Double Ended Queue

DEQUE

- Deque or Double Ended Queue is a generalized version of Queue data structure that allows insert and delete at both ends.
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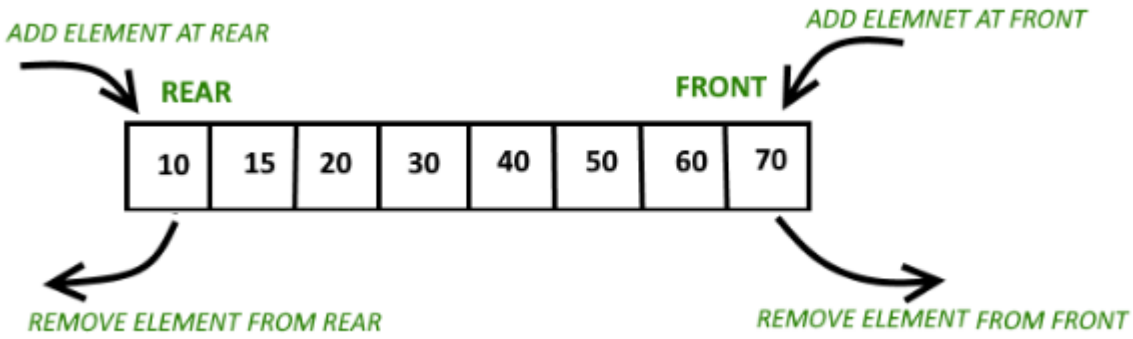


Operations on Deque:

Mainly the following four basic operations are performed on queue:

insetFront(): Adds an item at the front of Deque.

insertRear(): Adds an item at the rear of Deque.

deleteFront(): Deletes an item from front of Deque.

deleteRear(): Deletes an item from rear of Deque

- In addition to above operations, following operations are also supported
  getFront(): Gets the front item from queue.
  getRear(): Gets the last item from queue.
  isEmpty(): Checks whether Deque is empty or not.
  isFull(): Checks whether Deque is full or not.

Working

1. Create an empty array ‘arr’ of size ‘n’
initialize front = -1 , rear = -1

Insert Elements at Rear end

a). First we check deque if Full or Not

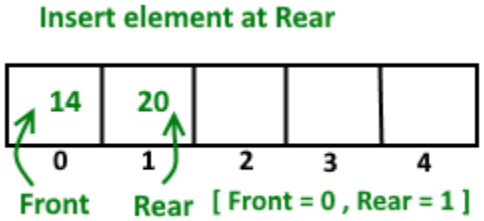
b). IF Rear == Size-1

then reinitialize Rear = 0 ;

Else increment Rear by '1'

and push current key into Arr[rear] = key

Front remain same.



Insert Elements at Front end

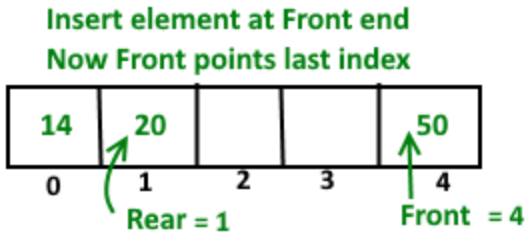
a). First we check deque if Full or Not

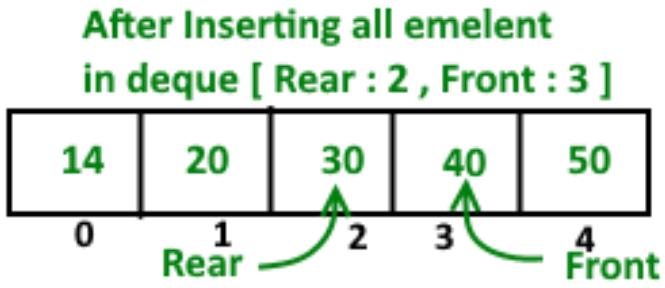
b). IF Front == 0 || initial position, move Front
to points last index of array

front = size - 1

Else decremented front by '1' and push
current key into Arr[Front] = key

Rear remain same.




After Inserting all emelent
in deque [Rear : 2 , Front : 3]
14
20
30
40
50
0
1
2
3
4
Rear
Front

Delete Element From Rear end

a). first Check deque is Empty or Not
b). If deque has only one element
front = -1 ; rear =-1 ;
Else IF Rear points to the first index of array
it's means we have to move rear to points
last index [now first inserted element at
front end become rear end]
rear = size-1 ;
Else || decrease rear by '1'
rear = rear-1;

Delete Element From Front end

a). first Check deque is Empty or Not

b). If deque has only one element

front = -1 ; rear =-1 ;

Else IF front points to the last index of the array

it's means we have no more elements in array so

we move front to points first index of array

front = 0 ;

Else || increment Front by '1'

front = front+1;