

# Chapter 3: Stack

A decorative graphic consisting of a horizontal bar with a gradient from magenta to purple, ending in a double-headed arrow shape pointing to the right.

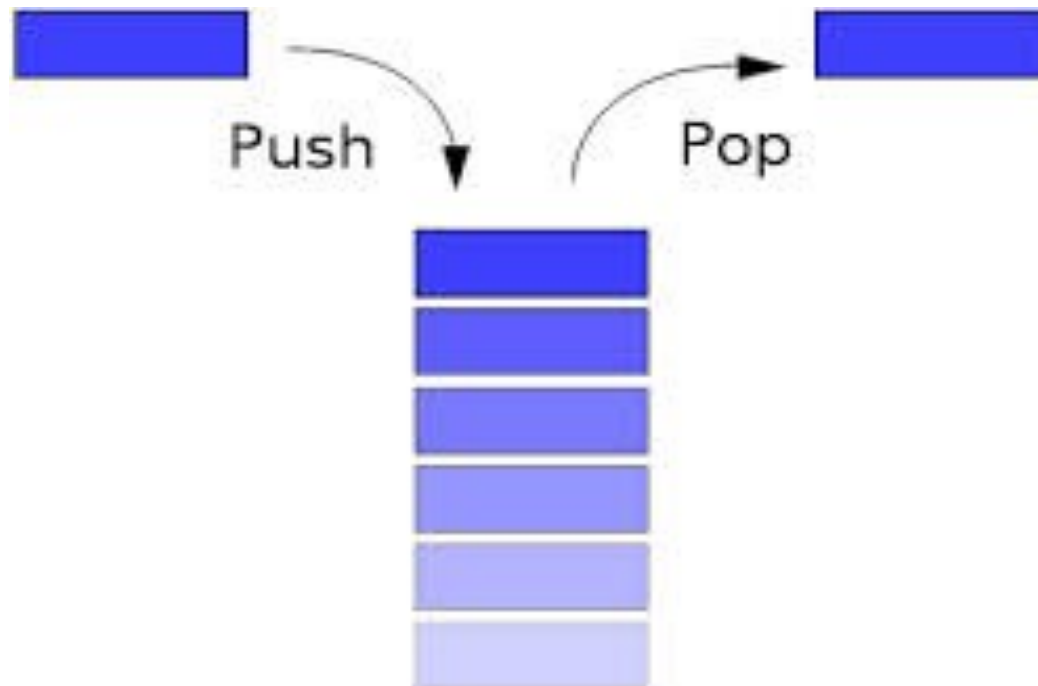
# Abstract

- ✓ Stack is a collection of items in which only the most recently added item may be removed.
- ✓ The latest added item is at the top.
- ✓ Basic operations are **push** and **pop**.
- ✓ Also known as **last-in, first-out** or **LIFO**.



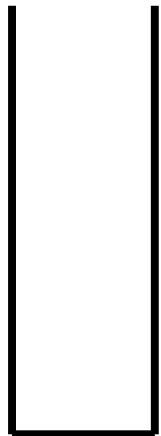
# Abstract ...

- Simply stack is a memory in which value are stored and retrieved in **last in first out** manner by using operations called **push** and **pop**.

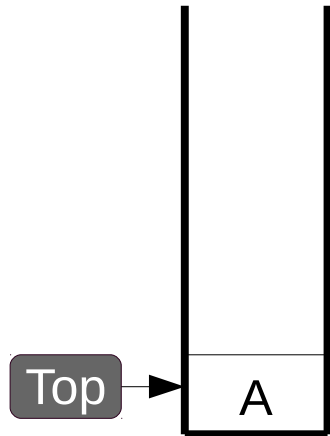


# Stack : Operations

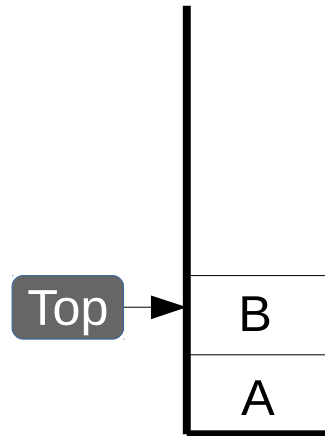
## Push Operations



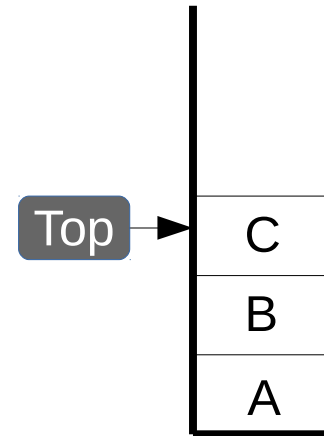
Empty Stack



push(A)



push(B)



push(C)

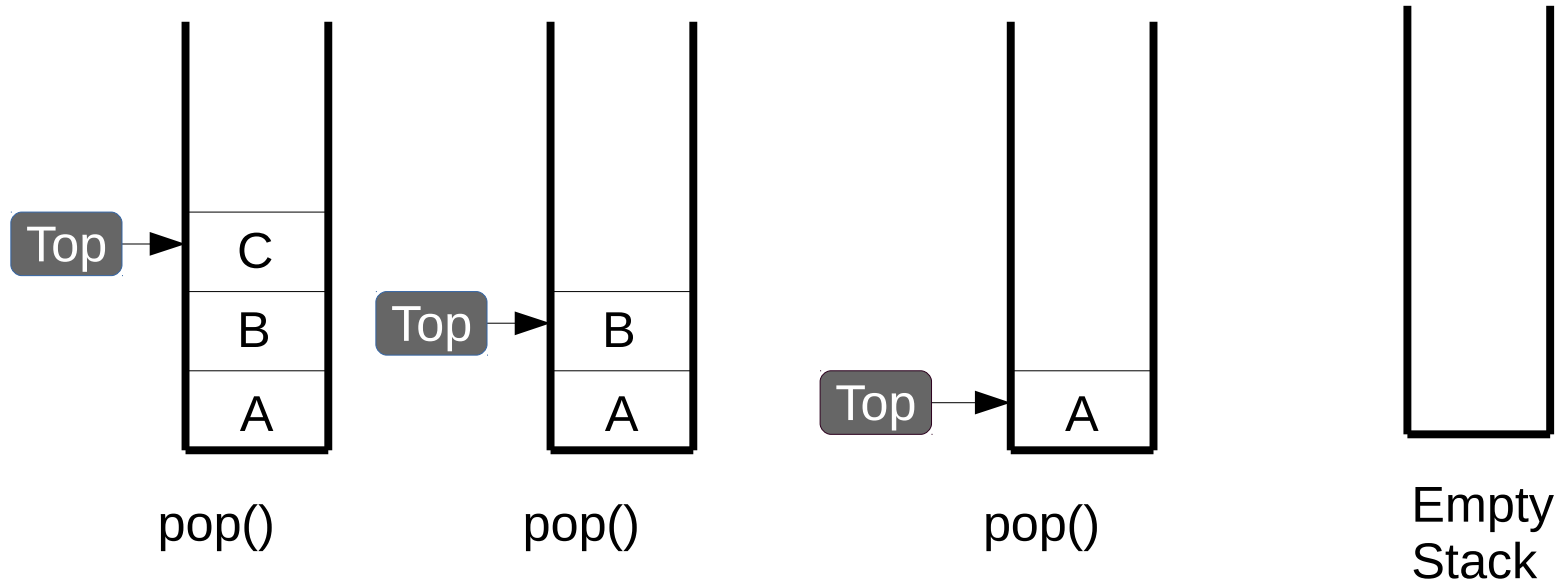
## OVERFLOW STATE

If the stack is full and does not contain enough space to accept the given item



# Stack : Operations

## Pop Operations

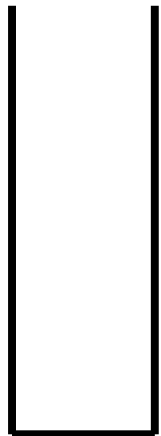


### UNDERFLOW STATE

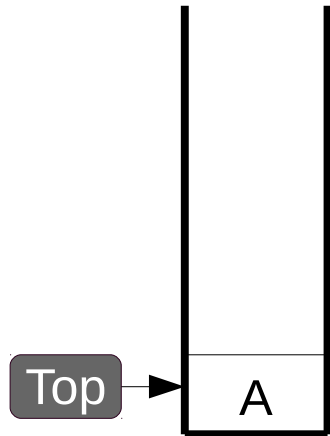
If the stack is empty and performing pop() operation results in underflow.

# Stack : Operations

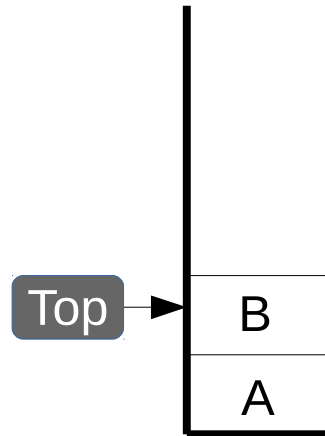
## Push Operations



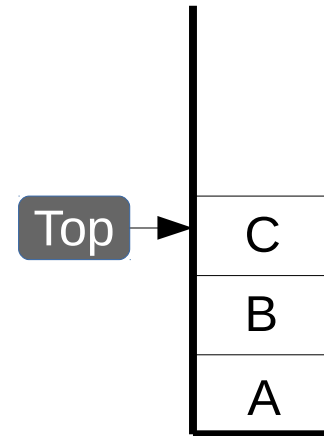
Empty Stack



push(A)



push(B)



push(C)

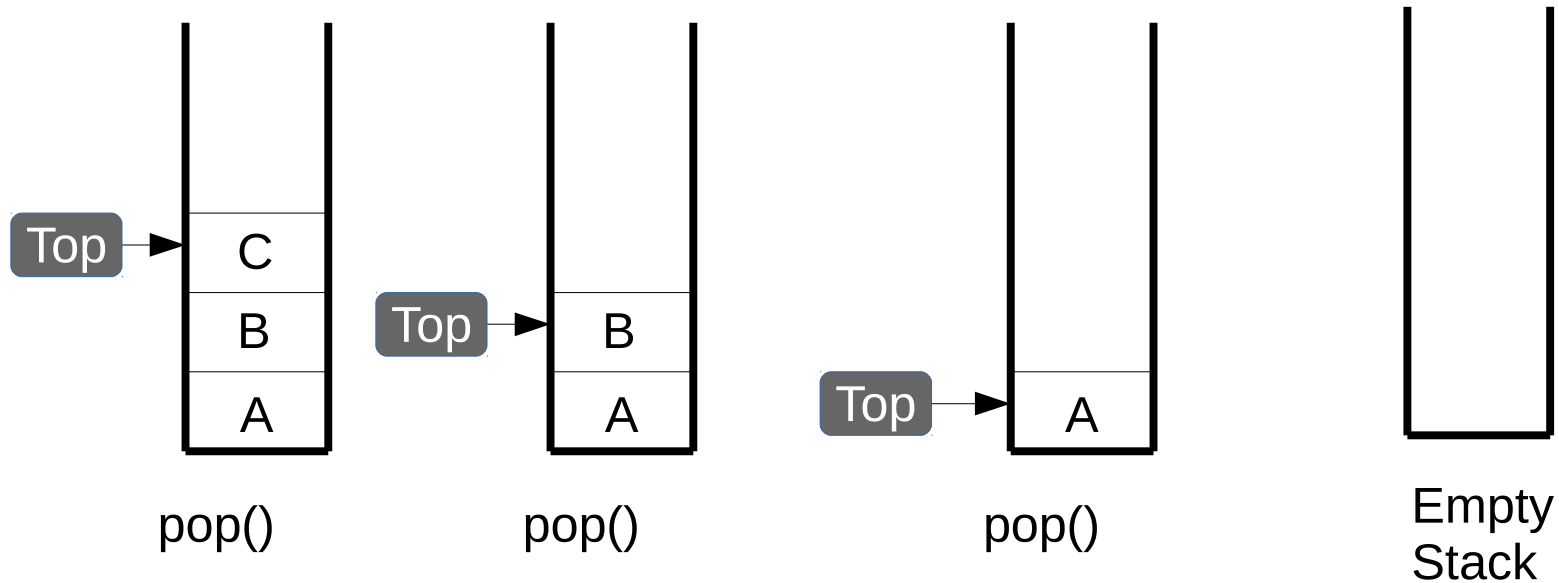
## OVERFLOW STATE

If the stack is full and does not contain enough space to accept the given item



# Stack : Operations

## Pop Operations



### UNDERFLOW STATE

If the stack is empty and performing pop() operation results in underflow.



# Stack : Operations



1. Create the stack
2. Add to the stack
3. Delete from the stack
4. Print the stack
5. Destroy the stack







# Applications



1. Decimal to Binary conversion
2. Conversion of expressions
  - Infix - Postfix
  - Infix - Prefix
3. Evaluation of expressions
  - Infix expression evaluation.
  - Prefix expression evaluation.
  - Postfix expression evaluation.
4. Function calls in C

