Data Structure and Algorithms

Semester II 2021-22

Lab - 3

Topics: Data Structure : Stacks

Exercise

3.a: Implement a last-in-first-out (LIFO) stack using only two queues. The implemented stack should support all the functions of a normal stack (push, top, pop, and empty). Leetcode

- void push(int x) Pushes element x to the top of the stack.
- int pop() Removes the element on the top of the stack and returns it.
- int top() Returns the element on the top of the stack.
- boolean empty() Returns true if the stack is empty, false otherwise.
- Note: You must use only standard operations of a queue, which means that only push to back, peek/pop from front, size and is empty operations are valid.

3.b: Implement a first in first out (FIFO) queue using only two stacks. The implemented queue should support all the functions of a normal queue (push, peek, pop, and empty).Leetcode

- void push(int x) Pushes element x to the back of the queue.
- int pop() Removes the element from the front of the queue and returns it.
- int peek() Returns the element at the front of the queue.
- boolean empty() Returns true if the queue is empty, false otherwise.
- Note: You must use only standard operations of a stack, which means only push to top, peek/pop from top, size, and is empty operations are valid.

3.c Given a string s containing only three types of characters: '(', ')' and '*', return true if s is valid.Leetcode

- The following rules define a valid string: Any left parenthesis '(' must have a corresponding right parenthesis ')'.
- Any right parenthesis ')' must have a corresponding left parenthesis '('.
- Left parenthesis '(' must go before the corresponding right parenthesis ')'.
- '*' could be treated as a single right parenthesis ')' or a single left parenthesis '(' or an empty string "".