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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

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

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

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

void enqueue(int d)

{
```

```c
    struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));
    newNode->data = d;
    newNode->next = NULL;

    if (rear == NULL)

    {


        // If the queue is empty, both front and rear will point to the new node
        front = rear = newNode;


    } else

    {


        // Add the new node at the end of the queue and update rear
        rear->next = newNode;
        rear = newNode;


    }

    }
void printFrontRear()

    {


    if (front == NULL)

    {


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


    } else
```

```c
{

    printf("Front: %d, Rear: %d\n", front->data, rear->data);

}

}

void dequeue()

{

    if (front == NULL)

    {

        printf("Queue is empty. Cannot dequeue.\n");
        return;

    }

    struct Node* temp = front;
    front = front->next;

    // If the front becomes NULL, then also set rear to NULL
    if (front == NULL)

    {

        rear = NULL;

    }

    free(temp); // Free the memory of the dequeued node
```

```c
}
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*