

# In-Class Activity #9

Due Time 11:59 PM

The objective of this activity is to implement two list-based data structures. `ArrayBasedList` and `LinkedList` using a provided `ListADT` interface. You will complete the implementation of two classes: `ArrayBasedList`, which uses a simple array as its underlying data structure, and `LinkedList`, which utilizes a singly linked list to store elements. Both classes must fully implement the methods defined in the `ListADT` interface, ensuring they adhere to the expected behavior as specified in the interface documentation.

## Specifications:

You are provided with the following files:

- `ListADT.java`: A fully implemented interface defining the required abstract methods. Since `ArrayBasedList` and `LinkedList` implement this interface, they **must not** be declared abstract and must provide full implementations of all required methods.
- `ArrayBasedList.java`: A skeleton code for the `ArrayBasedList` class with full implementation of `print`, `getIndex` methods along with an array `resize` helper method. **You may change these methods as you see fit.**
- `LinkedList.java`: A skeleton code for the `LinkedList` class with full implementation of `print`, `getIndex` methods along with a `getNode` helper method. **You may change these methods as you see fit.**
- `Node.java`: A fully implemented class representing a node in a singly linked list, containing a `value` field and a reference to the `next` node. **Do not modify this file.**
- `Driver.java`: A fully implemented class for testing purposes. **Do not modify this file.**

## Requirements:

- Before you start coding, carefully read through the provided code to understand the `ListADT` interface and the `Driver` class.
- For both `ArrayBasedList` and `LinkedList` classes, implement the `add`, `remove` and `clear` methods according to the comments provided in the skeleton code and the `ListADT` interface.
- If your implementation is correct, running the provided test cases in the `Driver` class will produce the following expected output:

```
List Contents: Cheese,Bread,Milk,Beef
Removed: Cheese
List Contents: Bread,Milk,Beef
Milk
List Contents:
Removed:
Index 1 is out of bounds.
*****
List Contents: Cheese,Bread,Milk,Beef
Removed: Cheese
List Contents: Bread,Milk,Beef
Milk
List Contents:
Removed:
Index 1 is out of bounds.
*****
```

**After thoroughly testing your code, Submit a screenshot of the output along with the ArrayBasedList.java , LinkedList.java files to the assigned DropBox on Brightspace by 11:59 PM**