Data Structure and Algorithms
Workshop – Implementing a Link List

Objectives

- Understanding the List ADT.
- Understanding the Linked List data structure.
- Implementing the List ADT using Linked Lists.

Introduction

List is one of the most common and important ADTs. Two popular implementation is using Array or Linked List. The goal of this workshop is to gain experience working with Linked List by implementing a subset of methods from the List ADT, using Linked List as the underlying data structure.

Exercises

The List ADT to be implemented should be able to contain a **collection of strings**. You are asked to implement the following methods:

Add(string newElement): Adds the specified element to the end of this list.

Insert(int index, string newElement): Inserts the specified element at the specified position in this list.

GetAt(int index): Return the element at the specified index.

RemoveAt(int index): Removes the element at the specified index of the list.

Count(): Gets the number of elements contained in the list.

Replace(int index, string newElement): Replace with the new element at the specified index.

Contains(string element): Determines whether an element is in this list.

Test your implementation.

For advanced students: What is the time efficiency for operation *Add(string newElement)*? Change the implementation to make it ***O(1)***.