

K Stacks in an Array [CodeStudio](#)

Design a data structure that can manage multiple stacks efficiently within a single contiguous array.

1. **KStacks(int k, int n)**: Constructor that initializes the data structures.
 - Initializes **arr** to store stack elements, **top** to track top indices, **next** to manage free spots.
 - **Time Complexity: $O(n)$, Space Complexity: $O(n + k)$.**
2. **bool push(int x, int m)**: Pushes an element onto stack **m**.
 - Finds a free spot and inserts the element.
 - Updates pointers and top index.
 - **Time Complexity: $O(1)$, Space Complexity: $O(1)$.**
3. **int pop(int m)**: Pops and returns the top element from stack **m**.
 - Updates pointers to manage the stack and free spots.
 - **Time Complexity: $O(1)$, Space Complexity: $O(1)$.**
4. **int getTop(int m)**: Returns the top element of stack **m**.
 - **Time Complexity: $O(1)$, Space Complexity: $O(1)$.**
5. **int getSize(int m)**: Returns the number of elements in stack **m**.
 - **Time Complexity: $O(n)$, Space Complexity: $O(1)$.**
6. **bool isEmpty(int m)**: Checks if stack **m** is empty.
 - **Time Complexity: $O(1)$, Space Complexity: $O(1)$.**