

Data Structures and Algorithms

Assignment 01

Linear Data Structures

Submission Deadline:
Thursday, 04-April-2024, 11:59 PM

1. Modify the Doubly Linked List code (**DoublyLinkedList.c**) provided with this assignment to implement a Singly Linked List (which contains only the **next** pointer).

Submit the solution as **01_SinglyLinkedList.c**

2. Implement the Queue operations using the Singly Linked List implementation.

Submit the solution as **02_Queue_SLL.c**

3. Using a Doubly Linked List, perform polynomial addition. There is a code provided with this assignment (**DLL_Polynomial.c**) which shows how to represent polynomials using a linked list.

For example, two polynomials

P1: $5x^3 + 4x^2 + 6x^1$

P2: $6x^5 + 3x^2 + 4x^1$

were stored and the addition result we expect is

P3: $6x^5 + 5x^3 + 7x^2 + 10x^1$

Your code should work for any arbitrary polynomials which when hardcoded in the main function must produce the new polynomial.

Submit the solution as **03_DLL_PolynomialAddition.c**

4. Read and understand about converting a given Infix expression to a Postfix expression from the following link:

<https://www.geeksforgeeks.org/convert-infix-expression-to-postfix-expression/>

Using the Doubly Linked List implementation of Stack, solve the Infix to Postfix expression. Refer to the C implementation using arrays from the above link to understand how the input and output should be handled.

Submit the solution as **04_InfixToPostfix.c**

Note:

- Collate all the submission files inside a single folder named **DSA_Assignment_01** and submit the folder in zip format (**DSA_Assignment_01.zip**).