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* Data Structure Lab (DSL) - Practical Number - 9 (Group - D)

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Title:-

To check whether the given string is palindrome or not using stack in c++.

Aim:-

A palindrome is a string of character that's the same forward and backward. Typically, punctuation, capitalization and spaces are ignored. One way to check for a palindrome is to reverse the characters in the string and then compare them the original - in a palindrome, the sequence will be identical. Write a C++ program with functions -

- 1) To print original and reversal string using stack.
- 2) To check whether the given string is palindrome or not.

Objective:-

- 1) To study and learn stack.
- 2) To implement operations on stack.
- 3) To understand and check palindrome string.

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Theory:-

A stack is an ordered list in which all insertions and deletions are made at one end called the top. It is a datastructure which passes LIFO i.e.

Palindrome String -

A palindrome is a string of character that's the same forward and backward. Typically, punctuation, capitalization and spaces are ignored.

Examples:-

- 1) Was it a car or a cat I saw?
- 2) I did, did I?
- 3) Top spot.

Algorithm:-

Step 1 - Start

Step 2 - Create a class palindrome which consists of stacks to store the string and member methods performing operations on stack.

Step 3 - Accept a string from the user and store it in stack.

Step 4 - Remove whitespace, punctuation, special characters from the string. Also convert capital letters to small letters.

Step 5 - Display the updated string.

Step 6 - Reverse the updated string.

Step 7 - Display the reversed string.

Step 8 - Check each and every character in the reversed string and the updated string serially.

Step 9 - If each and every character is same, then it is a palindrome string.

Step 10 - Stop.

Analysis:-

Time complexity of:-

1) push() and pop() is - $O(1)$.

2) Reverse(), remove_whitespace(), check_palindrome() is - $O(n)$.

Conclusion:-

Hence, we have checked for a palindrome string using stack.