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 : 10

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

```c
#include<stdio.h>
#include<stdlib.h>
#define MAX 5
int queue[MAX +1],rear=-1,front=-1,item;

void insert(int to)
{

   if(rear==MAX -1)
   printf("Queue is full.\n");
   else
   {
      if(front==-1)
      front=0;
     printf("%d is inserted in the queue.\n",to);
     rear++;
     queue[rear]=to;
   }
}

void del()
{
   if(front==-1||front>rear)
   printf("Queue is empty.\n");
   else
   {
     item=queue[front];
     printf("Deleted number is: %d\n",item);
     front++;
   }
}

void display()
{
   if(front==-1||front>rear)
```

```c
        printf("Queue is empty.\n");
        else
        {
            printf("Elements in the queue are: ");
            for(int i=front;i<=rear;i++)
            printf("%d ",queue[i]);
        }
        printf("\n");
}


int main()
{
    int ch,d;
    while(1)
    {
        if(scanf("%d",&ch)!=1)
        {
            break;
        }
        switch(ch)
        {
            case 1:
            if(scanf("%d",&d)==1){
                insert(d);
            }
            break;
            case 2:
            {
                del();
                break;
            }
            case 3:
            {
                display();
                break;
            }
            default:
            {
                printf("Invalid option.\n");
                break;
```

```
                    }
                }
            }
        }
```

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