Lab Assignment 1: CS2233

August 14, 2023

Each question is of 5 marks.

Questions:

1. Write a C code that takes a postfix expression as input and outputs the corresponding result using the stack data structure. For example: if the input is ``2 3 +'' the output should be ``5''.

   You can assume that the user inputs the postfix expression in the correct format.

2. Write a C program that takes a queue (over integers) and an integer k as input, and reverse the first k element of the queue. You can take an array implementation of a queue that supports `enqueue` and `dequeue` operation.

   For example: if the input queue is $[10, 20, 30, 40, 50]$ with 10 and 50 as front and rear of the queue, and $k = 3$, then the output queue should be $[30, 20, 10, 40, 50]$.

3. Write a C program to implement two stacks in one array $A[1, 2, \ldots, n]$ so that neither stack overflows unless the total number of elements in both stacks together is n. The PUSH and POP operations should run in $O(1)$ time.

4. Write a C program to implement a queue using two stacks; that is, you are supposed to use the functionality of `Push` and `Pop`, and mimic the functionality of `enqueue` and `dequeue` operation. Analyze the running time of the queue operations