**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**NITK – Surathkal**

# CS204: Data Structures and Algorithms Lab

# Assignment - 3

**Instructions:**

1. Implement the following exercise using C.
2. You are required to complete this exercise on or before 19/10/2021.
3. Submit all the programs in a single *.zip* file.

**Exercise:**

1. Create a singly linked list and implement the following operations:
   1. Insert node at the front.
   2. Insert node at the end.
   3. Insert node at a specified position
   4. Delete node at the front.
   5. Delete node at the end.
   6. Delete node at a specified position
   7. Traverse the list and print the elements of the list.
2. Create a doubly linked list and implement the following operations:
   1. Insert node at the front.
   2. Insert node at the end.
   3. Insert node at a specified position
   4. Delete node at the front.
   5. Delete node at the end.
   6. Delete node at a specified position.
   7. Traverse the list and print the elements of the list.
3. Create a circular linked list and implement the following operations:
   1. Insert node at the front.
   2. Insert node at the end.
   3. Insert node at a specified position.
   4. Delete node at the front.
   5. Delete node at the end.
   6. Delete node at a specified position.
   7. Traverse the linked list and print the elements of the list.
4. Create a circular doubly linked list and implement the following operations:
   1. Insert node at the front.
   2. Insert node at the end.
   3. Insert node at a specified position
   4. Delete node at the front.
   5. Delete node at the end.
   6. Delete node at the a specified position
   7. Traverse the linked list and print the elements of the list.
5. Write a program to add two polynomials using Linked list.
6. Write a program to count the number of nodes in a given linked list.
7. Write a program to merge two sorted linked lists.
8. Write a program to concatenate two linked lists.
9. Write a program to reverse a linked list using:
   1. Iterative approach
   2. Recursive approach
10. Write programs to compare two linked lists:
    1. Check if elements and arrangements are same in both the linked lists
    2. Check if only elements are same.