CSE 106 : Data Structures and Algorithms I Sessional

Online 2 on Basic Data Structures

Total marks: 20 **Section: B1/B2** **Time: 1 hour**

Problem 1 (10 Marks)

You have implemented List ADT in your offline. Now, you need to add a new functionality to the ADT (both arrayList and linkedList) using the codes you have written in Assignment 1. Suppose, the list is currently [3 4 6| 5 1 2 9 8]. **You cannot use any additional data structure (array/linked list/stack/queue etc.) to implement this function.**

Function Number	Function Name	Parameter	Return value	List After Execution	Comment
16	reverse_range (int k)	3	-	[6 4 3| 2 1 5 8 9]	Reverse consecutive blocks of size k

Sample Input	Sample Output
1 3 1 4 1 6 1 5 1 1 1 2 1 9 1 8 5 5 16 3	Insert 3 [3|] Insert 4 Capacity increased from 2 to 4 [3 4|] Insert 6 Capacity increased from 4 to 8 [3 4 6|] Insert 5 [3 4 6 5|] Insert 1 Capacity increased from 8 to 16 [3 4 6 5 1|] Insert 2 [3 4 6 5 1 2|] Insert 9 [3 4 6 5 1 2 9|] Insert 8 [3 4 6 5 1 2 9 8|]

	Prev 5 [3 4 6| 5 1 2 9 8] Reverse_range 3 [6 4 3| 2 1 5 8 9]

Problem 2 (10 Marks)

Remove all adjacent duplicates iteratively from a string using a **Stack**. **Your solution must run in O(n), using only a stack.**

Input

An integer n, followed by a string containing n characters possibly containing duplicates.

The input string is read once as a whole (one string). You need not input characters into the stack from the user one-by-one. Instead, after reading the full string, you may process the string, pushing and popping characters on a stack as needed.

Output

Output string with adjacent duplicates iteratively removed.

Sample Input	Sample Output
6 abbaca	ca
7 aabccba	a
6 azxxzy	ay

Explanation of Sample 2

aabccba → (remove aa) → bccba → (remove cc) → bba → (remove bb) → a.