Data Structures and Algorithms
CS-F22
LAB-01

Issue Date: June 28,2024

Start Time: 8:15 AM
Completion Time: 11:15 M

Total Marks : 40

Objective:

In this lab, students will understand about singly and doubly linked list working. The objective is to reinforce understanding of different functionalities performed by singly and doubly linked lists.

Instructions:

1) Follow the question instructions very carefully, no changes in function prototypes are allowed.
2) Your laptops must be on airplane mode.
3) Anyone caught in an act of plagiarism would be awarded an "F" grade in this Lab.

TASK 01: Reverse a singly linked list [10 Marks]

Given a singly linked list, you have to reverse that singly linked list and return the head of that updated list. Function prototype should be: **Node * reverseSinglyLinkedList(Node * head);**

Sample run:
Input: 3->7->19->2->10
Output: 10->2->19->7->3

TASK 02: Rearrange singly linked list in a zigzag fashion [20 Marks]

Given a singly linked list, rearrange it such that the converted list should be of the form a < b > c < d > e < f… Where a, b, c … are consecutive data nodes of the linked list.
Function prototype: **void zigzagList(Node * head);**

Sample run:
Input: 11->15->20->5->10
Output: 11->20->5->15->10

TASK 03: Remove the Nth Node from the end of a doubly linked list [10 Marks]

Given a doubly linked list, delete nth node from the end.

Function prototype: **void deleteNthNodeFromTheEnd(node * head, int n);**

Sample run:
Input:
List: A -> B -> C -> D -> E -> F
N = 3
Output:
List: A -> B -> C -> E -> F