

# Rajalakshmi Engineering College

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## NeoColab\_REC\_CS23231\_DATA STRUCTURES

### REC\_DS using C\_Week 4\_COD\_Question 3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 9

#### Section 1 : Coding

##### 1. Problem Statement

Write a program to implement a queue using an array and pointers. The program should provide the following functionalities:

Insert an element into the queue. Delete an element from the queue. Display the elements in the queue.

The queue has a maximum capacity of 5 elements. If the queue is full and an insertion is attempted, a "Queue is full" message should be displayed. If the queue is empty and a deletion is attempted, a "Queue is empty" message should be displayed.

##### ***Input Format***

Each line contains an integer representing the chosen option from 1 to 3.

Option 1: Insert an element into the queue followed by an integer representing the element to be inserted, separated by a space.

Option 2: Delete an element from the queue.

Option 3: Display the elements in the queue.

### **Output Format**

For option 1 (insertion):-

1. The program outputs: "<data> is inserted in the queue." if the data is successfully inserted.
2. "Queue is full." if the queue is already full and cannot accept more elements.

For option 2 (deletion):-

1. The program outputs: "Deleted number is: <data>" if an element is successfully deleted and returns the value of the deleted element.
2. "Queue is empty." if the queue is empty no elements can be deleted.

For option 3 (display):-

1. The program outputs: "Elements in the queue are: <element1> <element2> ... <elementN>" where <element1>, <element2>, ..., <elementN> represent the elements present in the queue.
2. "Queue is empty." if the queue is empty no elements can be displayed.

For invalid options, the program outputs: "Invalid option."

Refer to the sample output for the formatting specifications.

### **Sample Test Case**

Input: 1 10

3

5

Output: 10 is inserted in the queue.

Elements in the queue are: 10

Invalid option.

### **Answer**

// You are using GCC

#include <stdio.h>

#include <stdlib.h>

#define MAX\_SIZE 5

int queue[MAX\_SIZE];

int front = -1, rear = -1;

void enqueue(int pages) {

if (rear == MAX\_SIZE - 1) {

printf("Queue is full.\n");

return;

}

if (front == -1)

front = 0;

rear++;

queue[rear] = pages;

printf("%d is inserted in the queue.\n", pages);

}

void dequeue() {

if (front == -1 || front > rear) {

printf("Queue is empty.\n");

return;

}

printf("Deleted number is: %d\n", queue[front]);

front++;

if (front > rear)

front = rear = -1;

}

void display() {

if (front == -1 || front > rear) {

printf("Queue is empty.\n");

```

        return;
    }
    printf("Elements in the queue are: ");
    for (int i = front; i <= rear; i++)
        printf("%d ", queue[i]);
    printf("\n");
}

int main() {
    int option, pages;
    while (1) {
        if (scanf("%d", &option) == EOF)
            break;
        switch (option) {
            case 1:
                if (scanf("%d", &pages) == EOF)
                    break;
                enqueue(pages);
                break;
            case 2:
                dequeue();
                break;
            case 3:
                display();
                break;
            case 4:
                printf("Exiting program\n");
                return 0;
            default:
                printf("Invalid option.\n");
                break;
        }
    }
    return 0;
}

```

**Status :** Partially correct

**Marks :** 9/10