



Fundamentals of Data Structures using C

Stack ADT

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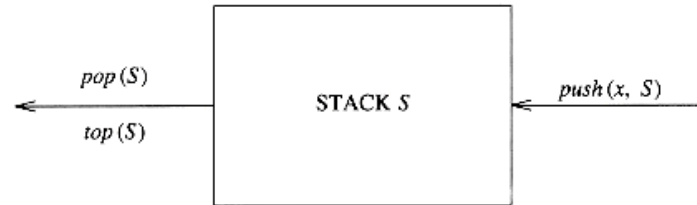
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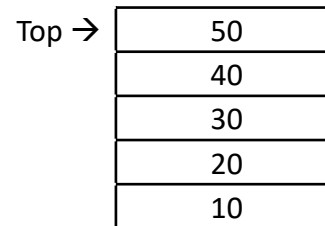
Introduction

- A stack is a list with the restriction that insertions and deletions can be performed in only one position, namely, the end of the list, called the top.
- It follows Last-In-First-Out (LIFO) principle.



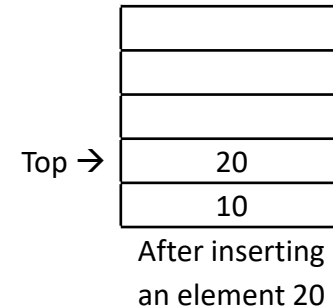
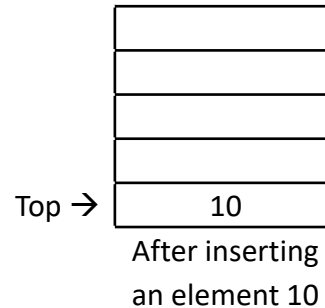
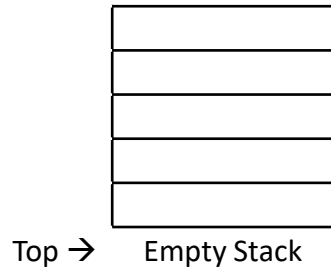
Operations on Stack

- Push - which is equivalent to insert
- Pop - which deletes the most recently inserted element
- Peek - return top of stack
- MakeEmpty - create an empty stack
- IsEmpty - check whether a stack is empty
- IsFull - check whether a stack is full



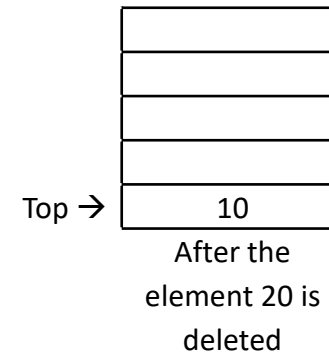
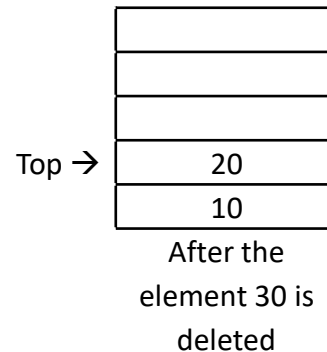
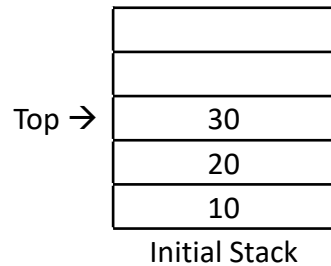
Push

- The process of inserting a new element to the top of the stack is called push operation.
- For every push operation the top is incremented by 1.



Pop

- The process of deleting an element from the top of stack is called pop operation.
- After every pop operation the top pointer is decremented by 1.



Overflow

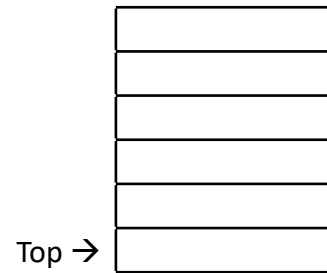
- Attempt to insert an element when the stack is full is said to be overflow.

Top →

50
40
30
20
10

Underflow

- Attempt to delete an element when the stack is empty is said to be underflow.



Implementation of Stacks

- Array
- Linked List

Applications of Stack

- Balancing symbols
- Infix to postfix conversion
- Evaluating postfix expression
- Function calls
- Towers of Hanoi
- 8 queens problem
- Page-visited history in a Web browser (Back Buttons)
- Undo sequence in a text editor
- Matching Tags in HTML and XML

Queries?

Thank You!