Assignment No. 8

Implementation of Circular Queue

Aim
Implementation of circular queue using array and perform following operations on it. i) Add a record ii) Delete a record iii) Checking Empty iv) Checking Underflow v) Checking overflow

Objective(s)	
1	To understand the concept of Queue.
2	To understand the concept of Circular Queue.
3	To study how Queue is represented as an ADT.

Theory
1. What is Queue? Explain Queue operations with neat diagrams. 2. Explain how Queue can be implemented as an ADT. 3. What is Circular Queue? Explain with example.

Algorithms:

a) Algorithm to Insert an Element in a Circular Queue:

```
Step 1: IF FRONT = 0 and Rear = MAX - 1, then
                Write "OVERFLOW"
                Goto Step 4
        [END OF IF]
Step 2: IF FRONT = -1 and REAR = -1, then;
                SET FRONT = REAR = 0
        ELSE IF REAR = MAX - 1 and FRONT != 0
                SET REAR = 0
        ELSE
                SET REAR = REAR + 1
        [END OF IF]
Step 3: SET QUEUE[REAR] = VAL
Step 4: Exit
```

b) Algorithm to Delete an Element from a Circular Queue:

```
Step 1: IF FRONT = -1, then
                    Write "Underflow"
                    Goto Step 4
        [END OF IF]
Step 2: SET VAL = QUEUE[FRONT]
Step 3: IF FRONT = REAR
                    SET FRONT = REAR = -1
        ELSE
                    IF FRONT = MAX -1
                              SET FRONT = 0
                    ELSE
                              SET FRONT = FRONT + 1
                    [END OF IF]
        [END OF IF]
Step 4: EXIT
```

Conclusion