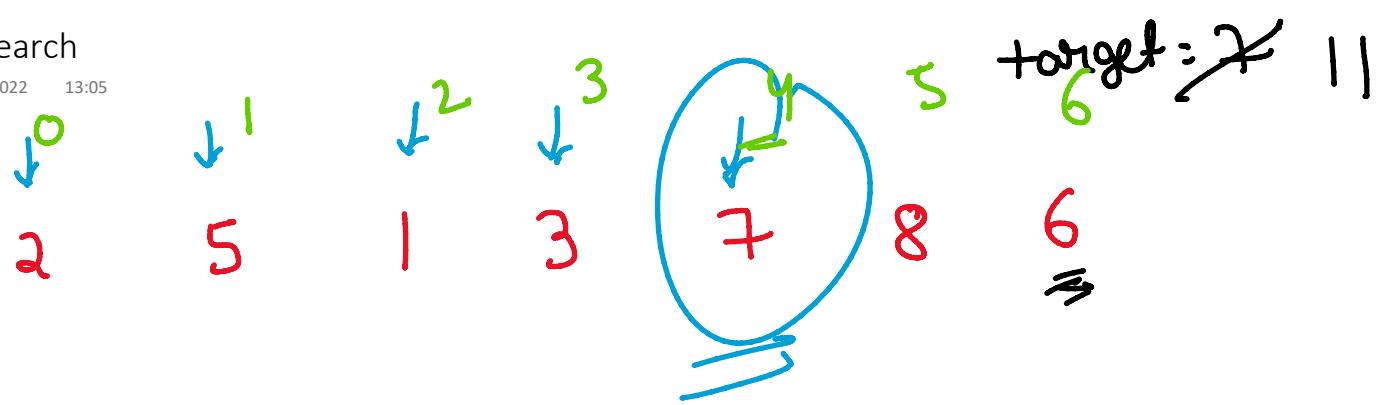


Linear search

10 September 2022 13:05



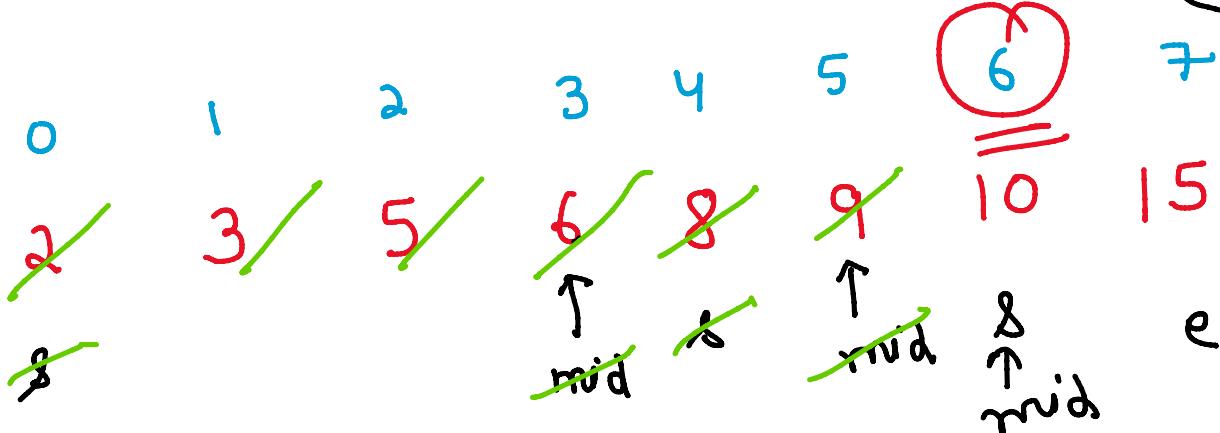
$\text{index} = 4$
-1

Binary Search

→ array should be sorted

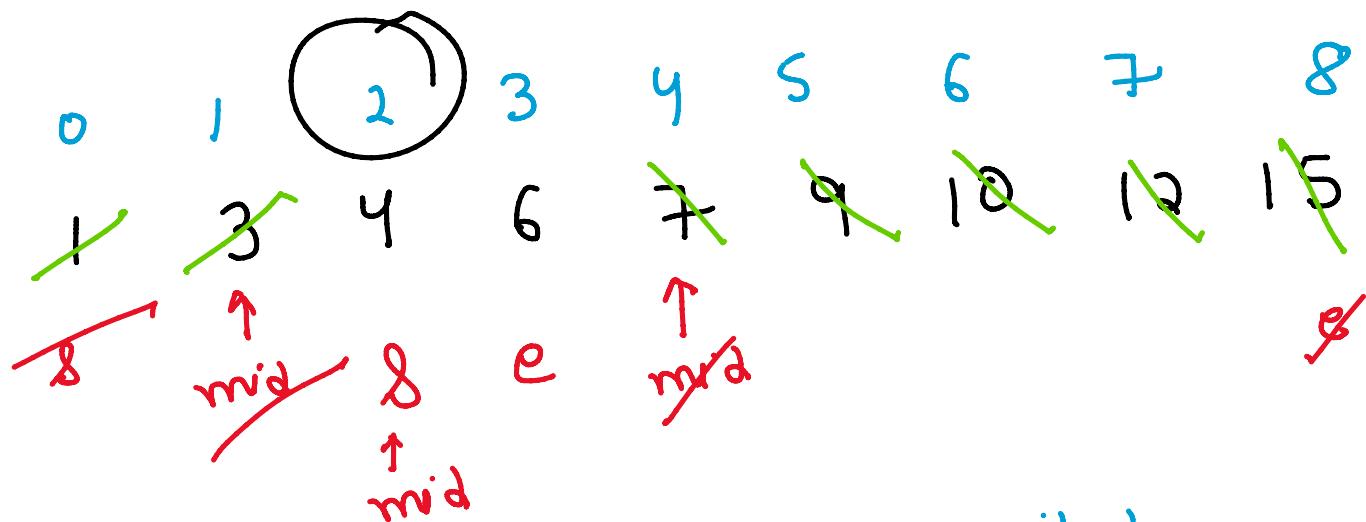
target = 10

log N



$$\text{target} = 4 \quad \text{mid} = \frac{(s+e)}{2}$$

$$g = mud + 1$$



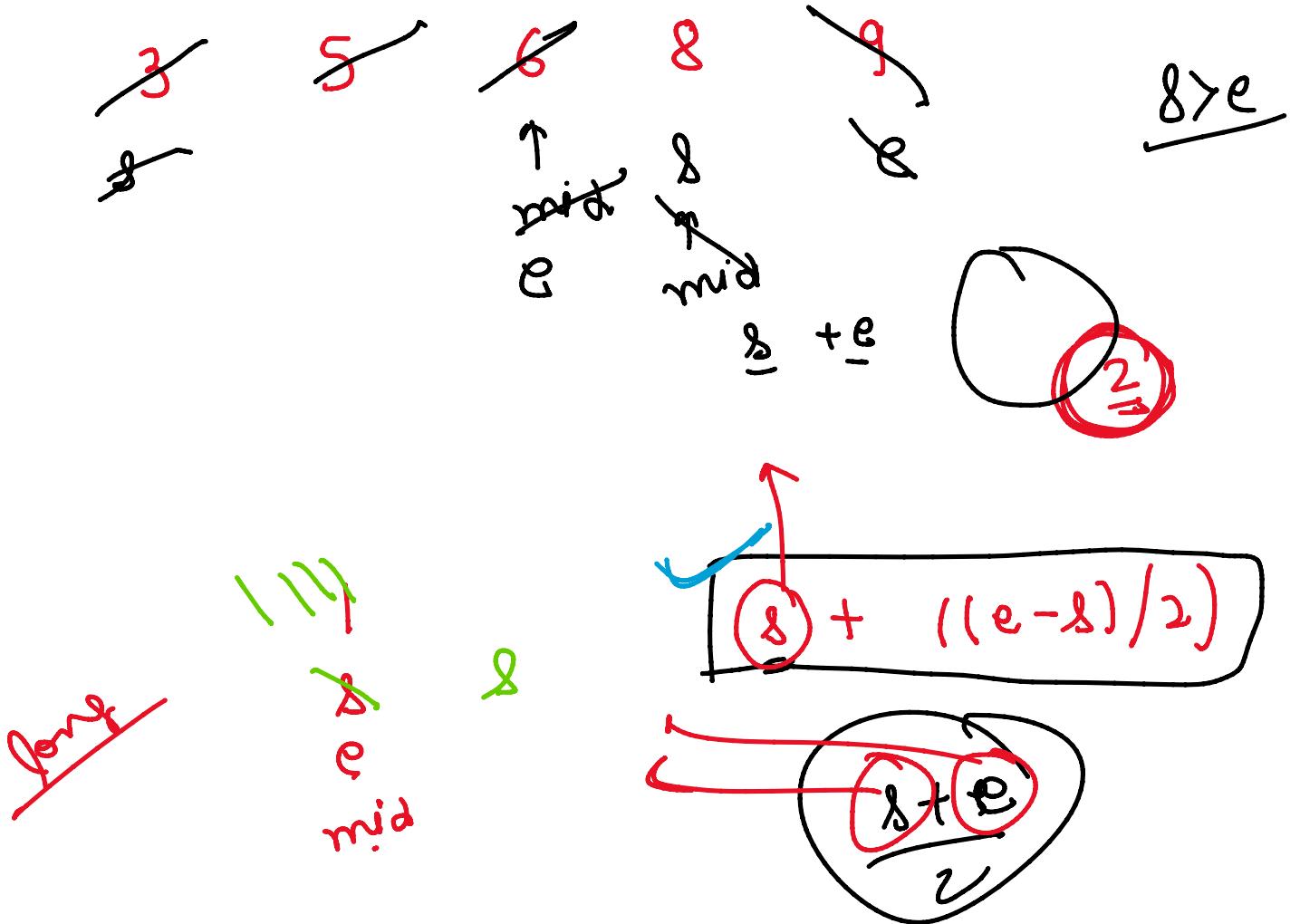
$$\text{integ} = 2$$

$$e = \text{mid} - 1$$

$$\delta = \text{mid} + 1$$

target = 7





First and last occurrence of element in sorted array

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~~target = 9~~
~~first = 8~~
~~last = 8~~

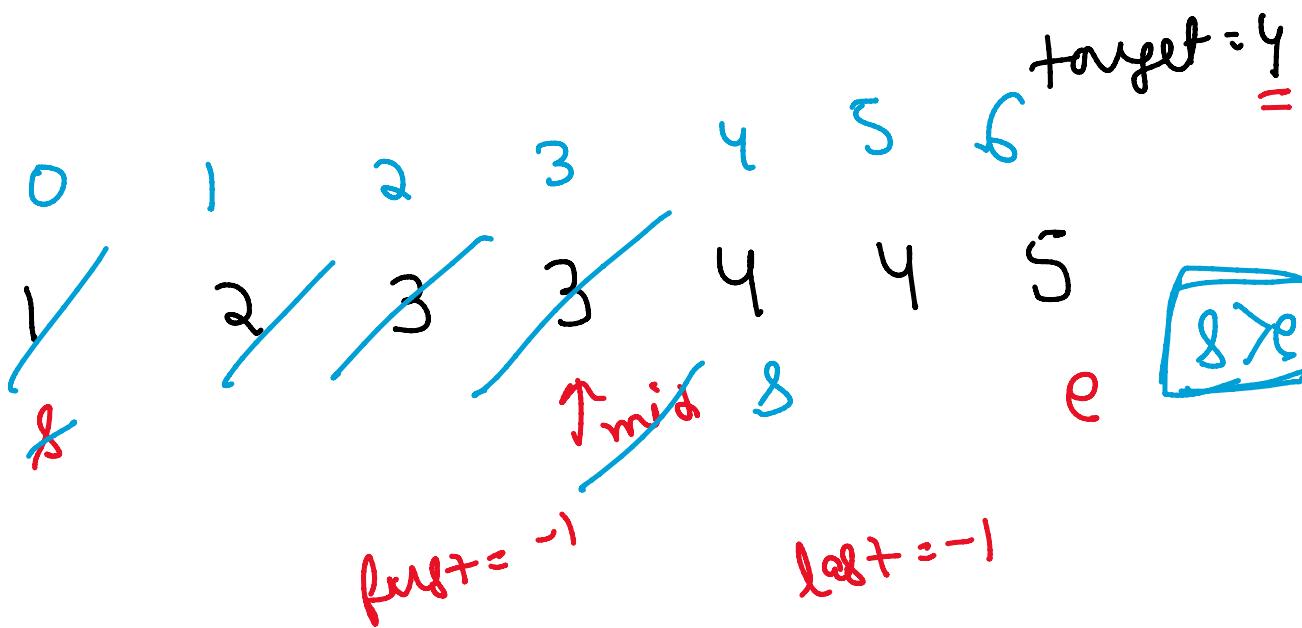
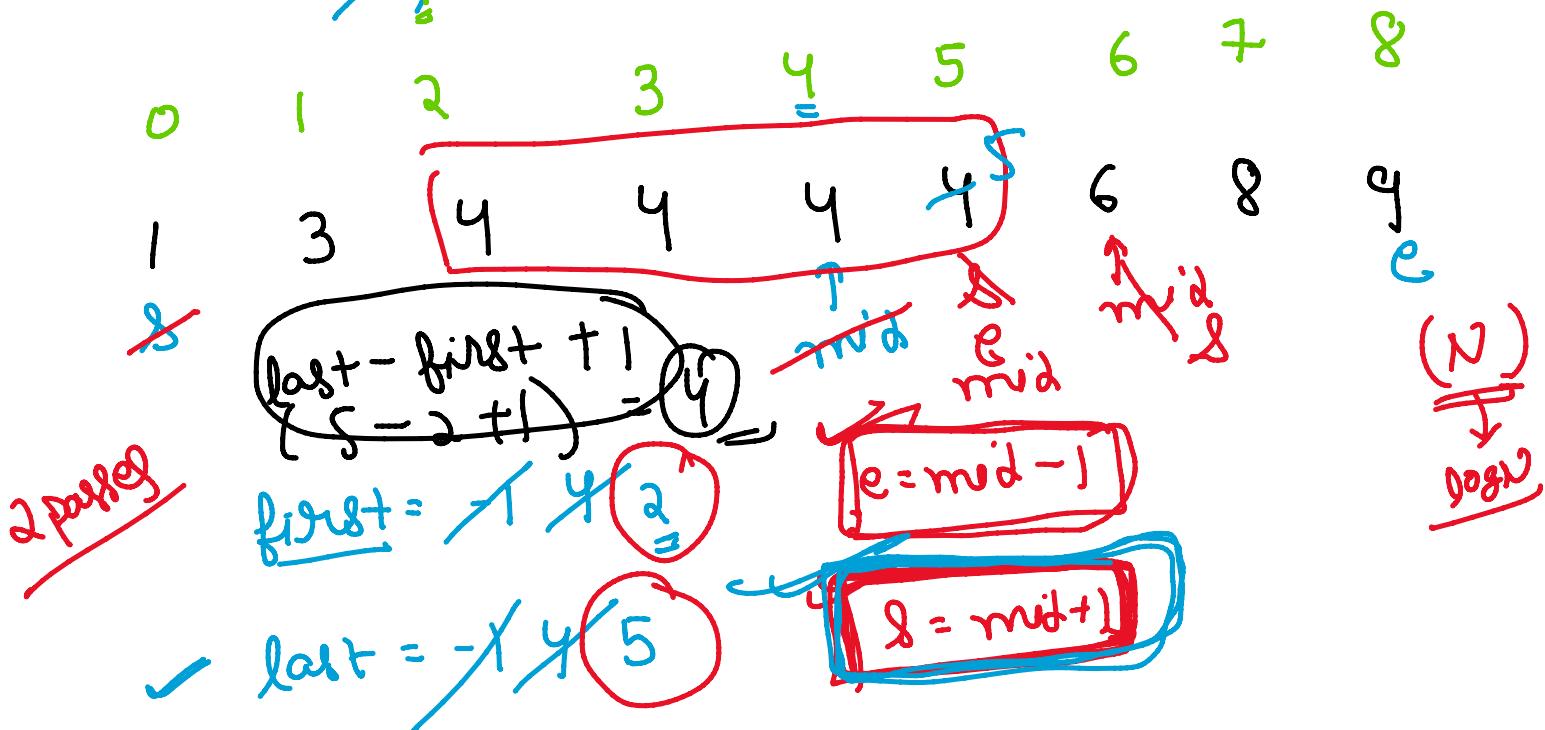
~~frequency = 3~~

frequency = 3

first = 2
last = 5

target = 4

Binary search?
Two pointer approach

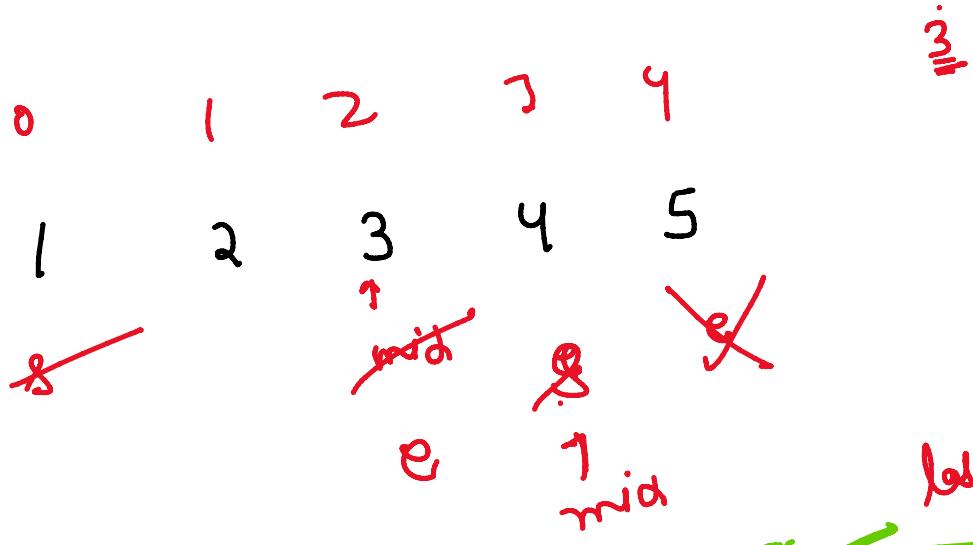


sort

$N \log N$

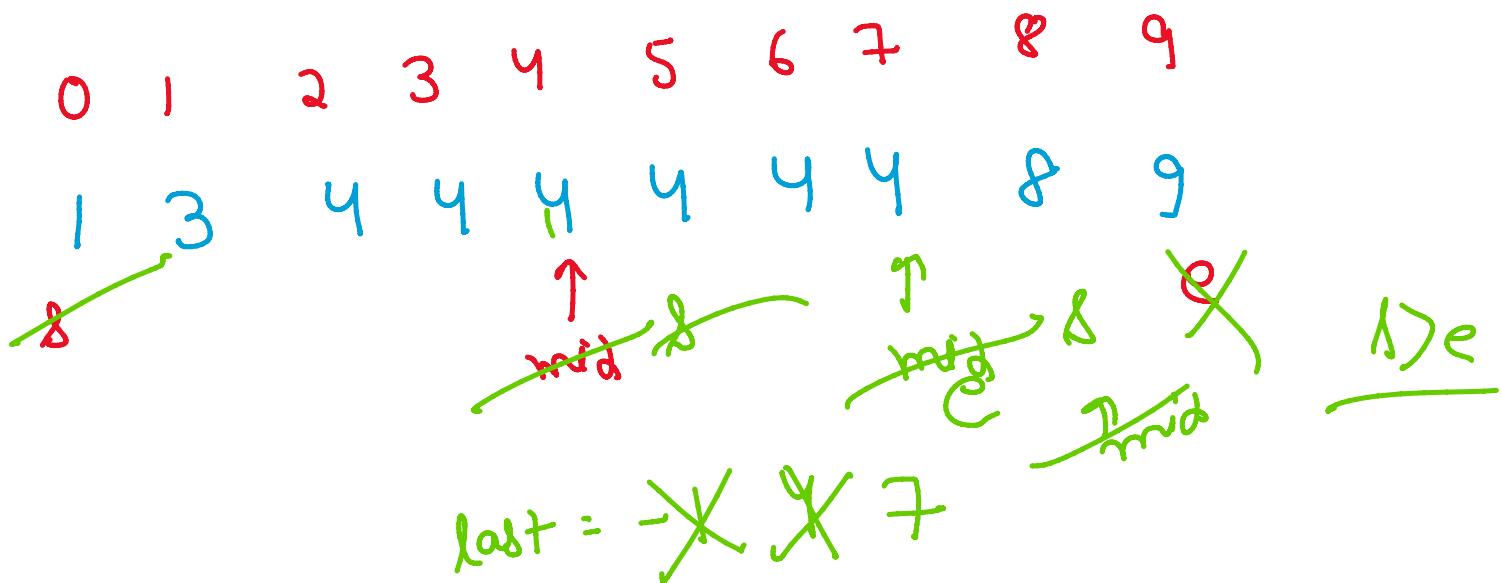
linear:-

N



$$\text{last} = 8$$

$$\boxed{\text{last} = \text{mid} + 1}$$



$$\text{last} = 8$$

$$\boxed{\text{last} = \text{mid} + 1}$$

Square root (x)

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$$\begin{array}{r} 16 \\ \downarrow \\ 4 \end{array}$$

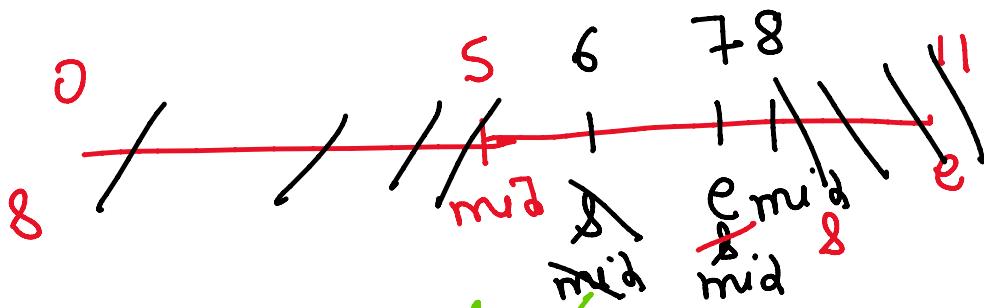
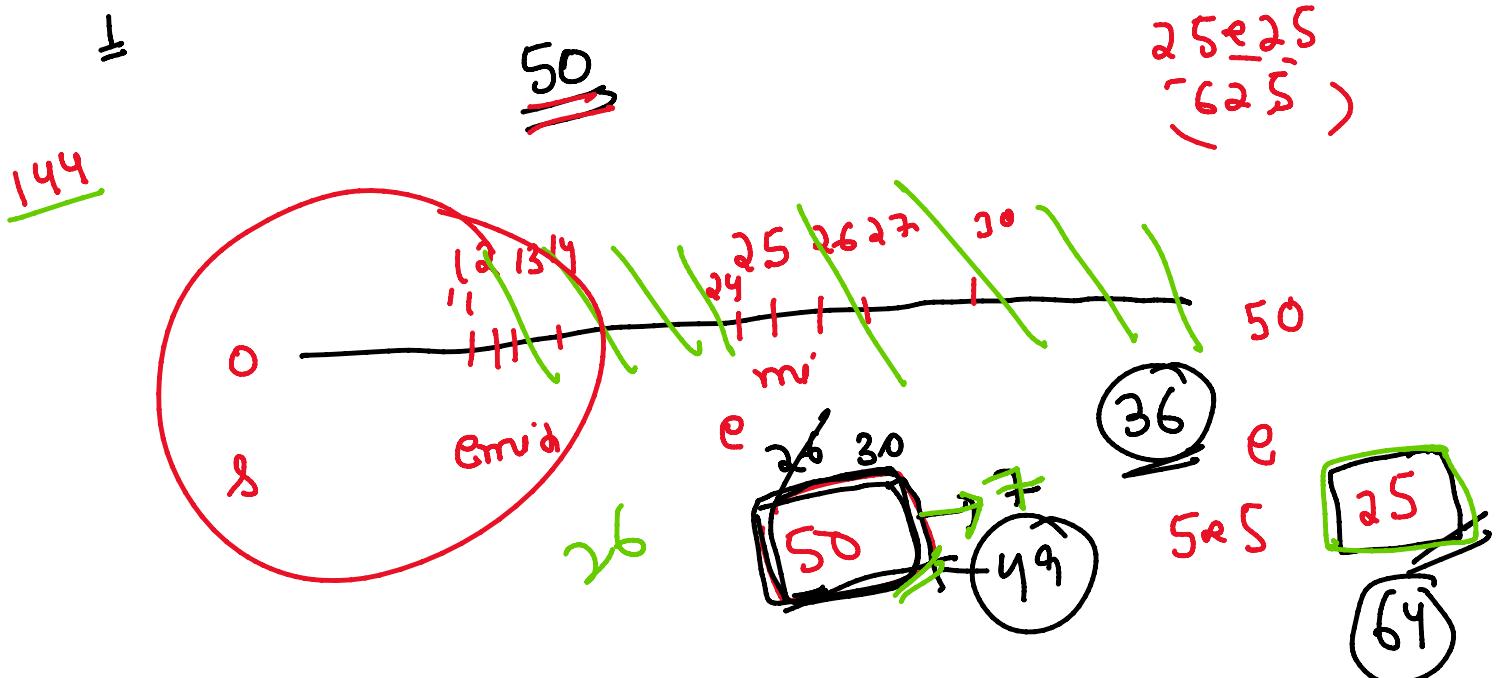
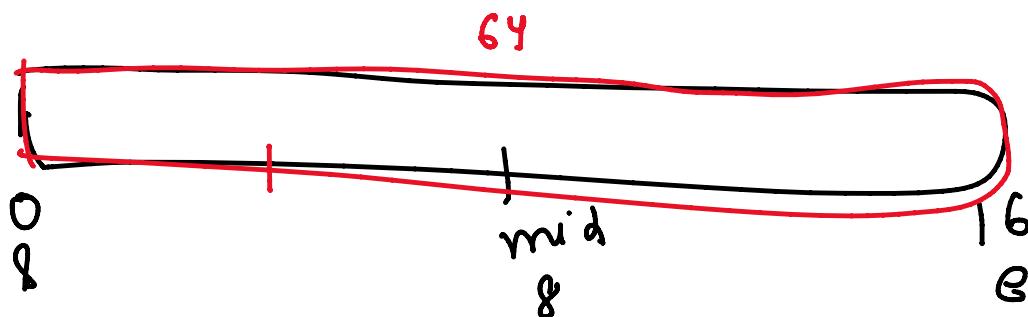
$$\begin{array}{r} 25 \\ \downarrow \\ 5 \end{array}$$

$$\begin{array}{r} 50 \\ \downarrow \\ 7 \end{array}$$

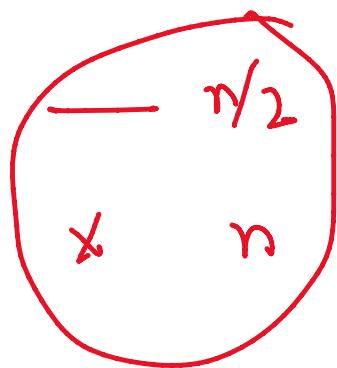
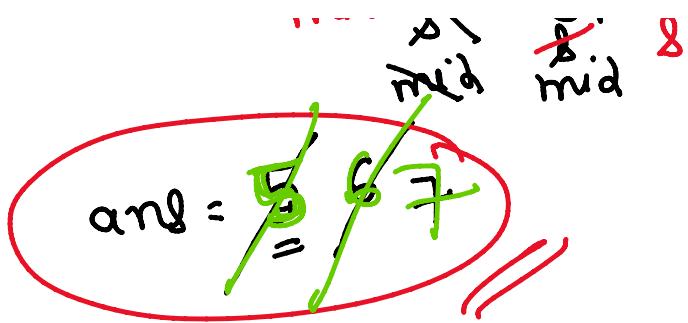
$$\begin{array}{r} 90 \\ \downarrow \\ 9 \end{array}$$

$$x = \underline{16}$$

~~$\log(N)$~~
 ~~(N)~~ !

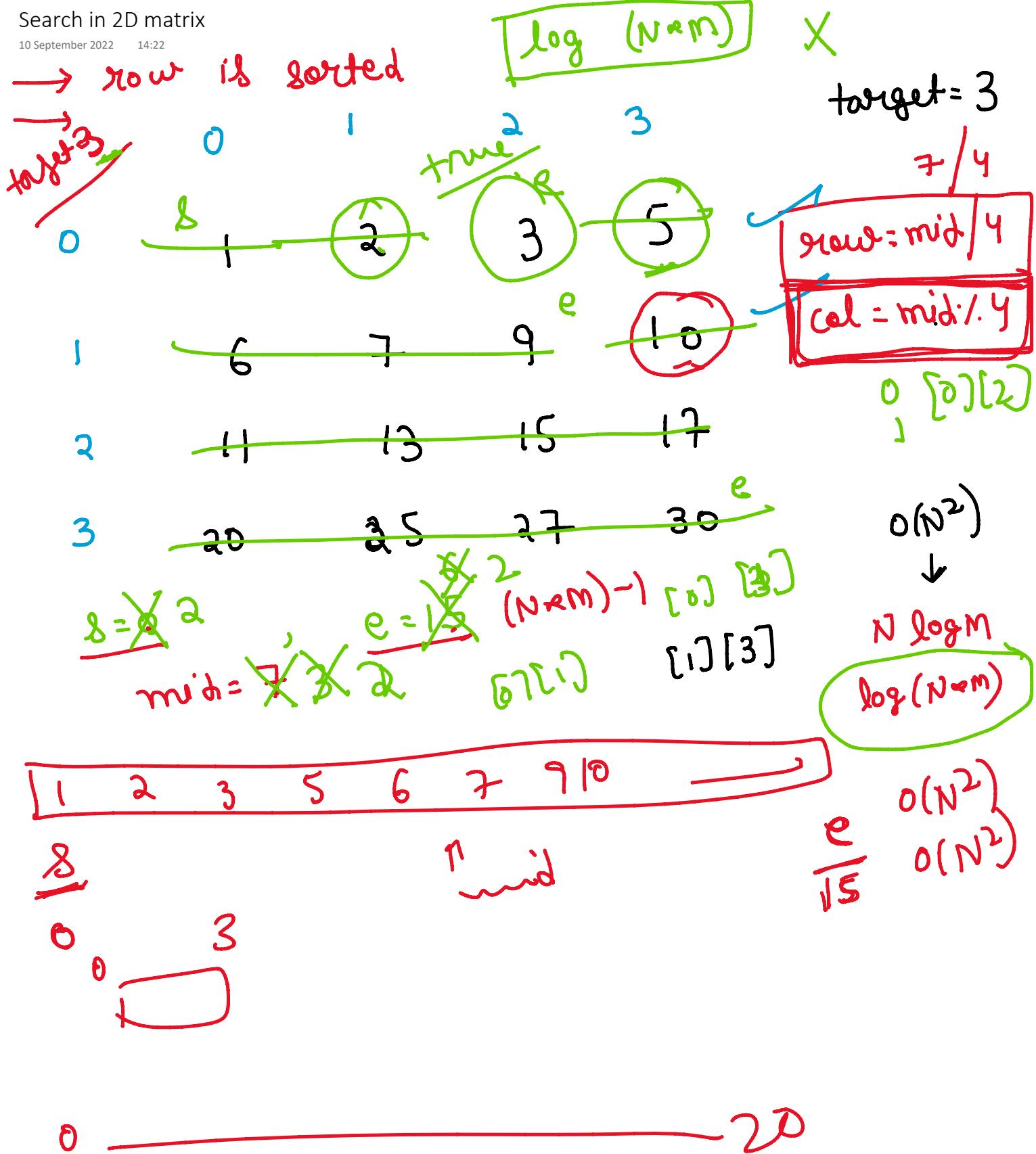


0



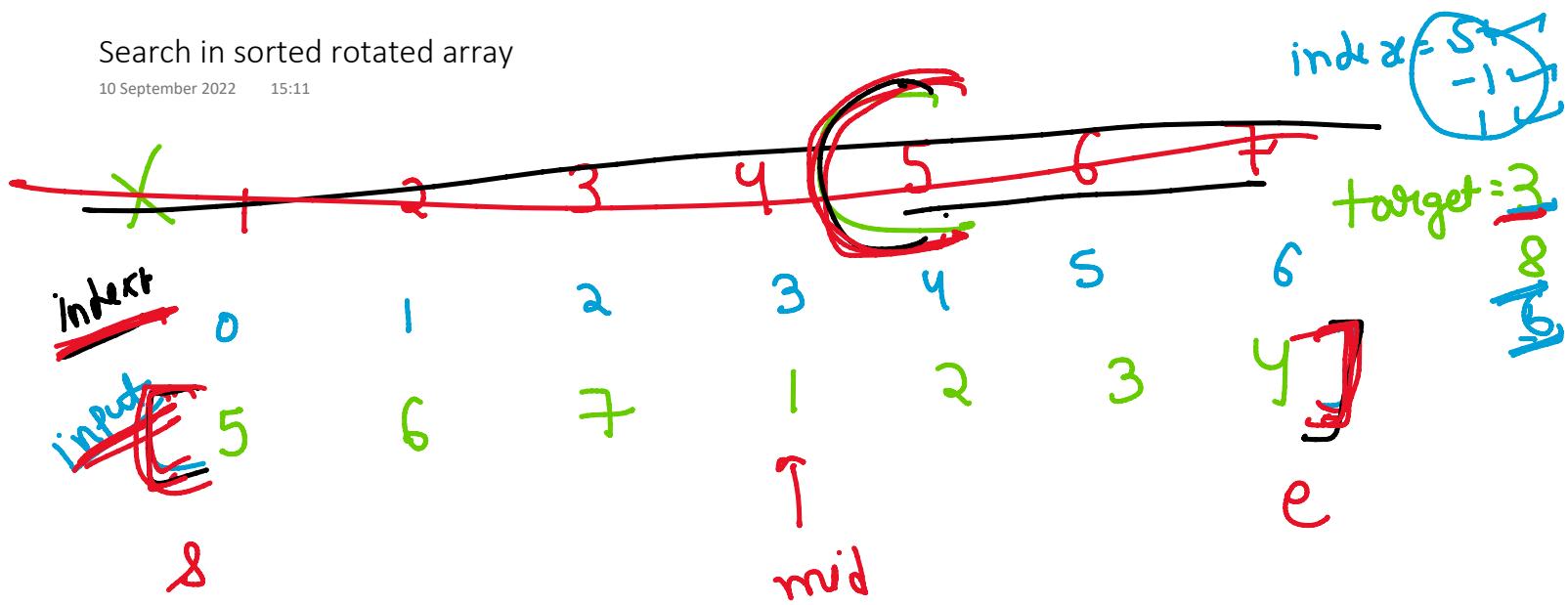
Search in 2D matrix

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Search in sorted rotated array

10 September 2022 15:11



- greater than mid and less than end
- less than mid left

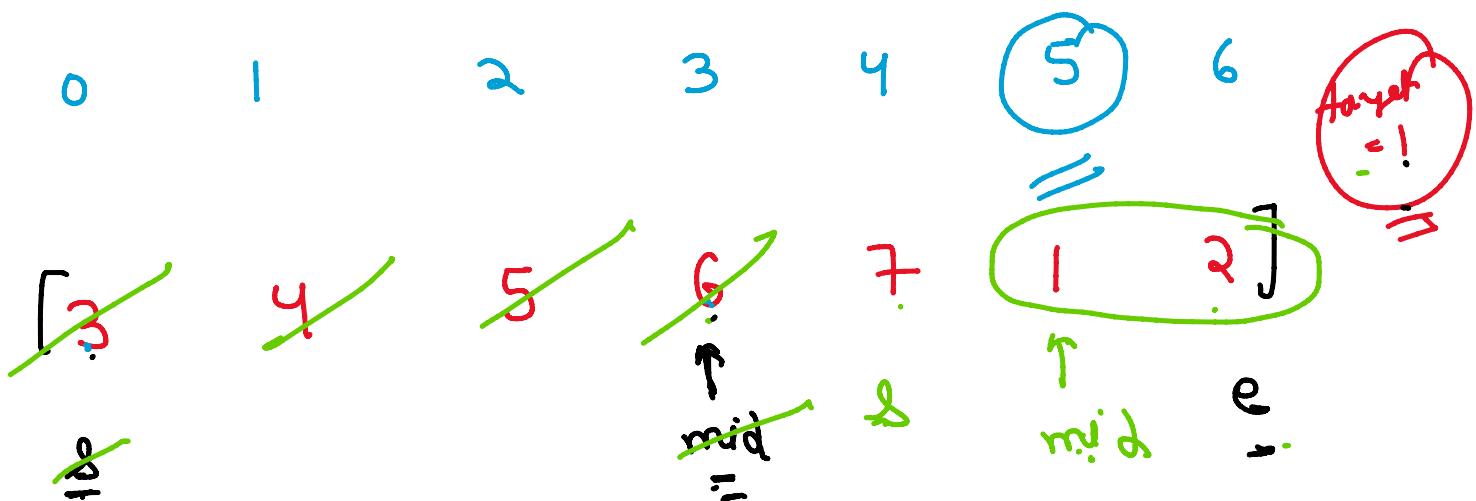
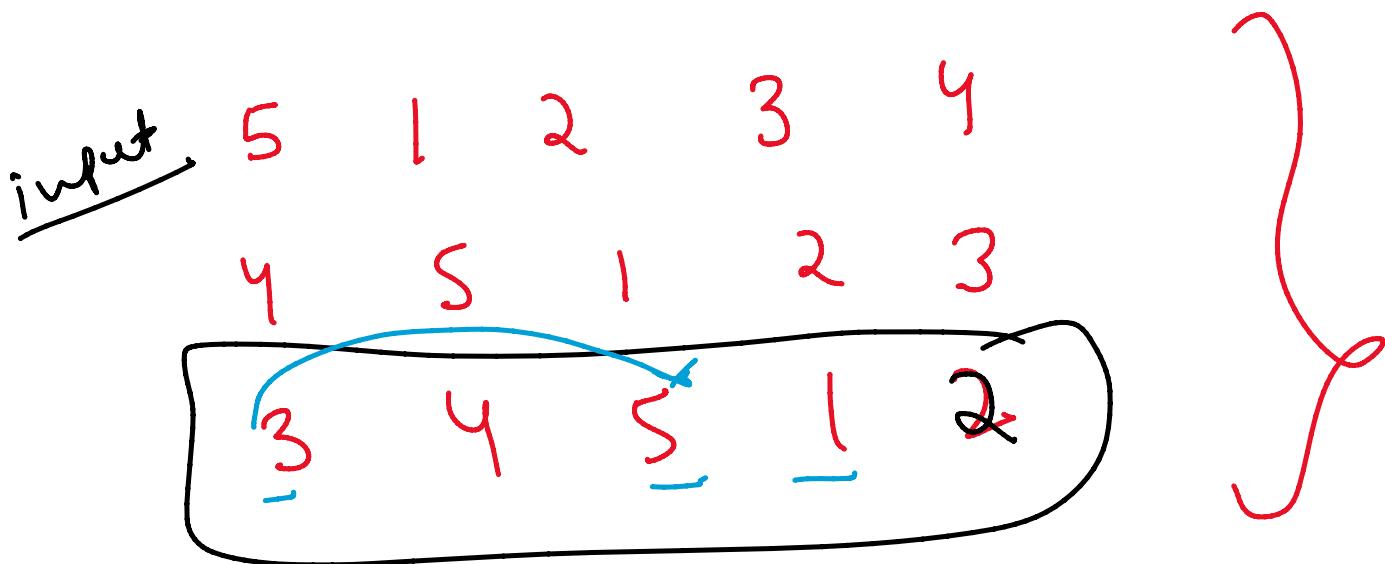
~~O(N)~~
↓
~~O(logN)~~



?
! index !
work

X, , , , ,

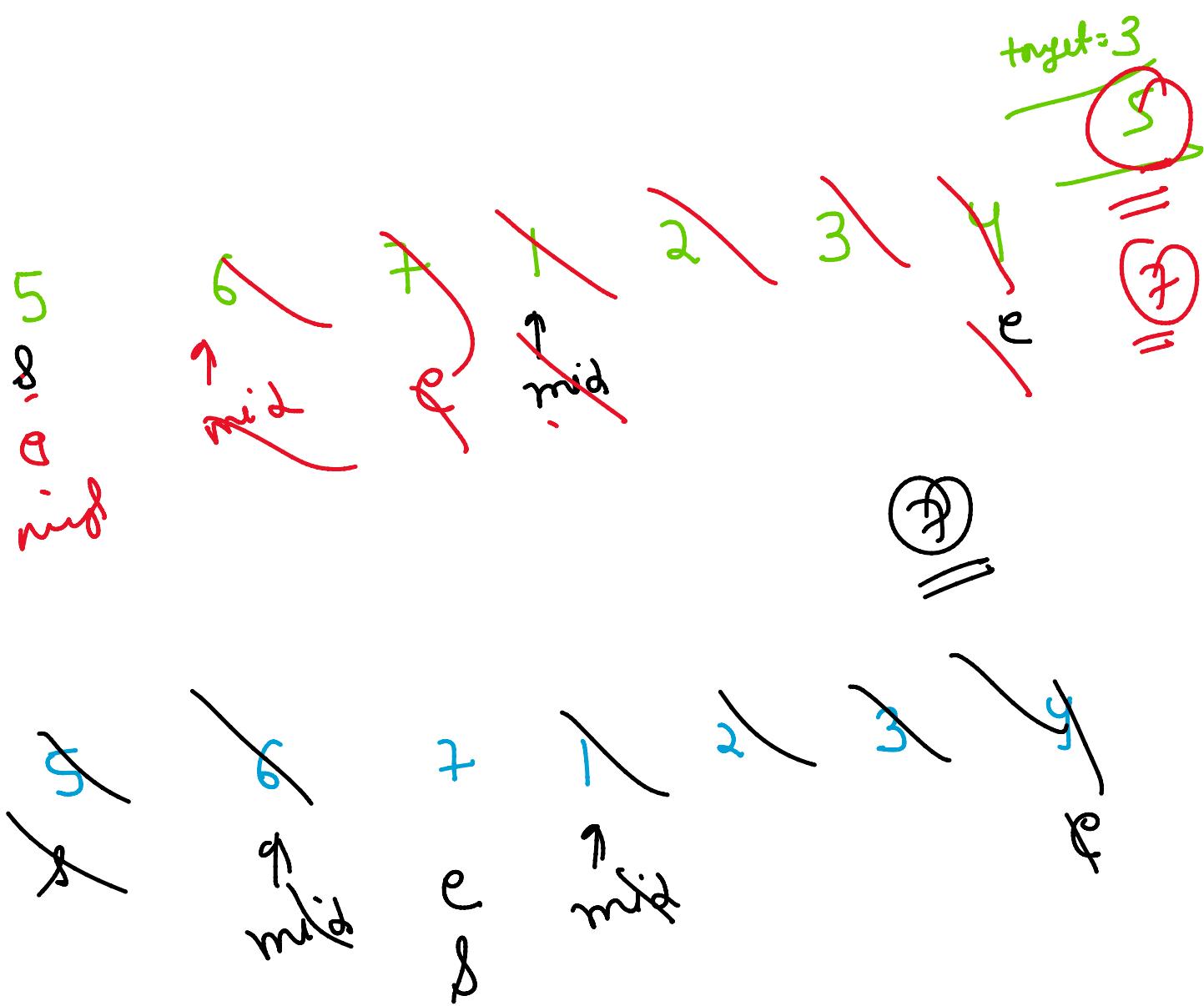
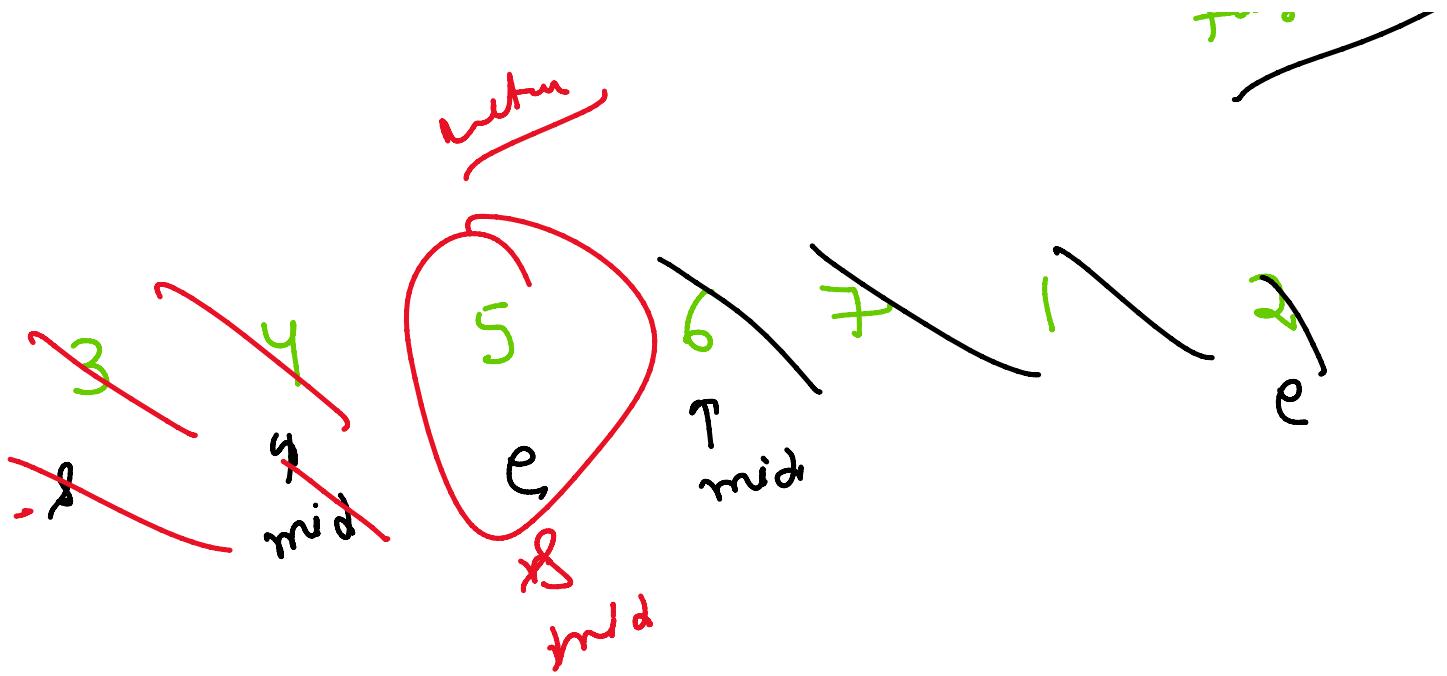
x 1 2 3 4 5

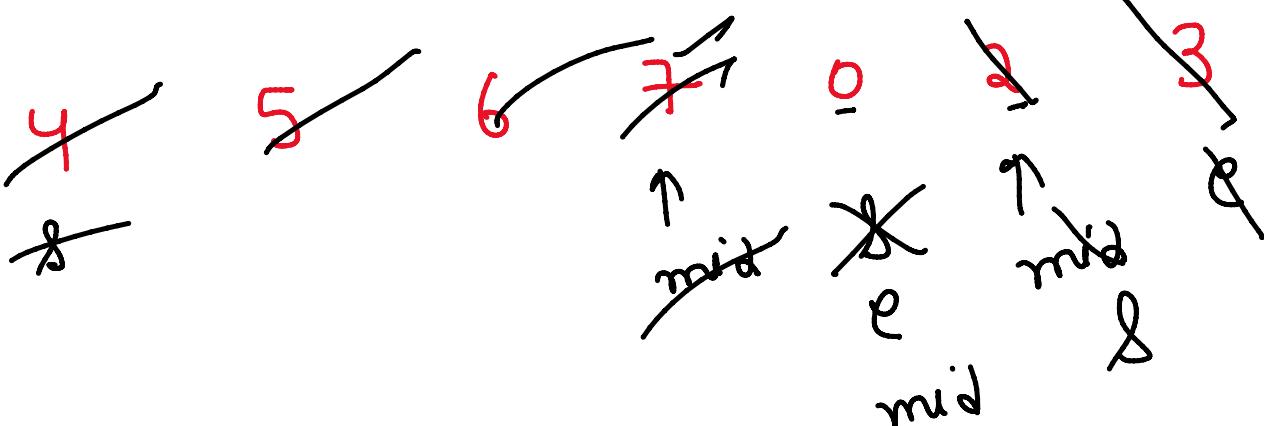
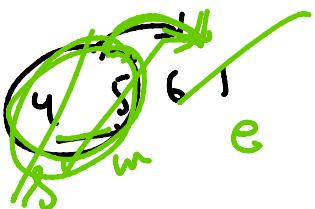


$$l \leq mid \\ (l \leq \text{target} \leq mid)$$

then,

$$\text{mid} \leftarrow e \\ (\text{mid} \leq \text{target} \leq e) \\ \text{target} = 5$$





O - O

- ① Check for sorted half
- ② Check whether element lies in sorted half or not
- ③ Adjust (l, e)

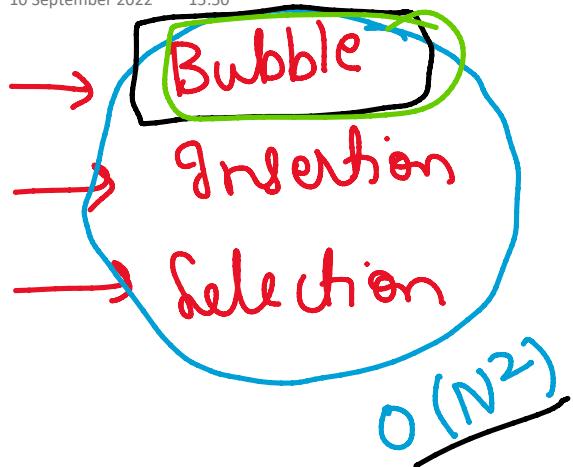


- {
- ① Single element in sorted array
 - ② Peak element in array
 - ③ Relocate min number of pages (6FA)

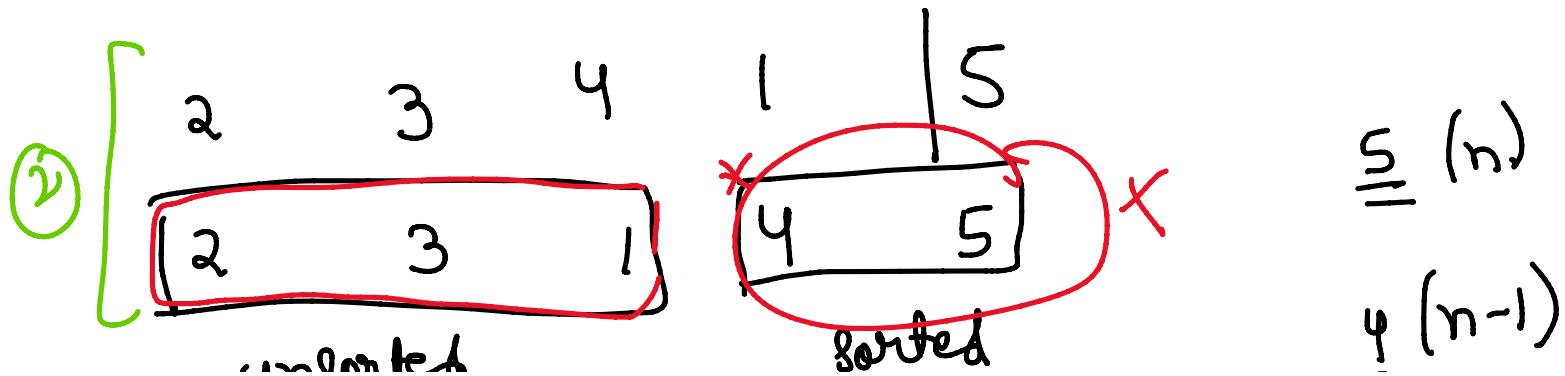
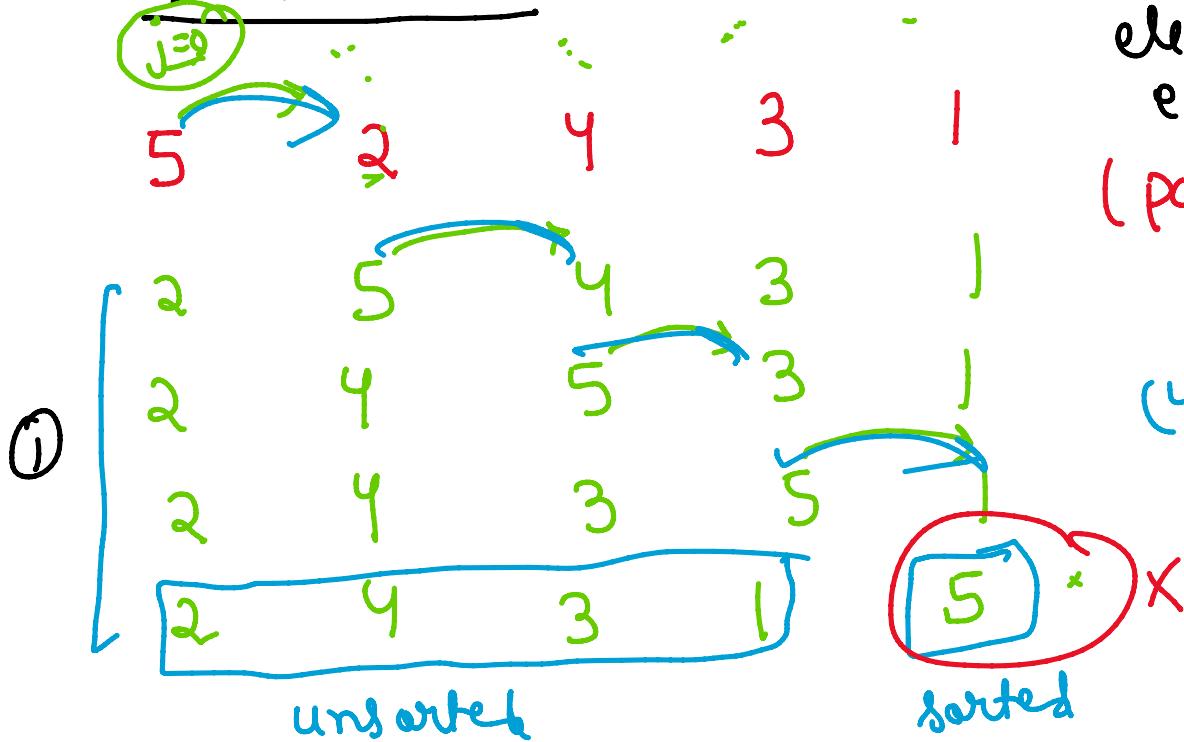
Sorting

10 September 2022

15:50



Bubble sort +



unsorted

sorted

$$\underline{4} \quad (n-1)$$

③

2

3 4 5

// no. of iteration

for($i=0$ to $i < n-1$)

// pairwise swap

for($j=0$ to $j < n-i-1$)

{

 }

 }

④

2 3 4 5

sorted

// iteration

0, 1, 2, 3

5

4

→ for ($i=0$ to $i < n-1$)
 // pairwise swapping

 for ($j=0$ to $j < n-i-1$)

{

 swap(i)

 2 problems. (in.

C++

sort(arr, arr+n)

Javq

Arrays.sort(arr)

vectors.

10 - 15 min