Assignment 3

Indian Institute of Technology, Roorkee
Programming Lab (CS-504)

Autumn Semester

Problem Statement 1

Given a string containing just the characters '(' and ')', find the length of the longest valid (well-formed) parentheses substring.

Note: Time Complexity of the program should not exceed O(n^2). n is the length of the string s
Examples:

1. • Input: s = "(()"
   • Output: 2
   • Explanation: The longest valid parentheses substring is "()".
2. • Input: s = ")()())"
   • Output: 4
   • Explanation: The longest valid parentheses substring is "()()".

Constraints:

- s[i] is '(', or ')'.

Problem Statement 2

Write a C++/Java function to delete the bottom element of the stack.

Problem Statement 3

Write a C++/Java program to partially reverse the linked list depending upon n (< length of linked list).

[Hint: If n=2 and A=1 3 6 8 9 2 10 then output will be B=3 1 8 6 2 9 10 and if n=3 then A becomes B=6 3 1 2 9 8 10].

Problem Statement 4

You are given k linked lists, each linked-list is sorted in ascending order. Merge all the linked-lists into one sorted linked-list and return it.

Note: Time complexity should not exceed O(kN) where N is the number of nodes in the final linked list

Examples:

1.
   - If The linked-lists are:
     $[1->4->5, 1->3->4, 2->6]$
   - Merging them into one sorted list:
     $1->1->2->3->4->4->5->6$

Problem Statement 5

Write a C++/Java program to show the implementation of queue using two stacks?

Explanation:

- Perform "Enqueue" and "Dequeue" operations.

Problem Statement 6

Write a C++/Java program to show the implementation of Circular queue using array?

Explanation:

- Perform "Insert", "Delete" and "Display".

Submission Link