IMPLEMENTATION OF STACK USING C++

Objective:

The objective of this task is to implement a **Stack** from scratch using the **C++ programming language**.
The program demonstrates fundamental stack operations such as **push, pop, and peek**, along with a driver program to verify the correctness of the implementation.

Description of Stack:

A **Stack** is a linear data structure that follows the **LIFO (Last In First Out)** principle.
In a stack, insertion and deletion of elements take place only at one end called the **top**.

Unlike arrays with random access, stack operations are restricted to one end.

Operations Implemented:

The following operations are implemented in the Stack:

- **Push** – Adds an element to the top of the stack
- **Pop** – Removes the top element from the stack
- **Peek** – Displays the top element without removing it
- **Display** – Displays all elements of the stack

Time Complexity Analysis:

Operation	Time Complexity
Push	O(1)
Pop	O(1)
Peek	O(1)

Operation	Time Complexity
Display	O(n)

Compile and Run Commands:

Compile (Using g++):

g++ "stack.cpp" -o stack

Run:

./stack

Sample Input and Output:

```
10 pushed to stack
20 pushed to stack
30 pushed to stack
Stack (top to bottom): 30 -> 20 -> 10
30 popped from stack
Stack (top to bottom): 20 -> 10
20 found at position 0 from top
40 not found in stack
PS C:\Users\Roshini\Documents\GitHub\Alfido-Tech-Internship\outpu
t>
```

Conclusion:

Thus, the **Stack** was successfully implemented in C++ using basic programming concepts. The program correctly demonstrates **push, pop, and peek operations** along with proper **time complexity analysis**, fulfilling the requirements of the task.