

Rajalakshmi Engineering College

Name: Soameshwaran D
Email: 240701520@rajalakshmi.edu.in
Roll no: 240701520
Phone: 7358671540
Branch: REC
Department: I CSE FE
Batch: 2028
Degree: B.E - CSE

Scan to verify results



NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 4_COD_Question 5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

You are tasked with implementing basic operations on a queue data structure using a linked list.

You need to write a program that performs the following operations on a queue:

Enqueue Operation: Implement a function that inserts an integer element at the rear end of the queue. Print Front and Rear: Implement a function that prints the front and rear elements of the queue. Dequeue Operation: Implement a function that removes the front element from the queue.

Input Format

The first line of input consists of an integer N, representing the number of elements to be inserted into the queue.

The second line consists of N space-separated integers, representing the queue elements.

Output Format

The first line prints "Front: X, Rear: Y" where X is the front and Y is the rear elements of the queue.

The second line prints the message indicating that the dequeue operation (front element removed) is performed: "Performing Dequeue Operation:".

The last line prints "Front: M, Rear: N" where M is the front and N is the rear elements after the dequeue operation.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5

12 56 87 23 45

Output: Front: 12, Rear: 45

Performing Dequeue Operation:

Front: 56, Rear: 45

Answer

```
#include <stdio.h>
#include <stdlib.h>
```

```
struct Node {
    int data;
    struct Node* next;
};
```

```
struct Node* front = NULL;
struct Node* rear = NULL;
```

```
// You are using GCC
typedef struct Queue {
    Node* front;
    Node* rear;
```

```
} Queue;
```

```
// Declare the queue globally  
Queue q;
```

```
// Initialize the queue  
void initQueue() {  
    q.front = q.rear = NULL;  
}
```

```
// Enqueue operation  
void enqueue(int value) {  
    Node* newNode = (Node*)malloc(sizeof(Node));  
    newNode->data = value;  
    newNode->next = NULL;  
  
    if (q.rear == NULL) {  
        q.front = q.rear = newNode;  
    } else {  
        q.rear->next = newNode;  
        q.rear = newNode;  
    }  
}
```

```
// Dequeue operation  
void dequeue() {  
    if (q.front == NULL) return;  
  
    Node* temp = q.front;  
    q.front = q.front->next;  
  
    if (q.front == NULL)  
        q.rear = NULL;  
  
    free(temp);  
}
```

```
// Print front and rear of queue  
void printFrontRear() {  
    if (q.front == NULL) return;  
    printf("Front: %d, Rear: %d ", q.front->data, q.rear->data);  
}
```

```
int main() {  
    int n, data;  
    scanf("%d", &n);  
    for (int i = 0; i < n; i++) {  
        scanf("%d", &data);  
        enqueue(data);  
    }  
    printFrontRear();  
    printf("Performing Dequeue Operation:\n");  
    dequeue();  
    printFrontRear();  
    return 0;  
}
```

Status : Correct

Marks : 10/10