Java Collection Framework

The Collection Framework in Java provides a set of classes and interfaces to store and manipulate data.

It is part of the java.util package and supports dynamic data structures like lists, sets, maps, and queues.

Key Components:

1. Interfaces:

   - Collection: The root interface of the framework.
   - List: Ordered collection, allows duplicates (e.g., ArrayList, LinkedList).
   - Set: Unordered collection, no duplicates (e.g., HashSet, TreeSet).
   - Queue: Used to hold elements for processing (FIFO), e.g., PriorityQueue.
   - Map: Collection of key-value pairs (e.g., HashMap, TreeMap).

2. Classes:

   - ArrayList: Resizable array, implements List.
   - LinkedList: Doubly linked list, implements List, Queue.
   - HashSet: Hash table for storing unique elements, implements Set.
   - TreeSet: Sorted set implementation.
   - HashMap: Hash table-based Map implementation.
   - TreeMap: Sorted map implementation.

3. Key Methods:

- add(): Adds an element.
- remove(): Removes an element.
- contains(): Checks if the collection contains an element.
- size(): Returns the size of the collection.
- iterator(): Returns an iterator for traversal.

Example (ArrayList usage):

```
import java.util.ArrayList;
import java.util.List;

public class CollectionExample {
    public static void main(String[] args) {
        List<Integer> numbers = new ArrayList<>();

        // Adding elements
        numbers.add(10);
        numbers.add(20);
        numbers.add(30);

        // Removing an element
        numbers.remove(Integer.valueOf(20));

        // Iterating over the list
        for (int number : numbers) {
            System.out.println(number);
        }


        // Checking size

        System.out.println("Size: " + numbers.size());

    }

}
```