

Lab Assignment 1: CS2233

August 13, 2025

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