

Alexandria University
Faculty of Engineering
Specialized Scientific Programs
Computer & Communication Program
Spring 2025



Data Structure (1)
Course Code: CSE127
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Lab 03 **Queues**

1. Write a C program that contains the following functions (queue operations) on a queue containing n integer elements implemented as an array.
 - Queue* initialize ()
 - void enqueue (Queue* q, int x)
 - int dequeue (Queue* q)
 - int isEmpty (Queue*q)
 - int isFull (Queue*q)
2. Using the previous question function to implement a function that displays the elements in the queue.

void display (Queue*q)

3. Using the previous questions function to implement a function that displays how many even numbers are in the queue.

int countPrime(Queue*q)

HOMEWORK PROBLEMS

- 1- Write a C function to get the maximum value in the queue.

int maximum(Queue*q)

- 2- Write a C function to swap the first value with last value in the queue.

void swapFirstLast(Queue*q)

- 3- Write a C function that insert value in specific index into a Queue.

void insert (Queue*q,int value,int index)

- 4- Write a C function reverseOdd that takes a queue of integers as a parameter, and that modifies that queue, reversing the order of the odd integers in the queue while leaving the even integers in place. **void reverseOdd (Queue *q)**

For example:

The input queue:

< 14 13 17 8 4 10 11 4 15 18 19 >

After calling the function:

< 14 19 15 8 4 10 11 4 17 18 13 >

- 5- Write a C function that reverses the first kth elements in the queue.

void reverse (Queue *q, int k)

For example:

< 1 2 3 4 5 6 7 8 >

K = 4

After calling the function:

< 4 3 2 1 5 6 7 8>

- 6- Write a main function that displays a menu, allowing the user to select which function to test. Prompt the user for the corresponding input based on the chosen function. Include an additional option to exit the program.

Notes:

- You are only allowed to use the **Queue** or **Stacks** that are discussed in this and previous labs.
- You must **upload one file** that contains all the Queue operations, and the 5 functions required and the main function.