## **Data Structures and Algorithms**

## MC 124

#### Lab 8

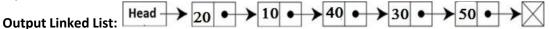
# May 25, 2022

- **Q.1** Write the code for the following problems through Recursion:
  - a. Reverse the linked list through the recursion.
  - b. Find Fibonacci series of length n
  - c. Count the sum of the digits of a given number
- **Q.2** Implement a stack using queues (only 2 queues). The implemented stack should support all the functions of a normal stack (push, top, pop, and empty).
- Q.3 Write function(s) to multiply each data of the stack with X and store the elements in a linked list (insert at head) as shown in figures below.

## **Input Stack:**

5	
3	
4	
1	
2	

#### Input X=10



**Q.4** For any mathematical equation to run successfully, the parenthesis plays a vital role in its solution. For long equations, there are the chances of the misplaced brackets or missing brackets. Being a futuristic potential engineer, design a parenthesis balance checking program.

For eg.:  $[(A+B)-(C+D)] \rightarrow Unbalanced$   $[A+B(C+D(E+G)] \rightarrow Unbalanced$  $[A+\{B+(C+D)+E\}+F] \rightarrow Balanced$ 

**Q.5** Accept the evaluation formula string from user and evaluate the formula using stack.

For eg.: Input: (1+(2\*3)-5)

Output: 2

**Hint**: You may use infix or postfix expression for the solution