Indian Institute of Technology, Jodhpur

Bridge Course on DSA

(Session: 2022-23)

Assignment 1

Instructions:

- The score points are assigned at the respective question
- You are required to attempt all questions
- Answers need to be succinct and in your own words
- Verbosity is undesirable
- Please submit the solution within provided deadline
- Plagiarism will not be tolerated. If plagiarism detected, zero marks will be awarded for the entire assignment

1. Write a program to create a:
    a. A singly linked list (using structures and pointers)
    b. A doubly linked list (using structures and pointers)
    c. A circular linked list (using structures and pointers)
2. Write a program to:
    d. Reverse a singly linked list
    e. To remove the nth node from the linked list (value of n should be entered by user)
3. Write a program to:
    f. To remove duplicate elements from a sorted linked List
    g. To delete k nodes after n nodes of a linked list
    h. Merge two linked lists at alternate positions

4. Write a program to implement a Stack (using Structures and Pointers).

5. Create a Queue, Deque, Circular Queue, Priority Queue in C (Using Structures and Pointers).

6. Create a Binary Search Tree in C (Using Structures and Pointers) and also create a Binary Search Tree in C++, JAVA, Python (Using Classes and Objects)

7. The task is to implement a queue using instances of stack data structure and operations on them.

A. Constructor for the MyStack class is MyStack(). Create a blank array of type T.
B. Push the value onto the stack using the void push(T value) function. If the internal array is full, resize.
C. T pop() throws an empty stack exception: Remove the top element from the stack and return it. The stated exception must be thrown if the stack is empty.
D. T is Empty() boolean function returns true if the stack is empty and false otherwise.