DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
NITK – Surathkal

CS203: Data Structures and Algorithms Lab
Assignment - 4

Instructions:

1. Implement the following exercise using C.
2. You are required to complete this exercise on or before 11/09/2024.
3. Submit all the programs in a single *.zip* file.

Exercise:

1. Write a program to implement the stack using
    a. Arrays.
    b. Linked Lists

   The programs should include functions to perform the following operations:

   Push: Inserts an element to the top of the stack.

   Pop: Deletes an element from the top of the stack.

   Disply: Displays all the elements of the stack.

2. Write a program to convert an infix expression to equivalent
   (i) postfix expression.
   (ii) prefix expression using stack
3. Write a program to evaluate the postfix expression.
4. Write a program to check the balanced brackets/parenthesis in an expression using stack.
5. Write a program to implement the circular queue using
    a. Arrays.
    b. Linked Lists

   The program should include functions to perform the following operations:

   Enqueue: Inserts an element to the end of the queue

   Dequeue:Removesanelementfromthefrontofthequeue

   Display: Displays all the elements of the queue

6. Write a program to implement the stack using queues
7. Write programs to implement the following sorting algorithms. For each of the sorting methods,count the number of comparisons required to sort.
    a. Insertion sort
    b. Merge sort
    c. Quick sort
    d. Bucket sort
    e. Radix sort

8. Write programs to implement the following searching algorithms

a. Linear search b. Binary search