Department of Information Technology
IT2102-Data Structures & Algorithm
Assignment No. 1

Submission Deadline: 04 October 2023

1. Write the recursive pseudo code and recursive program using C for "Tower of Hanoi" problem. Explain your solution for three disc using recursive steps/recursive tree.

2. Write the program and algorithm to add two polynomials using linked list. Explain with an example.

3. Write pseudo code to delete *n* nodes after every *m* node in the singly linked list. For example:
   Input: *m* = 3, *n* = 2
   Linked List: 1->2->3->4->5->6->7->8->9->10
   Output: Linked List: 1->2->3->6->7->8

4. Write the pseudo code and program using C to reverse first *k* elements of a queue.

5. Write a program to reverse a linked list using optimal number of additional variables.

6. A single array A [1...MAXSIZE] is used to implement two stacks. The two stacks grow from opposite ends of the array. Variables top1 and top2 (top1< top2) point to the location of the topmost element in each of the stacks. If the space is to be used efficiently, then analyse and write the condition for "stack full". Test your condition by taking an example.

7. If the input sequence is 5, 4, 3, 2, 1 then identify the wrong stack permutation (possible pop sequence) among following options? Show all the steps to identify the options.

   a) 4, 2, 1, 3, 5 b) 5, 2, 3, 4, 1
   c) 4, 5, 1, 2, 3 d) 3, 4, 5, 2, 1