# Rajalakshmi Engineering College

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## NeoColab_REC_CS23231_DATA STRUCTURES

### REC_DS using C_Week 4_COD_Question 1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

### Section 1 : Coding

1. Problem Statement

Imagine a bustling coffee shop, where customers are placing their orders for their favorite coffee drinks. The cafe owner Sheeren wants to efficiently manage the queue of coffee orders using a digital system. She needs a program to handle this queue of orders.

You are tasked with creating a program that implements a queue for coffee orders. Each character in the queue represents a customer's coffee order, with 'L' indicating a latte, 'E' indicating an espresso, 'M' indicating a macchiato, 'O' indicating an iced coffee, and 'N' indicating a nabob.

Customers can place orders and enjoy their delicious coffee drinks.

***Input Format***

The input consists of integers corresponding to the operation that needs to be performed:

Choice 1: Enqueue the coffee order into the queue. If the choice is 1, the following input is a space-separated character ('L', 'E', 'M', 'O', 'N').

Choice 2: Dequeue a coffee order from the queue.

Choice 3: Display the orders in the queue.

Choice 4: Exit the program.

***Output Format***

The output displays messages according to the choice and the status of the queue:

If the choice is 1:

1. Insert the given order into the queue and display "Order for [order] is enqueued." where [order] is the coffee order that is inserted.
2. If the queue is full, print "Queue is full. Cannot enqueue more orders."

If the choice is 2:

1. Dequeue a character from the queue and display "Dequeued Order: " followed by the corresponding order that is dequeued.
2. If the queue is empty without any orders, print "No orders in the queue."

If the choice is 3:

1. The output prints "Orders in the queue are: " followed by the space-separated orders present in the queue.
2. If there are no orders in the queue, print "Queue is empty. No orders available."

If the choice is 4:

1. Exit the program and print "Exiting program"

If any other choice is entered, the output prints "Invalid option."

Refer to the sample output for the exact text and format.

***Sample Test Case***

Input: 1 L
1 E
1 M
1 O
1 N
1 O
3
2
3
4

Output: Order for L is enqueued.
Order for E is enqueued.
Order for M is enqueued.
Order for O is enqueued.
Order for N is enqueued.
Queue is full. Cannot enqueue more orders.
Orders in the queue are: L E M O N
Dequeued Order: L
Orders in the queue are: E M O N
Exiting program

***Answer***

```
#include <stdio.h>
#define MAX_SIZE 5

char orders[MAX_SIZE];
int front = -1;
int rear = -1;

void initializeQueue() {
   front = -1;
   rear = -1;
}

int isEmpty() {
```

```
    return(front==-1&&rear==-1);
}

int isFull() {
    return rear==MAX_SIZE-1;
}

int enqueue(char order) {
    if(isFull()){
        printf("Queue is full. Cannot enqueue more orders.\n");
        return 0;
    }
    else{
        if(front==-1)
            front=0;
        rear++;
        orders[rear]=order;
        printf("Order for %c is enqueued.\n",order);
        return 1;
    }
}

int dequeue() {
    if(isEmpty()){
        printf("No orders in the queue.\n");
        return 0;
    }
    char c=orders[front];
    if(front==rear)
        front=rear=-1;
    else
        front++;
    printf("Dequeued Order: %c\n",c);
    return 1;
}

void display() {
    if(isEmpty())
        printf("Queue is empty. No orders available.\n");
    else
    {
        printf("Orders in the queue are: ");
```

```
        for(int i=front;i<=rear;i++)
            printf("%c ",orders[i]);
        printf("\n");
    }
}

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

***Status :*** Correct ***Marks : 10/10***