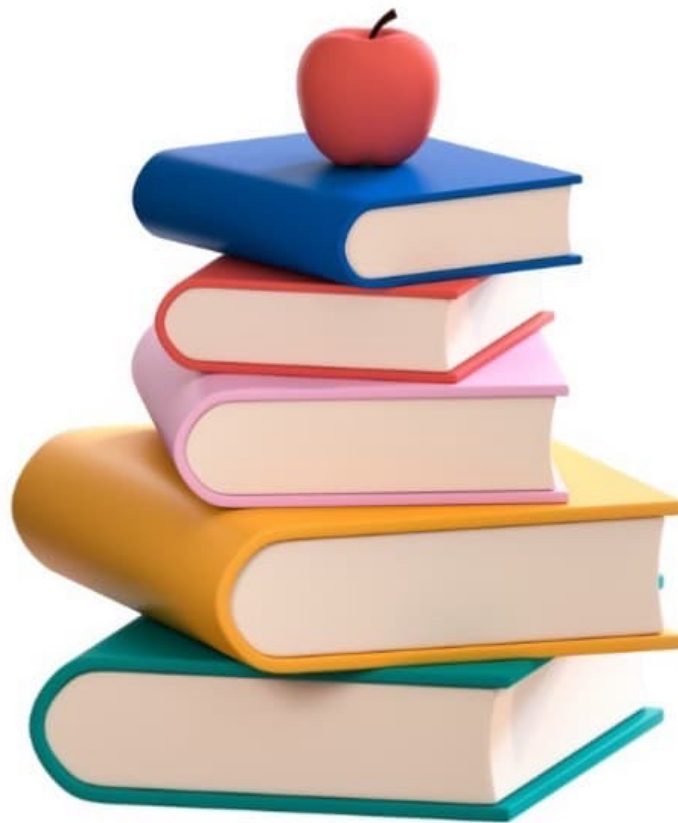


# Data Structures

## Stack Notes



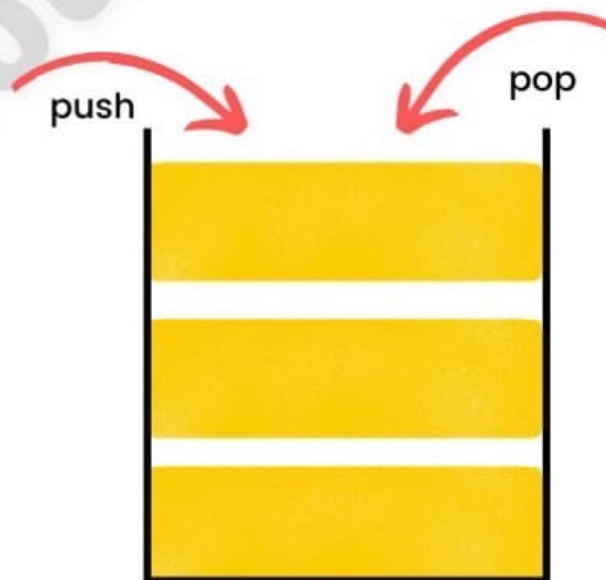
# Stack Operations :

- **push()**: When we insert an element in a stack then the operation is known as a push. If the stack is full then the overflow condition occurs.
- **pop()**: When we delete an element from the stack, the operation is known as a pop. If the stack is empty means that no element exists in the stack, this state is known as an underflow state.
- **isEmpty()**: It determines whether the stack is empty or not.
- **isFull()**: It determines whether the stack is full or not.
- **peek()**: It returns the element at the given position.
- **count()**: It returns the total number of elements available in a stack.
- **change()**: It changes the element at the given position.
- **display()**: It prints all the elements available in the stack.



## What is stack ?

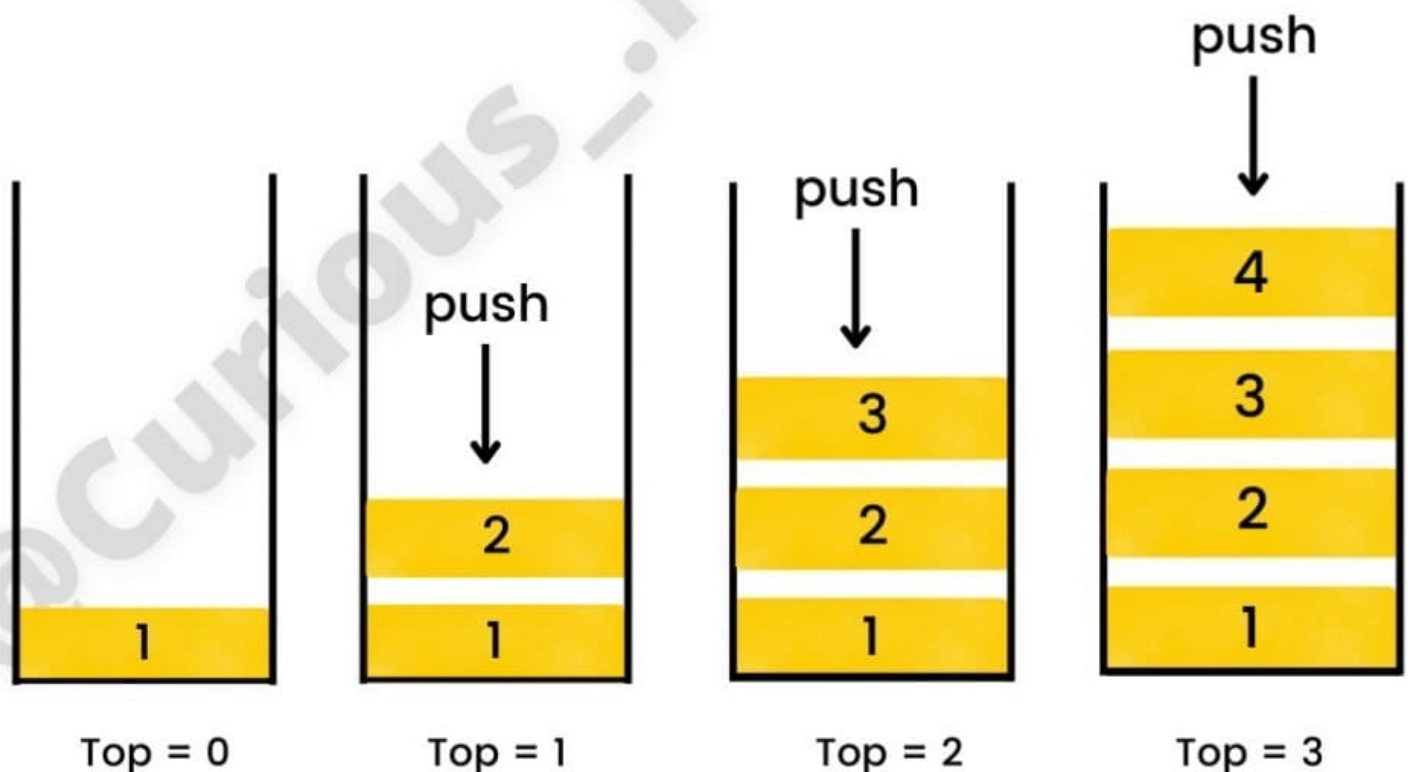
- A stack is a linear data structure that follows the principle of Last In First Out (LIFO).
- This means the last element inserted inside the stack is removed first.
- It contains only one pointer **top pointer** pointing to the topmost element of the stack.
- In other words, a stack can be defined as a container in which insertion and deletion can be done from the one end known as the top of the stack





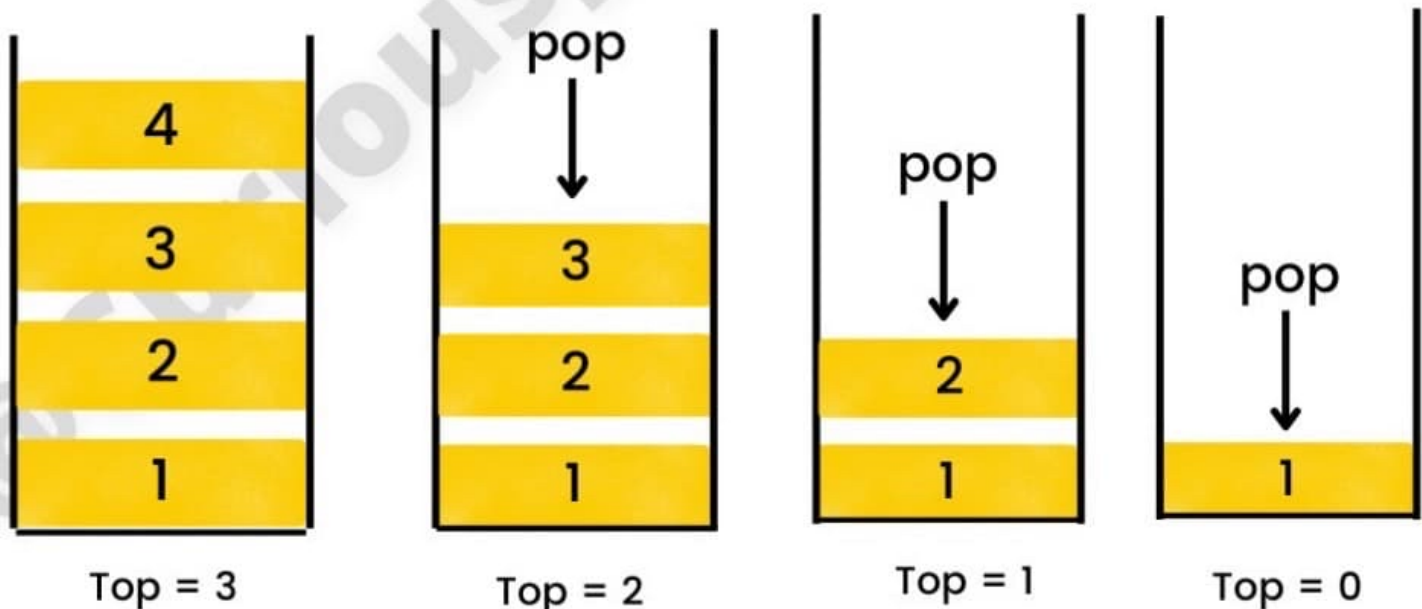
## Push operation :

- Before inserting an element in a stack, we check whether the stack is full.
- If we try to insert the element in a stack, and the stack is full, then the **overflow** condition occurs.
- When we initialize a stack, we set the value of top as -1 to check that the stack is empty.
- When the new element is pushed in a stack, first, the value of the top gets incremented, i.e.,  $\text{top} = \text{top} + 1$ , and the element will be placed at the new position of the top.
- The elements will be inserted until we reach the max size of the stack.



## Pop operation :

- Before deleting the element from the stack, we check whether the stack is empty.
- If we try to delete the element from the empty stack, then the underflow condition occurs.
- If the stack is not empty, we first access the element which is pointed by the top
- Once the pop operation is performed, the top is decremented by 1, i.e.,  $\text{top} = \text{top} - 1$ .



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