Program - 10

Title : **Write a Program to Implement Circular Queue Operations by using Array**

Code:

```
#include<stdio.h>
#define MAX_SIZE 10

int cq[MAX_SIZE], front = -1, rear = -1;

void insert(int item)
{
   if ((front == 0 && rear == MAX_SIZE - 1) || (front == rear + 1))
   {
      printf("Queue Overflow \n");
      return;
   }
   else if (front == -1 && rear == -1)
   {
      front = rear = 0;
   }
   else if (rear == MAX_SIZE - 1 && front != 0)
   {
      rear = 0;
   }
   else
   {
      rear++;
   }
   cq[rear] = item;
}

void delete()
{
   if (front == -1 && rear == -1)
   {
      printf("Queue Underflow\n");
      return;
   }
   int item = cq[front];
   if (front == rear)
   {
      front = -1;
      rear = -1;
   }
   else if (front == MAX_SIZE - 1)
   {
      front = 0;
   }
   else
   {
      front++;
   }
   printf("Deleted element is: %d\n", item);
}

void display()
```

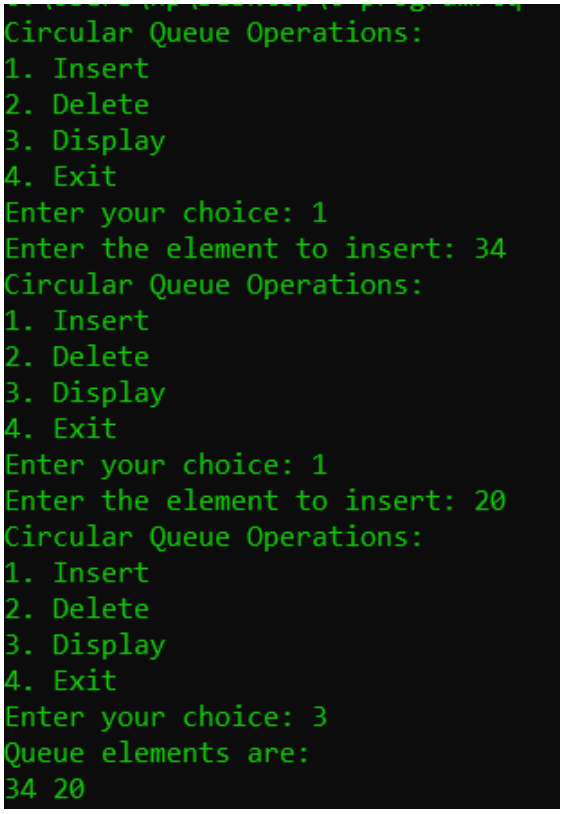
```
{
    if (front == -1 && rear == -1)
    {
        printf("Queue is empty\n");
        return;
    }
    printf("Queue elements are:\n");
    if (rear >= front)
    {
        for (int i = front; i <= rear; i++)
        {
            printf("%d ", cq[i]);
        }
        printf("\n");
    }
    else
    {
        for (int i = front; i < MAX_SIZE; i++)
        {
            printf("%d ", cq[i]);
        }
        for (int i = 0; i <= rear; i++)
        {
            printf("%d ", cq[i]);
        }
        printf("\n");
    }
}

int main()
{
    int choice, item;
    do
    {
        printf("Circular Queue Operations:\n");
        printf("1. Insert\n2. Delete\n3. Display\n4. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);
        switch (choice)
        {
            case 1:
                printf("Enter the element to insert: ");
                scanf("%d", &item);
                insert(item);
                break;
            case 2:
                delete();
                break;
            case 3:
                display();
                break;
            case 4:
                printf("Program Exited\n");
                break;
            default:
                printf("Invalid choice, Please try again\n");
        }
```

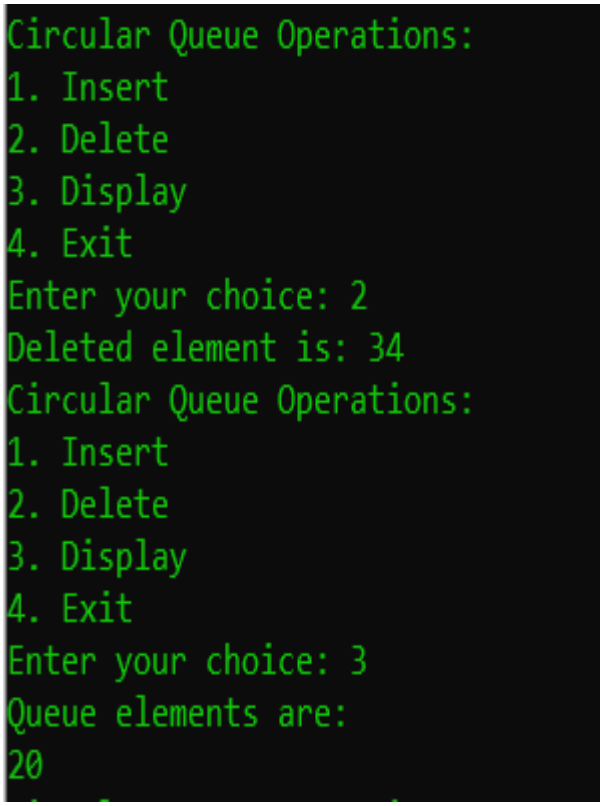
```
    } while (choice != 4);
    return 0;
}
```

Output:

Insertion



Deletion



Date : ___/____/_____	Teacher Sign ……