

# Lab Assignment 1: CS2233

August 13, 2025

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## Instructions:

- You need to write the implementation of **Stack** and **Queue** and their functionality - **push**, **pop**, **enqueue**, **dequeue** on your own.
- Each question is worth 5 marks.

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## Questions:

1. 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  $[30, 20, 10, 40, 50]$ .

### Input Format:

- The first line contains an integer  $n$  denoting the number of elements in the queue.
- The second line contains  $n$  integers representing the elements of the queue in the order from front to rear.
- The third line contains an integer  $k$ , the number of elements from the front of the queue to reverse.

### Output Format:

- Print the queue after reversing the first  $k$  elements.

### Example:

#### Test Case 1

#### Input:

```
5
10 20 30 40 50
3
```

**Output:**

30 20 10 40 50

**Test Case 2**

**Input:**

5  
5 15 25 35 45  
5

**Output:**

45 35 25 15 5

2. 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

**Input format:**

**1-Enqueue:** Add an element to the queue.

**2-Dequeue:** Remove and return the front element from the queue.

**3-Exit:** End the program.

**Test Case 1:**

**Input:**

```
1 10  // Enqueue 10
1 20  // Enqueue 20
2      // Dequeue
1 30  // Enqueue 30
2      // Dequeue
2      // Dequeue
3      // Exit
```

**Output:**

Dequeued: 10  
Dequeued: 20  
Dequeued: 30

**Test Case 2:**

**Input:**

```
2    // Dequeue
3    // Exit
```

**Output:**

Queue is empty