SACHIN PRASANNA Camlin Page
Date / / 211 ITO 58 ASSIGNMENT - 4 oneup we implemented our owner through a SINGLY linked list. follows the FIFO assignment. () on Onene () the end of a queue, One pointer (rear) Aups Hack of
the end element.

So, if we want to enquene an
element, we just have to
update the rear pointer. Updating the rear pointer take So, Worst case Time Complexity -> O(1) de anene () This function remove an element cut the quene. the front of Again the first element is referenced through a pointer, and when an element is dequeved, this pointer is updated to its next.

This again take constant time,

Since just a pointer is updated. r Again the

1 1 r the dequeved node is also deleted, which again take Constant line. 5 Hence, Worst care Time Complexity > 0(1) (3) is Empty () This function cheeps if the Onever To do this it just cheen y
the front pointer is pointing to
NULL. This again takes constant time as it is just an if condition. So, Worst Case time Complexity -> O(1) Size () r This functions returns the number element in the queue. The works on the principle of traversing the linker links We start from the front pointer and keep nowing it till the front pointer reaches the rear pointer. the exist when front pointer canals rear pointer.

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	Galed		(que	ue)	34			
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	The	Woust C	are	Time	Comple	vity ->	0(n)	
5								
		*	17	Size	of	quene	/ CL	
		_						
(3)	Display	()						
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(10)		Junitia	7	prints	all	The	element	<i>b</i>
	in V	new,						
	0 .	0	1		Jn	thayers.		
١	Sinte	elene				traverse t one	4.0	
	the					7 0014	(W)	and y
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(2)	D.	Que						
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	W/10	can	do	more	•	operation	'm	
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1	en Ou	ene Front	()					
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-	eleme	ut in		he !	beginn	y of	. Yne	
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1	deque.
	That is if we are investing
	that is if we are inverting
5	a new Node, this new Mode
	a new Node, this new Mode will be come the new
<u></u>	front of the queue.
1	This operation of making
10	new Mode -> next = front
	front => prev = new Mude
I	front = now Node,
	A 1 A
	All take constant time.
15	
	So, Worst (ate Time Complexity -> O(1)
	D
(2)	en Overe Rear ()
20	
	this function inserts an element
-	in the end of the deane
	The Australia I
,	The pointer rear which Reeps
25	track of the lost node,
,	needs to be updated to the new Node itself.
	remadule of sey.
	And Visably the nounced to
30	And finally the new Noclo becomes the new rear.
33	new year.
	rear -> nept = new Nodo;
	new Mode -> frev = rear;
	rear = now Mode,
	All this take constant time.

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	So Worst Case Time Complexity -> O(1)
	$\longrightarrow \mathcal{O}(1)$
(3)	de onene Front U
r	This your than you
	this function ranows the Hist element of the deque.
	y me deque,
	As before usle to
	As before when the first element
10	is removed, front is not noted to its subsequent element.
	to its subsequent element.
	Now day
-	Now, the deanened element is
	deleted (treed).
15	
٢	All this takes constant time,
	since only pointers are being
	altered.
	,
20	Se, invoret lase Time Complexity -> O(1)
4	de Onene Rear ()
25	This junction remove the last
	element of the degree.
	V
F	In this case, the rear
	Drinter of the pointer which Reeps
	tracks as the last element) is
30	pointer (the pointer which feets tracks by the last element) is moved to the previous element. The element preceeding it).
	1 Has element preceeding it).
	(int
	Similar the element to be dequeued
ſ	i deleted (freed).
1	y aller

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	A his hard and hard the hard t
F	
	Since only pointers are being altered.
	So, Worst Case Time Complexity -> O(1)
T	
(5)	Sile ()
<u></u>	This Function returns the number
	of element in two deque.
]	3 + 1 1 1 1
	the works by traversing the deque and stops when
	home of the state
15	rear pointer.
	porta or .
	Since traversing is an o(n)
	Since traversing is an O(n) time operation,
20	
	World Case Time Complexity -> O(n)
J	r→ Size of deane
(6)	is Empty ()
	4, 6, 1
	this threston cheeks whether the
	deane is empty.
r	If front == MULL, then
30	
	it is not empty.
<u></u>	
<i></i>	Since it V just an ig
~	operation,
	Morst lose time lomplevity -> 0(1)

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					. , ,		
3	au sp	lay ()					
~	Hus	t fre	^	print	all	The	
5	elenen	t fri	bent	in	the	dequ	n€.
F	We	traverse		thremat	ea	O.	clem on t
	and	traverse	'vŧ		This	ù,	0 (n)
		nateux.					
10	Se	Money	///	The	(00.4	louit	→ O(n)
	36)	X((OB))	Cope	1(mg	on p	lerly	3 O(11)
				r	· -> 5)	se of	deaup
15							20
	\times	X			X		χ
20							
25							
30							
30							