**ArrayList in Java | ArrayList Methods, Example**

**ArrayList in Java** is a resizable array that can grow or shrink in the memory whenever needed. It is dynamically created with an initial capacity.

It means that if the initial capacity of the array is exceeded, a new array with larger capacity is created automatically and all the elements from the current array are copied to the new array.

Elements in ArrayList are placed according to the zero-based index. That is the first element will be placed at 0 index and the last element at index (n-1) where n is the size of ArrayList.

Java ArrayList uses a dynamic array internally for storing the group of elements or data.

The capacity of ArrayList does not shrink automatically. When elements are removed from the list, the size of array list can be shrunk automatically but not capacity.

**Random Access Interface**

1. RandomAccess Interface is a marker interface that does not define any method or member. It is introduced in Java 1.4 version for optimizing the list performance.

2. RandomAccess interface is present in java.util package.

3. ArrayList class implements a random access interface so that we can access any random element at the same speed. For example, suppose there is a group of one crore objects in the array list.

**Serializable Interface**

1. A serializable interface is a marker interface that is used to send the group of objects over the network. It is present in the java.io package.

2. It helps in sending the data from one class to another class. Usually, we use collections to hold and transfer objects from one place to another place.

To provide support for this requirement, every collections class already implements Serializable and Cloneable.

**Cloneable Interface**

1. A cloneable interface is present in java.lang package.

2. It is used to create exactly duplicate objects. When the data or group of objects came from the network, the receiver will create duplicate objects.

The process of creating exactly duplicate objects is known as cloning. It is a very common requirement for collection classes.

## Features of ArrayList in Java

**1. Resizable-array:** ArrayList is a resizable array or growable array that means the size of ArrayList can increase or decrease in size at runtime. Once ArrayList is created, we can add any number of elements.

2. **. Index-based structure:** It uses an index-based structure in java.

**3. Duplicate elements:** Duplicate elements are allowed in the array list.

**4. Null elements:** Any number of null elements can be added to ArrayList.

**5. Insertion order:** It maintains the insertion order in Java. That is insertion order is preserved.

**6. Heterogeneous objects:** Heterogeneous objects are allowed everywhere except TreeSet and TreeMap. Heterogeneous means different elements.

**7. Synchronized:** ArrayList is not synchronized. That means [multiple threads](https://www.scientecheasy.com/2020/08/creating-multiple-threads-in-java.html/) can use the same ArrayList objects simultaneously.

**8. Random Access:** ArrayList implements random access because it uses an index-based structure. Therefore, we can get, set, insert, and remove elements of the array list from any arbitrary position.

**9. Performance:** In ArrayList, manipulation is slow because if any element is removed from ArrayList, a lot of shifting takes place.

For example, if an array list has 500 elements and we remove 50th elements then the 51st element will try to acquire that 50th position, and likewise all elements. Thus, it consumes a lot of time-shifting.

## Java ArrayList Constructor

Java ArrayList class provides three constructors for creating an object of ArrayList. They are as:

* ArrayList()
* ArrayList(int initialCapacity)
* ArrayList(Collection c)

Creating an object of ArrayList class in Java is very simple. First, we will declare an array list variable and call the array list constructor to instantiate an object of ArrayList class and then assign it to the variable.

We can create an object of ArrayList class in java by using any one of three constructors. Let’s see one by one.

1. The syntax for creating an instance of ArrayList class is as:

ArrayList al = new ArrayList();