

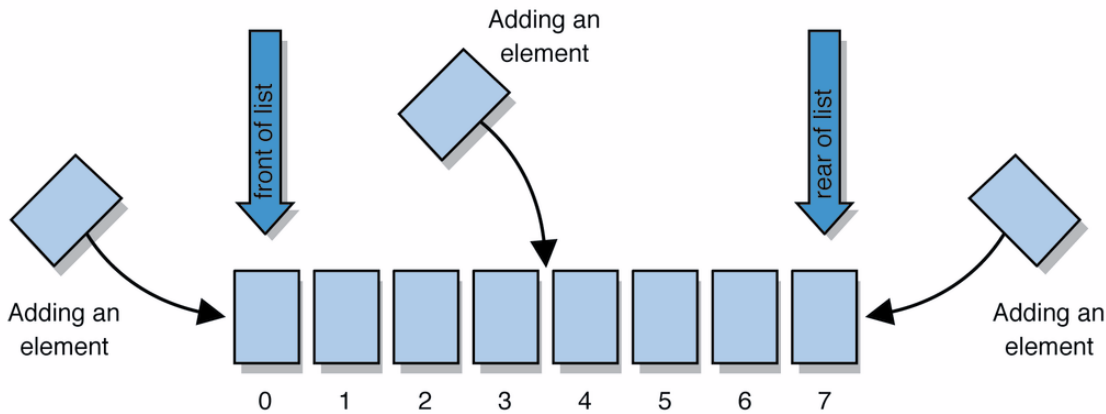
AP CS: Lesson 18: ArrayLists

Name: _____ Period: _____

ArrayList: (BJP Chapter 10)

list: a collection storing an ordered sequence of elements

- each element is accessible by a 0-based **index**
- a list has a **size** (number of elements that have been added)
- elements can be added to the front, back, or elsewhere
- in Java, a list can be represented as an **ArrayList** object



Required Library for these: (placed above the Class creation)

```
import java.util.*; // required for Arrays
```

Array Creation and use:

```
ArrayList<Type> name = new ArrayList<Type>();  
name.add("Your Name"); // Assigning a value to the end of an ArrayList name  
public static type methodName(ArrayList<Type> name) { // ArrayList as a parameter  
public static ArrayList<Type> methodName(parameters) { // returning an ArrayList  
methodName(arrayListName); //calling a method with an ArrayList as its parameter  
ArrayList<String> names = methodName(parameters); // ArrayList as returned value
```

Examples:

```
ArrayList<String> names = new ArrayList<String>(); // an ArrayList of Strings  
public static void actOnIt(ArrayList<String> input) {} // ArrayList parameter  
// returning a boolean ArrayList, using "Integer" as the wrapper for int  
public static ArrayList<Integer> figureItOut(int x, int y) {}  
actOnIt(names); // calling a method with an array as its parameter  
ArrayList<Integer> values = figureItOut(x, y); // ArrayList as a returned value
```

ArrayList Size Method:

```
name.size() // returns the integer size of an ArrayList, includes parenthesis
```

Examples:

```
ArrayList<Integer> list = new ArrayList<Integer>(); // Creates ArrayList of int's  
for (int i = 1; i <= 10; i++) {  
    list.add(10 * i); // Result [10, 20, 30, 40, ..., 100]  
}  
for (int i = 0; i < list.size(); i++) { // for loop going through an ArrayList  
    ... // NOTE: that the size() may change based on what goes on in the loop.  
} // one by one element at a time
```

AP CS: Lesson 18: ArrayLists

Key ArrayList Methods: (where `a` is an ArrayList Object, see more in the Java API)

```
a.add(value) // appends value at end of list
a.add(index, value) // inserts given value just before the given index,
a.shifting // subsequent values to the right
a.clear() // removes all elements of the list
a.indexOf(value) // returns first index where given value is found in list
                // (-1 if not found)
a.get(index) // returns the value at given index
a.remove(index) // removes & returns value at given index,
                // shifting subsequent values to the left
a.set(index, value) // replaces value at given index with given value
a.size() // returns the number of elements in list
a.toString() // returns a string representation of the list such as "[3, -7, 15]"
a.addAll(list) OR a.addAll(index, list) // adds all elements from the given list
                // to this list (at the end of the list, or inserts them at the given index
a.contains(value) // returns true if given value is found somewhere in this list
a.containsAll(list) // returns true if this list contains every element
                // from given list
a.equals(list) // returns true if given other list contains the same elements
a.lastIndexOf(value) // returns last index value of value found in list
                // (-1 if not found)
a.remove(value) // finds and removes the given value from this list
a.removeAll(list) // removes any elements found in the given list from this list
a.retainAll(list) // removes any elements not found in given list from this list
a.subList(from, to) // returns the sub-portion of the list between indexes
                // from (inclusive) and to (exclusive)
a.toArray() // returns the elements in this list as an array
```

Class Notes: