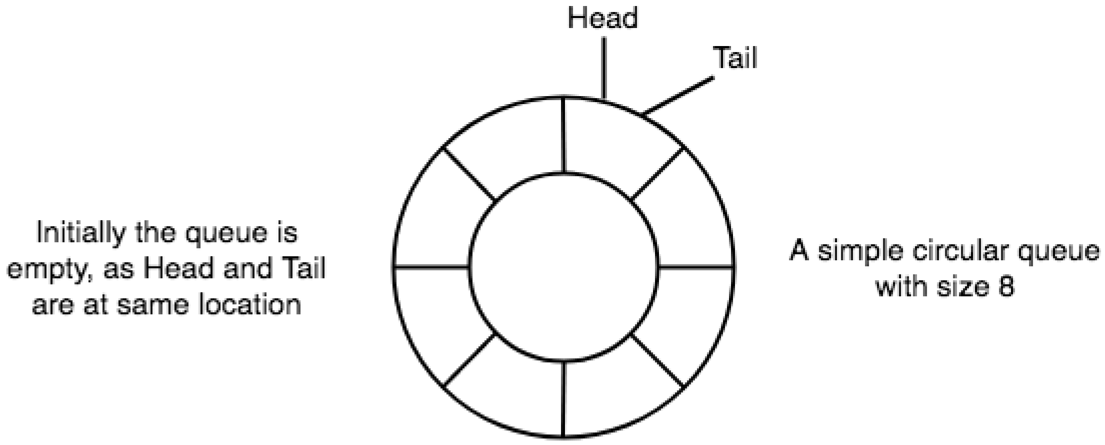
CIRCULAR QUEUE

- **What is a circular queue?**

➢ A circular queue is a linear data structure in which the operations are performed based on FIFO (First In First Out) principle and the last position is connected back to the first position to make a circle.


Head
Tail
Initially the queue is empty, as Head and Tail are at same location
A simple circular queue with size 8

- **What are the operations associated with a priority queue?**

  - **Front:** Get the front item from queue.
  - **Rear:** Get the last item from queue.
  - **enQueue(value)** This function is used to insert an element into the circular queue. In a circular queue, the new element is always inserted at Rear position.

    Steps:

    1) Check whether queue is Full – Check ((rear == SIZE-1 && front == 0) || (rear == front-1)).
    2) If it is full then display Queue is full. If queue is not full then, check if (rear == SIZE – 1 && front != 0) if it is true then set rear=0 and insert element.

       Time complexity: O(1)

- **deQueue()** This function is used to delete an element from the circular queue. In a circular queue, the element is always deleted from front position.

  Steps:

  1) Check whether queue is Empty means check (front==-1).
  2) If it is empty then display Queue is empty. If queue is not empty then step 3
  3) Check if (front==rear) if it is true then set front=rear= -1 else check if (front==size-1), if it is true then set front=0 and return the element.

  Time complexity: O(1)