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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>
#define MAX 5
int queue[MAX];
int front=-1;
int rear=-1;
void insert (int value){
   if(rear==MAX-1){
      printf("Queue is full.\n");
      return;
   }
   else{
      if(front==-1) front=0;
      queue[++rear]=value;
      printf("%d is inserted in the queue.\n",value);
   }
}
void del(){
   if(front==-1||front>rear) {
      printf("Queue is empty.\n");
      return;
   }
   else{
      printf("Deleted number is: %d\n",queue[front++]);
   }
}
void display(){
   if(front==-1||front>rear) {printf("Queue is empty.\n");
   return;
   }
   else{
      printf("Elements in the queue are:");
      for(int i=front;i<=rear;i++){
         printf(" %d",queue[i]);
      }
```

```
        printf("\n");
    }
}
int main(){
    int ch,val;
    while(1){
        if(scanf("%d",&ch)==EOF){
            break;
        }
        switch(ch){
            case 1:
            scanf(" %d",&val);
            insert(val);
            break;
            case 2:
            del();
            break;
            case 3:
            display();
            break;
            default:
            printf("Invalid option.");
            return 0;
        }
    }
}
```

Status : Partially correct **Marks : 9/10**