Sardar Vallabhbhai National Institute of Technology, Surat
Department of Artificial Intelligence
Data Structure (AI102)
B.Tech I - II Semester

Assignment-4

Write C/C++ program for the following

Q1: Given a linked list of n nodes and an integer k, write a function to rotate the linked list counter clockwise by k nodes.

Q2: Given an unsorted linked list of n nodes, remove duplicates from the list.

Q3: Given a singly linked list of n nodes, detect if it contains a loop or not.

Q4: Write a C/C++ program to implement **doubly linked list** with the following function

(i) insertAtFirst(&head, new_data): This function should insert the new data/element at the beginning of the linked list.

(ii) insertAtEnd(&head, new_data): This function should insert the new data/element at the end of the linked list

(iii) insertAtMiddle(&head, new_data): This function should insert the new data/element at the middle of the linked list

(iv) insertAfterNode(&head, given_node, new_data): This function should insert the new data/element after the given node in the linked list.

Example: Suppose, you want to insert 60 after node 40 in the given linked list 10 ←→ 20 ←→ 30 ←→ 40 ←→ 50, the updated linked list will be 10 ←→ 20 ←→ 30 ←→ 40 ←→ 60 ←→ 50\

(v) display(&head): This function should display the content of the linked list

Note:

1. If the linked list has 4 elements, let's say 10, 20, 30, and 40, the linked list should be displayed in the following format 10←→20←→30←→40

2. After each operation, you should display the content of the linked list.