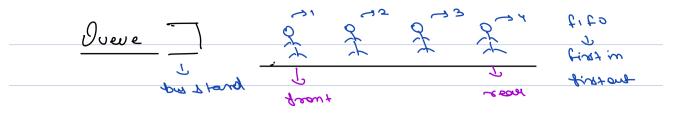
Today's Content Queue • Implementation of the queue using array • Implementation of the queue using stack • Perfect Number Question • Doubly ended queue Sliding Window Maximum م) لحو Push Stack



functions of Queue

1) Enquere (x):- or will enter as the reas End.

2) Deque (): - femous an element from front end,

. One front to tramele use soil -: () + nort (E

us lease coi. - cives you element at rease end.

Implementation of Owner

1) become :-

214

8, 14, 9, 50, 7, 30, grans (), 1, reconcs, 60, 7, 5, 10

8 JY 9 20 30 60 5 10 15

85 140 915 20 30 60

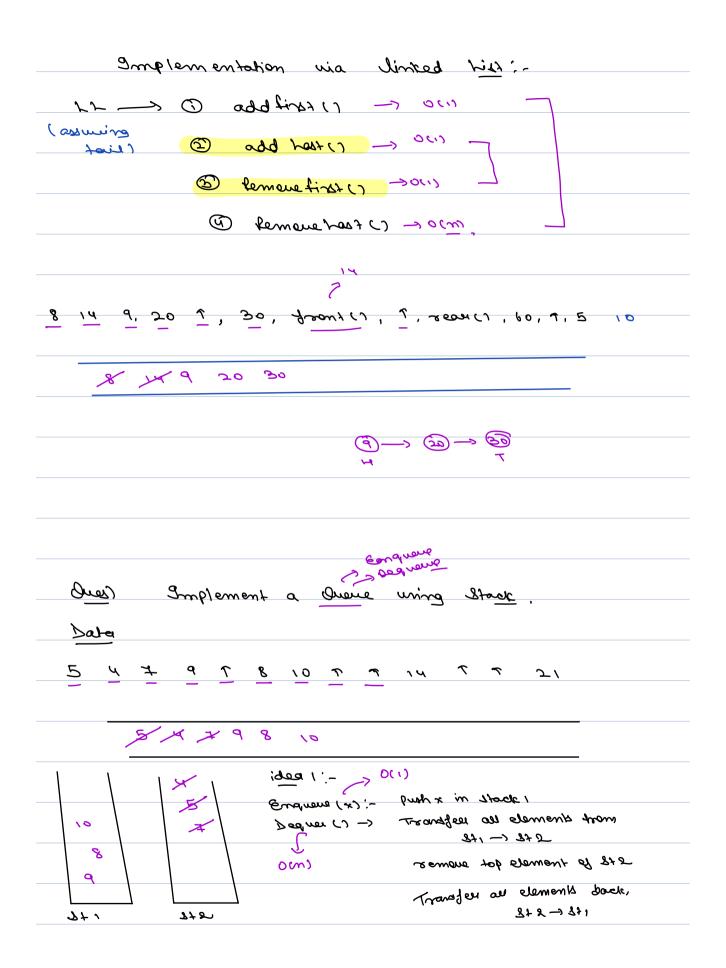
front = -X & 1 & 3

11- = + trange + mi

int read = -1.

int size = 0;

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                                   ancesan3= x
quant = 0;
    if ( Dize = = are. 1en ) { (or (+1)==trons)
          , elle f: suend nember
       read ++ , read = read 1. m; Dirett'
       are Cream 2 - x ",
Leque Cs &
     if (line = = 0) & redum " Onere is Euply "3
      Ctront Juses : gust
      geout ++;
       growt = frong. " " give - - "
       "gust newlere
Problem: - Queue Jen is fixed
   - Dynamic Array
                                 du p sw
     ful, create a new
      double len array,
      copy all evilting
        elever & we it.
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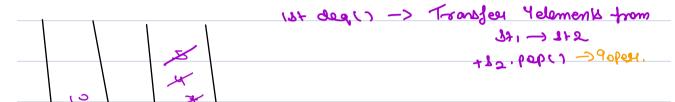
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B X X 9 8 10

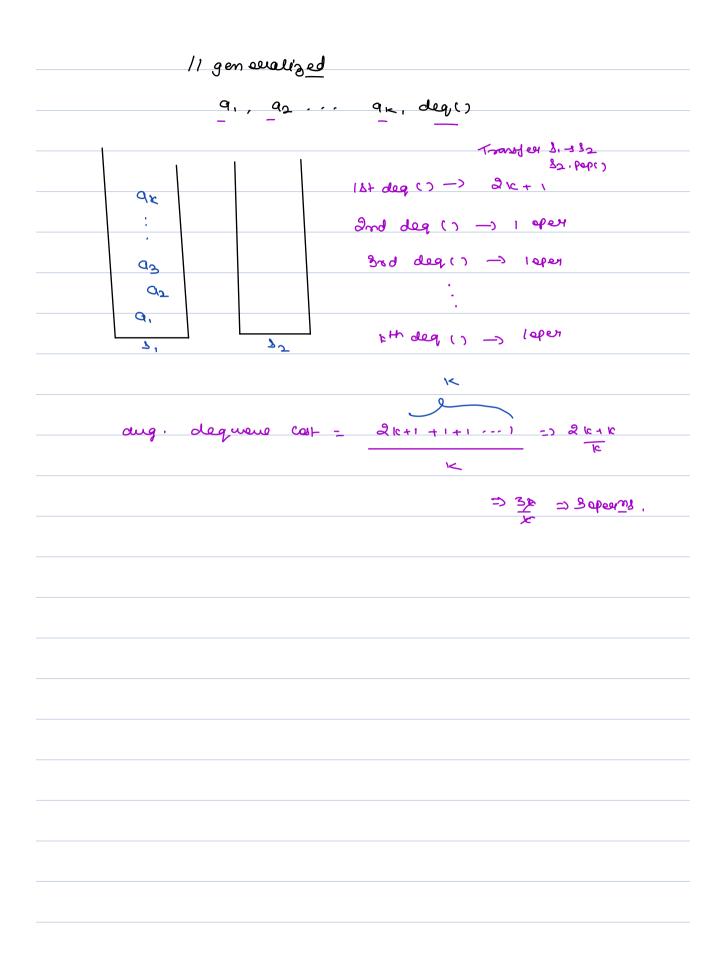
7+5

7+1



2nd deg() -> repen 3rd deg() -> repen

dequeue -> amortized O(1)



tind num fear ject number 1 museus using dign't 1 or 2 (1) (2) (2) (2) (12) (22) k=9. -> 121 11 <- 8 = 2 k= b -> 22 titi shed , usedwan loventom & Browle forace :too digit (or 2. -> find but no. Recordion - 2FL (B\$1) (Broadh First Dearch) Lipsil Onone respect land) 2 gialit > 21 (So been word 22 211 221 212 122 112 121 K = P 1122 1111 no. of insertion = 2 x 6 Y X JX JX JX

I (1 th owners (int x) &
Quous < string > 9', moved insertion : 2',
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9.0dd (2),
forci=1,1< 10,1+4) &
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d'esumer).
2008 9. add (ele+"" "+17")
if (mo.d. inserpos < 2) { 9. add (ele + "" "+2); 9. add (ele + "" "+2);
Leint (d'Asant (1),1
Leint (d'Asout (1),1
3
1.C-) O(W
1 ·C → O(k)

andly wh Doubly Ended Queue (Deque) rees imbert ~ sease (); imbert - trant (); grow are - read (), remove - front (), gream ()', front()',

Civen are too 1 9 k, print more dement in every mindow of lize ks; are [a] = 10 1 9 3 ± 6 5 11 8, k=4 Brule force: — 4 window of lize k, Travel & find Marin, Therefore 10 1 9 9 ± 11 11 And 10 9 9 ± 11 11 Therefore 10 (m²) 10 1 2 3 ± 6 5 12 4 5 6 ± 8 9 10 11 12 15 12 4 5 5 9 15 15 6 12 4 5 10 9 10 7 2 5 5	Ours D'iding Mindors Mosm
Brule force: _ & window of size k, Travel & find Many Brule force: _ & window of size k, Travel & find Many T.C => 0 (m-k+1) * k Lunchen k = m2 mo of subarrays 0 (m²). of hize k, size i = k+1 = 10 inch k lan 2 inch k lan	
Brute force: — $\frac{1}{1}$ window of line $\frac{1}{1}$, $\frac{1}{1}$ when $\frac{1}{1}$ and $\frac{1}{1}$ when $\frac{1}{1}$ when $\frac{1}{1}$ and $\frac{1}{1}$ when $\frac{1}{1}$ and $\frac{1}{1}$ when $\frac{1}{1}$ and $\frac{1}{1}$ when $\frac{1}{1}$ and	
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Brute force: _ V window of size k, Trawel & find Moom. T.C -> 0 (m-k+1) * k wahen k = m word subarrays o (m²). d hize k, 2 i-2+1 = 10 i-2+1 = 10 i-2+1 = 10 2 i-3+1 = 10 2 i-2+1 = 10 2 i-3+1 = 10 2 i-3+1 = 10 3 i-3	4-4 8 11 6 B 1 01 - CPJ&D
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Mosem. 1.c -> 0 (m-k+1) * k 1 when $k = m_2$ morely submany of hize k, $\frac{1}{2} = \frac{1}{2} = \frac{1}{2} = \frac{1}{2} = \frac{1}{2} = \frac{1}{2} = \frac{1}{2}$ $\frac{1}{2} = \frac{1}{2} = \frac{1}{2}$	Brute force '- 4 mindows of lize to Travel E. tind
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<u>S 15 6 12 4 3 10 9 19 7 2 5 9</u>	
	0 1 2 3 4 5 6 7 8 9 10 11 12
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<i>6</i> <u>−</u> <i>−</i> ,	<u> 1 3 4 5</u>

- C] mp	0 1 2 3 B 15 6 12	4 5 6 7 8 9 10 11 12 4 2 10 9 13 7 2 5 3	
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<u></u> <u></u> <u>8</u> 18	B XXXX	10 9 15 × 26 5 5	
		100000111000 Alma	
		removing from Start	
		8-4=7	
o 9	, 2 3 4 2 8 4 5	5 4 5 2 E=4.	
<u>*</u>	28485	<u>5</u> 2	
	y 5 6 5 5	5	
		<u> </u>	

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brint (d. phontess); brint (d. phontess); d. emone - rearces; d. interf-rearces; d. interf-rearces; d. interf-rearces; d. interf-rearces; d. interf-rearces; from one - rearces; from one -	[c) readile (', q, is Empty () & & [q, readil)
q. insert-reserving q. insert-reserving print (q. tront ());	1
Print (q. tront ()); for (i > k to m - 1) & while (', q. is Empty () & & A (q. reason) <pre></pre>	3.2emone - 2 conc),
Print (q. 4ront(1)), Print (q. 4ront(1)),	d'inport-coorcis,
for (i + k to m-1) {	_3
(3 (4. pront(1); d. remone - pront(1); d. remone - pront(1); d. remone - pront(1); 2 (4. pront () = = 1-10) & Lean (); 3 L. C > O(W)	beint (d. thont ()),
(3 (4. pront(1))) (3 (4. pront () = = 1-10) g (4. pront () = = 1-10) g (3. semone - pront(1)) 2. semone - pront(1); 3 (4. pront () = = 1-10) g (5. (4. pront(1)))	
2. C= 0(W) Server (d. front()), (f (d. front () = 1-10) f (1. Leavent - early), 2. Leavent - early);	for (i→ k to m-1) {
1. C= 0 (w) 2. C= 0 (w) 2. C= 0 (w)	while C. q.is Empty () & & D Tq. reasons
S (3 (d. pront () = (-10) g (3 (d. pront () = (-10) g	
(3 (d' pront () = = 1-10) g	
q. remove - trant(); print (q. hront()); 3	a.insert-eonicis;
q. remove - trant(); print (q. hront()); 3	€ (21-1 = = 1) troop(,p) };
2 Print (a. Aron+(1);	
print (q. hron+(1);	d'emone - 11014()
J. C = 0 (m)	3
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and the control of th	$9.0 \rightarrow 0.0$