Practical No -9

Title: Stack operation

Aim: A palindrome is a string of character that‘s the same forward and backward. Typically, punctuation, capitalization, and spaces are ignored. For example, “Poor Dan is in a droop” is a palindrome, as can be seen by examining the characters “poor danisina droop” and observing that they are the same forward and backward. One way to check for a palindrome is to reverse the characters in the string and then compare with them the original-in a palindrome, the sequence will be identical. Write C++ program with functions

a)To print original string followed by reversed string using stack

b) To check whether given string is palindrome or not.

Prerequisite:

- Basics of string and stack

Objectives:

- To understand implementation of Stack

Input: String of characters

Outcome:

- At end of this experiment, student will be able to illustrate the stack operation concept with example.

Theory:

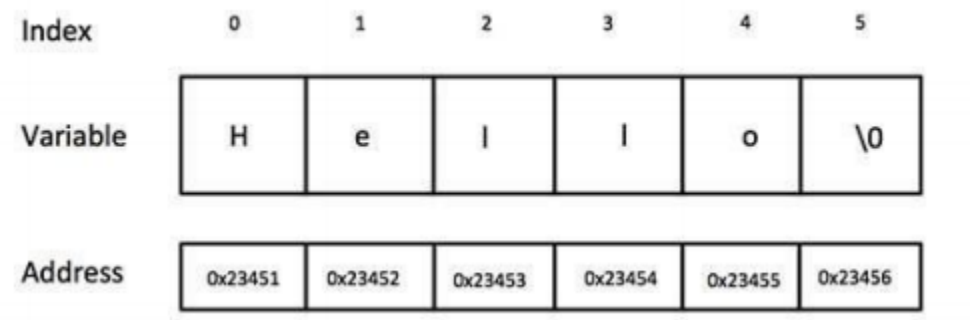
Strings

String is a one-dimensional array of characters which is terminated by a null character '\0'. Thus a null-terminated string contains the characters that comprise the string followed by a null. The following declaration and initialization create a string consisting of the word "Hello". To hold the null character at the end of the array, the size of the character array containing the string is one more than the number of characters in the word "Hello."

```
char greeting[6] = {'H', 'e', 'l', 'l', 'o', '\0'};

char greeting[] = "Hello";
```

Following is the memory presentation of above defined string in C/C++ − String Presentation in C/C++



Palindrome:

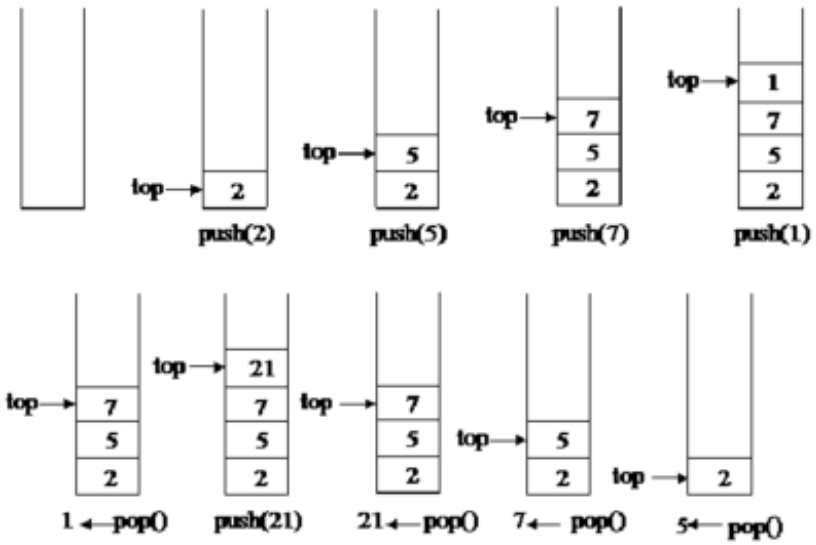
A string is said to be palindrome if reverse of the string is same as string. For example, “abba” is palindrome, but “abbc” is not palindrome.

Stacks

Stack is a LIFO (Last In First Out) data structure. It is an ordered list of same type of elements. A stack is a linear data structure where all insertions and deletions are permitted only at one end of the list. When elements are added to stack it grows at one end. Similarly, when elements are deleted from a stack, it shrinks at the same end.

Stack As an ADT

Stack is a LIFO structure. Stack can be represented using an array. A one dimensional array can be used to hold elements of a stack. Another variable “top” is used to keep track on the index of the top element.



Formally, a stack may be defined as follows:

```
typedef struct stack
{
 int data[MAX];
 int top;
};
```

Conclusion:

Thus we have implemented C++ program for stack operations.