

## Lab 6.1 – Implement an ArrayList in Java

### Learning Goals

- 1) Develop your understanding of objects in Java.
- 2) Develop your understanding of the List and ArrayList functionality in Java.
- 3) Develop your ability to implement an array list.

### Background

Java provides a powerful List interface with both ArrayList and LinkedList implementations.

Wonderfully, we can store anything in a List, with little fuss. For this assignment, our list will store Object references. (The language supports a concept called generics, beyond the scope of this assignment, which adds type safety to flexibility already provided.)

### Your Task

For this assignment, the interface **bca.util.BCArrayList** has been defined, closely mirroring the **java.util.List** interface of Java.

Your task is to implement **BCAArrayList**, which is an array list implementation of **BCArrayList**.

**BCAArrayList** should:

1. Have the following two private instance variables:
  - a. `Object[] array`
  - b. `int listSize`
2. Have a constructor which initializes “array” and “listSize”.
3. Implement **private void expand()** which will expand “array” in a very similar manner to the C version.
4. Implement all of the methods defined in **BCArrayList**. (It won’t compile otherwise!)

Specifications for the methods are provided in **bca.util.BCArrayList**.

### Testing

Two classes have been provided for testing:

- 1) **StateCapitalQuiz** demonstrates the flexibility to store any type of object in a list. Run the quiz and verify that it behaves as expected.
- 2) **bca.util.BCArrayListTest** provides a fairly exhaustive set of test cases to verify the accuracy of your implementation.