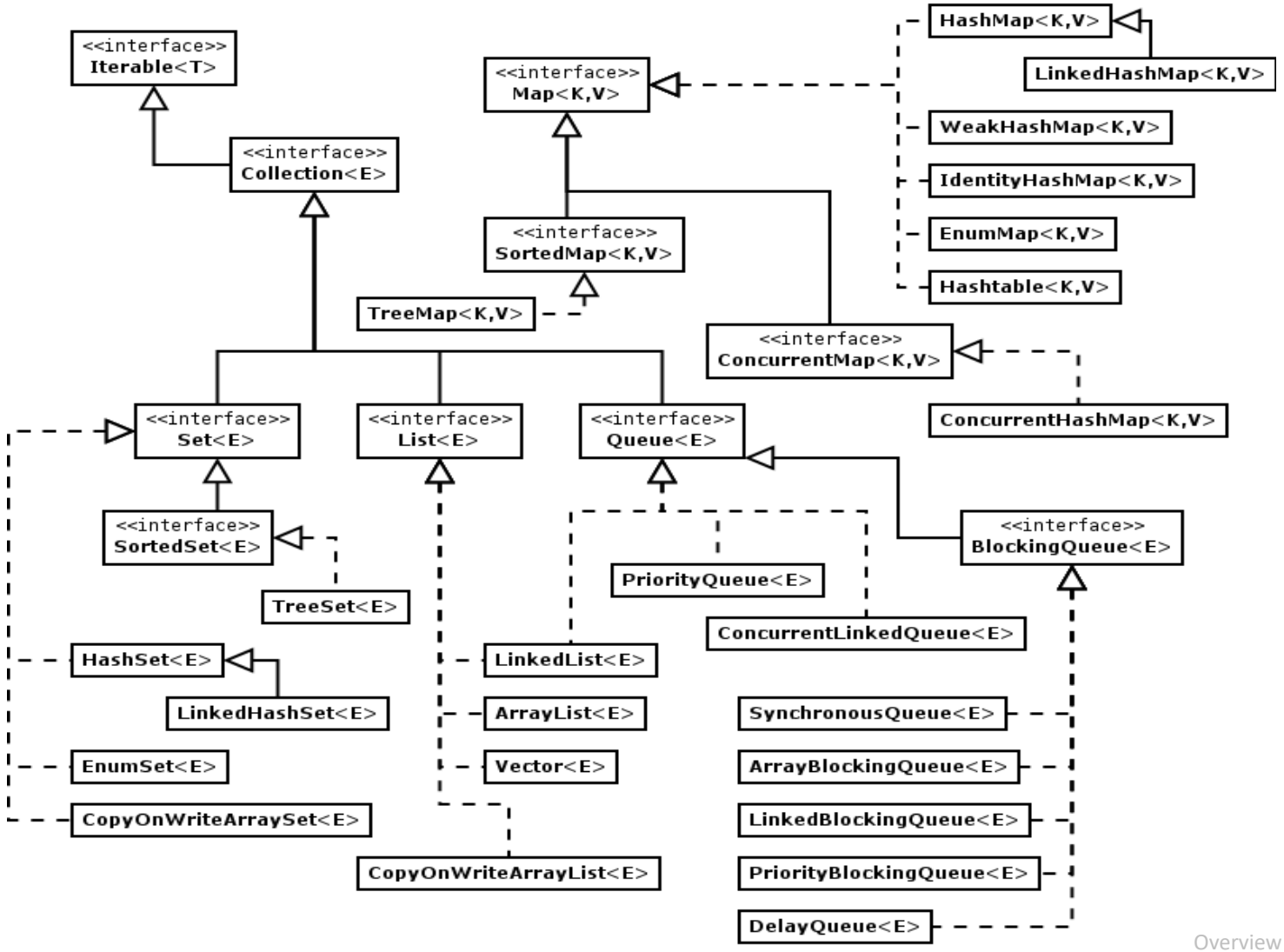
- a **`Collection`** is a container that groups multiple elements into a single unit
- the Java **`Collection`** framework (JCF) is one of the most important ones in all of Java's libraries, providing high performance implementations
- it uses generics to be flexible w.r.t. element types contained, and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

Interfaces of the Collections Framework



Overview by Ray Toal

The Collections Framework



Overview by Ray Toal

HashMap Interlude

Example Usage: The List<T> Interface

```
import java.util.*;

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("");
  }

  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);
} }
```

import of the right package

simple for-loop to iterate through the set

construct list object (with type inference)

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,
```