# QUEUE

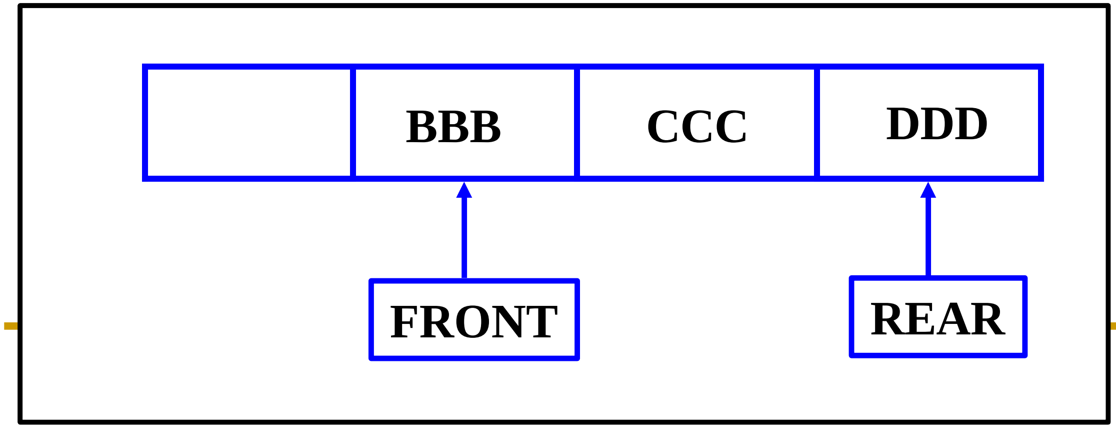
SANYAM MEHENDIRATTA

# Queue :

A queue is a linear list of elements in which deletions can take place only at one end, called FRONT, and insertion can take only at the other end, called the REAR.

Queues are also called First-in-First-out (FIFO).

Static Representation of Queue:



**Inserting “EEE” REAR is not Incremented Because Queue Is full**

# QINSERT(Q, N, FRONT, REAR,ITEM)

This procedure inserts an element ITEM into a queue.

```
1. [Queue already filled?]
   If REAR >= N, then
            Write OVERFLOW, and Return.
2. [Find new value of REAR]
      If FRONT : = NULL, then [Queue initially empty.]
            Set FRONT := 1 and REAR := 1
      Else
            Set REAR := REAR +1
      [End of If structure]
3. [This inserts new element.]
   Set Q[REAR] := ITEM
4. Return
```

# QDELETE (Q, N, FRONT,REAR, ITEM)

This procedure deletes an element from a queue and assigns it to the variable ITEM.

```
1. [Queue already empty?]
       If FRONT := NULL, then : Write UNDERFLOW, and Return
2. Set ITEM := Q[FRONT]
3. [Find new value of Front.]
       If FRONT=REAR, then :
               Set FRONT := NULL and REAR := NULL.
        Else
               Set FRONT := FRONT +1.
       [End of If structure.]
4. Return
```

## The queue operations

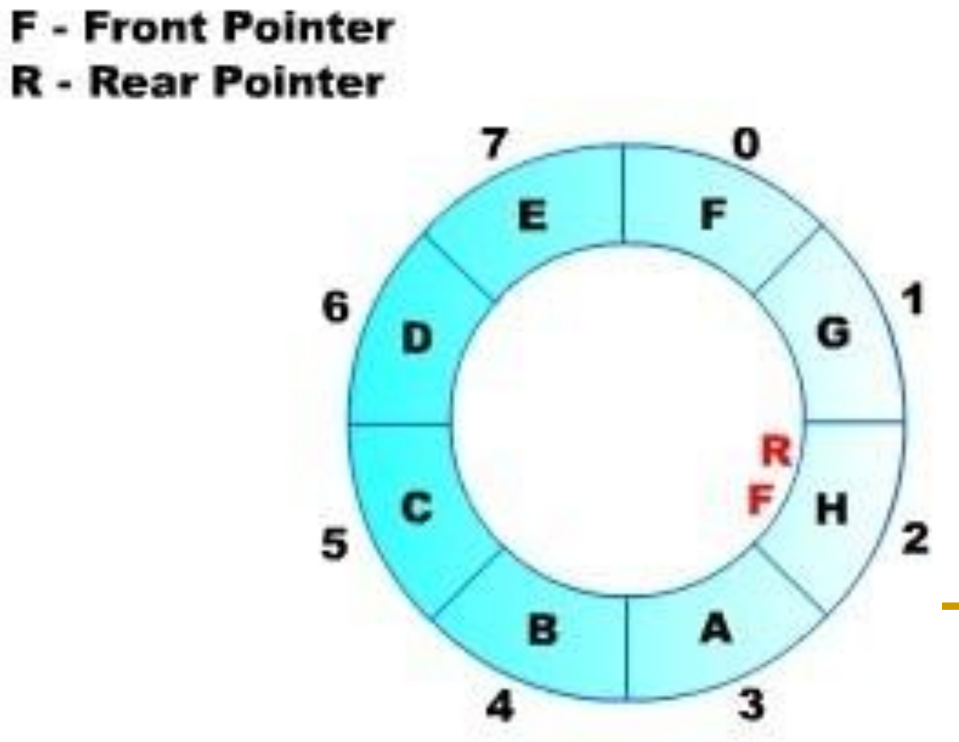
| | |
|---|---|
| 1.Queue | Create an empty queue |
| 2.~Queue | Destroy an existing queue |
| 3.isEmpty | Determine whether queue is empty |
| 4.isFull | Determine whether the queue is full |
| 5.enqueue | Add an item to the end of the queue |
| 6.dequeue | Remove the item from front of queue |
| 7. peek | Retrieve the item at front of queue |

# Circular Queue :

In circular queue is one in which the first element comes after the last element.

Circular queues are the queues implemented in circular form rather than in a straight line.

Circular queues overcome the problem of unutilized space in linear queue implemented as an array.



## Priority queues:

A priority queue is a collection of elements such that each element has been assigned a priority and such that the order in which elements are deleted and processed comes from the following rules :

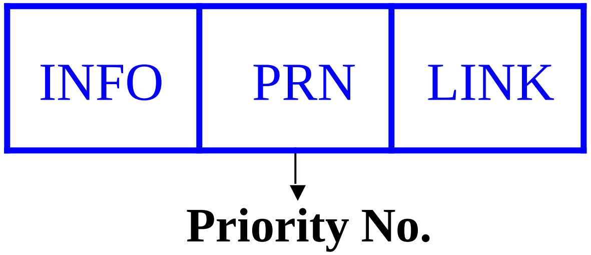
1. An element of higher priority is processed before any element of lower priority.

2. Two elements with the same priority are processed according to the order in which they were added to the queue.

There are two ways of maintaining a priority queue in memory,

1. One-way list
2. Multiple queues

In One-way list, each node will contain three items of information.



INFO PRN LINK

Priority No.

In multiple queue, one queue grows from position of 1 of the array and the other grows from the last position.

# Applications of Queues :

1.Round Robin Technique for processor scheduling is implemented using queues.

2. All types of customer service (like railway ticket reservation) center software are designed using queues to store customer’s information.

3.Printer server routines are designed using queues. A number of users share a printer using printer server, then server spool’s all the jobs from all the users to the server’s hard disk in a queue. From here job number in the queue.