



Data Structure Lab

Class Task (Stack, Queue and It's Applications)

Deadline: 20-05-2025 at 11:59 PM (DM me the .cpp files in MS Teams)

Problem 1 (Reverse a String Using Only Stack)

Write a program that takes a string as user input and reverses it using a stack. Push each character of the string onto the stack and then pop them to create the reversed string.

Sample Input

Main Stack: hello

Sample Output

Reversed Stack: olleh

Problem 2 (Duplicate Brackets Checker Using Stack)

Write a program to check if an expression contains any duplicate brackets. Duplicate brackets mean two brackets that enclose nothing, like $((a+b))$. **You can use STL for solving the problem.**

Sample Input

$((a + b) + ((c)))$

Sample Output

Duplicate brackets found

Sample Input

$((a + b) + (c))$

Sample Output

No Duplicate brackets

Problem 3 (Generate Binary Numbers Using Queue)

Generate first n binary numbers using a queue.

Sample Input:

n = 5

Sample Output:

1 10 11 100 101

Sample Input:

n = 3

Sample Output:

1 10 11

Problem 4 (Check if a string is Palindrome Using Stack)

Create a program to check whether a word is a palindrome using a stack. Push all characters onto the stack, then pop them to form the reversed word and compare with the original. **(You can use STL)**

Sample Input

madam

Sample Output

Yes, it's a palindrome

Sample Input

Bangladesh

Sample Output

Not a palindrome

Problem 5 (Find Minimum Element using Stack)

Write a program to find the minimum element in the stack. The stack will contain some integers, and the program should find the smallest value using only stack operations.

Sample Input

Stack: 8 3 9 1 4

Sample Output

Minimum Element: 1

Problem 6 (Convert an Infix Expression to Postfix)

In the class, we have seen the infix to prefix conversion. Now your turn to write a program which will convert an infix expression to postfix expression. **(Don't worry it is very easy. Much easier than infix to prefix)**

Sample Input

Infix Expression: $A + B * C$

Sample Output

Infix Expression: $A B C * +$

Sample Input

Infix Expression: $A * (B + C)$

Sample Output

Infix Expression: $A B C + *$

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