Java List

In this tutorial, we will learn about the List interface in Java and its methods.

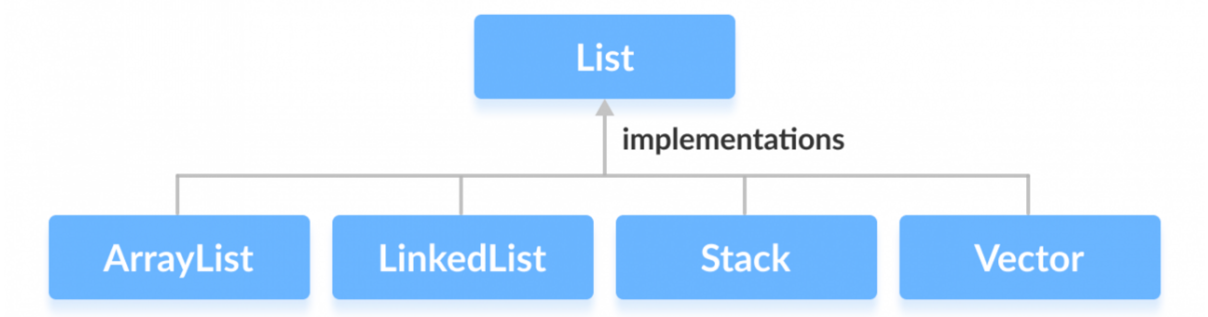
In Java, the `List` interface is an ordered collection that allows us to store and access elements sequentially. It extends the `Collection` interface.

Classes that Implement List

Since `List` is an interface, we cannot create objects from it.

In order to use functionalities of the `List` interface, we can use these classes:

- ArrayList
- LinkedList
- Vector
- Stack



These classes are defined in the Collections framework and implement the `List` interface.

How to use List?

In Java, we must import `java.util.List` package in order to use `List`.

```
// ArrayList implementation of List
List<String> list1 = new ArrayList<>();

// LinkedList implementation of List
List<String> list2 = new LinkedList<>();
```

Here, we have created objects `list1` and `list2` of classes `ArrayList` and `LinkedList`. These objects can use the functionalities of the `List` interface.

Methods of List

The `List` interface includes all the methods of the `Collection` interface. Its because `Collection` is a super interface of `List`.

Some of the commonly used methods of the `Collection` interface that's also available in the `List` interface are:

- `add()` - adds an element to a list
- `addAll()` - adds all elements of one list to another
- `get()` - helps to randomly access elements from lists
- `iterator()` - returns iterator object that can be used to sequentially access elements of lists
- `set()` - changes elements of lists
- `remove()` - removes an element from the list
- `removeAll()` - removes all the elements from the list

- `clear()` - removes all the elements from the list (more efficient than `removeAll()`)
- `size()` - returns the length of lists
- `toArray()` - converts a list into an array
- `contains()` - returns `true` if a list contains specified element

Implementation of the List Interface

1. Implementing the ArrayList Class

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

class Main {

    public static void main(String[] args) {
        // Creating list using the ArrayList class
        List<Integer> numbers = new ArrayList<>();

        // Add elements to the list
        numbers.add(1);
        numbers.add(2);
        numbers.add(3);
        System.out.println("List: " + numbers);

        // Access element from the list
        int number = numbers.get(2);
        System.out.println("Accessed Element: " + number);

        // Remove element from the list
        int removedNumber = numbers.remove(1);
        System.out.println("Removed Element: " + removedNumber);
    }
}
```

Output

```
List: [1, 2, 3]
Accessed Element: 3
Removed Element: 2
```

To learn more about `ArrayList`, visit Java ArrayList.

2. Implementing the LinkedList Class

```java
import java.util.List;
import java.util.LinkedList;

class Main {

    public static void main(String[] args) {
        // Creating list using the LinkedList class
        List<Integer> numbers = new LinkedList<>();

        // Add elements to the list
        numbers.add(1);
        numbers.add(2);
        numbers.add(3);
        System.out.println("List: " + numbers);

        // Access element from the list
        int number = numbers.get(2);
        System.out.println("Accessed Element: " + number);

        // Using the indexOf() method
        int index = numbers.indexOf(2);
        System.out.println("Position of 3 is " + index);

        // Remove element from the list
        int removedNumber = numbers.remove(1);
        System.out.println("Removed Element: " + removedNumber);
    }
}
```

Output

```
List: [1, 2, 3]
Accessed Element: 3
Position of 3 is 1
Removed Element: 2
```

To learn more about `LinkedList`, visit Java LinkedList.

Java List vs. Set

Both the `List` interface and the `Set` interface inherits the `Collection` interface. However, there exists some difference between them.

- Lists can include duplicate elements. However, sets cannot have duplicate elements.
- Elements in lists are stored in some order. However, elements in sets are stored in groups like sets in mathematics.

Now that we know what `List` is, we will see its implementations in `ArrayList` and `LinkedList` classes in detail in the next tutorials.