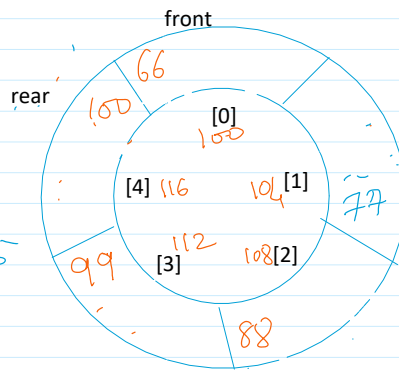


28 October 2023 17:29

① $rear++$

$$rear = (rear + 1) \% SIZE$$

$$arr[rear] = data$$



$$\begin{aligned} front &= (front + 1) \% 5 \\ &= (4 + 1) \% 5 \\ &= 5 \% 5 \\ front &= 0 \end{aligned}$$

Enqueue:

- 1) Check if queue is not full
- 2) Increment rear as
 $Rear = (rear + 1) \% SIZE$
- 3) Add element at rear position
- 4) If $front == -1$, make $front = 0$

$$\begin{aligned} \text{if } (front == Rear) \\ front &= -1 \\ Rear &= -1 \end{aligned}$$

Dequeue :

Check if Queue is not empty.

Increment front .

If front is 4 and rear is 0

to delete the rear position, we cannot increment front as front ++ Will be

index 5 but we want to delete index 0;

So,

$$Front = front + 1 \% SIZE$$

If deleting the last element in queue

If $(front == rear)$

$$Front = rear = -1$$

Queue Empty conditionIf $(rear == -1)$ queue is empty**Queue Full condition :**

When Queue is full,

Rear = 0 front = 1

Rear = 1, front = 2

Rear = 2 front = 3

Rear = 3 front = 4

Rear = 4, front = 0

This means,

$$Front == rear + 1$$

But when rear = 4 front = 0

0 == 4+1 does not satisfy the above condition

So the queue full condition can be

$$Front == (rear + 1) \% SIZE$$

$$0 == (4 + 1) \% 5$$

$$0 == 5 \% 5$$

$$0 == 0$$

Option 2:If $rear == SIZE - 1$

$$Rear = 0;$$

Else

$$\begin{aligned} \left\{ \begin{array}{ll} front = 1 & rear = 0 \\ front = 2 & rear = 1 \\ front = 3 & rear = 2 \\ front = 4 & rear = 3 \end{array} \right. \\ \left\{ \begin{array}{l} front == rear + 1 \\ front = 0 \quad rear = 4 \end{array} \right. \\ \boxed{front == (rear + 1) \% SIZE} \\ 0 == (4 + 1) \% 5 \\ \checkmark 0 == 0 \end{aligned}$$

$$\begin{aligned} \star rear &= (rear + 1) \% SIZE \\ (-1 + 1) \% 5 &\rightarrow 0 \% 5 = 0 \\ \checkmark rear &= 0 \end{aligned}$$

$$\begin{aligned} (0 + 1) \% 5 &\rightarrow 1 \% 5 = 1 \\ \checkmark rear &= 1 \end{aligned}$$

$$\begin{aligned} (1 + 1) \% 5 &\rightarrow 2 \% 5 = 2 \\ \checkmark rear &= 2 \end{aligned}$$

$$\begin{aligned} (2 + 1) \% 5 &\rightarrow 3 \% 5 = 3 \\ rear &= 3 \end{aligned}$$

$$\begin{aligned} (3 + 1) \% 5 &\rightarrow 4 \% 5 = 4 \\ rear &= 4 \end{aligned}$$

$$\begin{aligned} (4 + 1) \% 5 &\rightarrow 5 \% 5 = 0 \\ rear &= 0 \end{aligned}$$

Rear++;