Assignment E-31.

Name: Santosh Santosh Pabihaar Class: Comp A
PRN: F2011040

8. Describe double ended queue operations.

Ans: operations on double ended queue:

1. Insert at the front:
   This operation adds an element at the front.
   steps: a] check the position of front.
   b] If front < 1, reinitialize front = n-1.
   c] Else, decrese front by 1.
   d] Add the new key into array[front]

2. Insert at the Rear:
   This operation adds an element to the rear.
   a] check if the array is full.
   b] If the deque is full, reinitialize rear=0.
   c] Else increase rear by 1.
   d] Add the new key into array[rear].

3. Delete from the front
   This operation deletes an element from the front.
   a] check if the deque is empty.
   b] If the deque is empty, deletion cannot be performed
   c] If the deque has only one element, set front = -1 & rear = -1.
   d] Else if front is at the end, set go to the front = 0.
   e] Else front = front + 1.

Q. How can we process one-dimensional array using double ended queue?

Ans: For deque we need to keep track of two indices, front and rear. We enqueue an item at the rear or the front end of queue & dequeue(pop) an item from both rear & front end.

a) Create an empty array 'arr' of size n, initialize front = -1 & rear = 0. Inserting first element from rear or front will lead to same result.

b) Insert element at Rear end.

c) Insert element at front end.

d) Delete element from front end.

Q3. What are advantages of double ended que over simple queues

Ans:

Advantages:

1) Insertion is possible through both ends
2) Deletion of elements possible through both ends
3) Elements can be accessed through iteration
4) A stack can be implemented using queue.