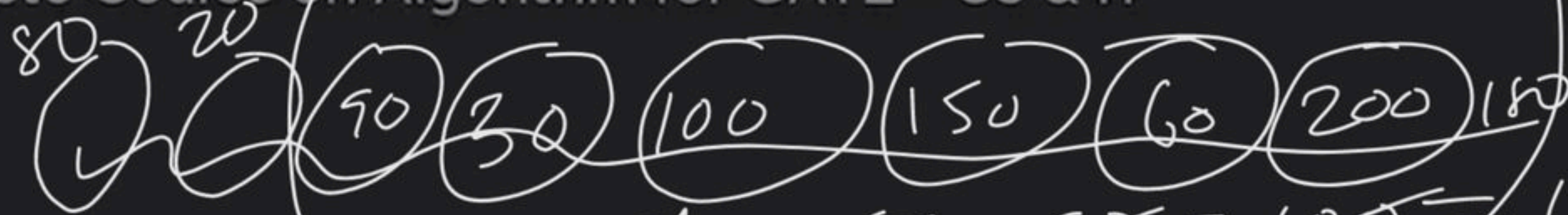


Doubt Clearing Session

Complete Course on Algorithm for GATE - CS & IT



$$\max_1 = 1^{st} = 80 = 90 = 100 = 150 = 200$$

$$\max_2 = 2^{nd} = 20 = 30 = 60 = 100 = 150 = 180$$

Sorted

2-ele

① LS $\rightarrow n^2$

② BS $\rightarrow n \log n$

③ $O(1)$

3 ele

n^3

$n^2 \log n$

$O(1)$

4 ele

n^4

$n^3 \log n$

$O(1)$

Unsorted

① LS $\Rightarrow n^2$

② BS \Rightarrow $\left. \begin{array}{l} 1. \text{ sort } \rightarrow n \log n \\ 2. \text{ BS } \rightarrow n \log n \end{array} \right\} \text{ after } \Rightarrow n \log n$

③ $\left. \begin{array}{l} 1. \text{ sort } \rightarrow n \log n \\ 2. \text{ return with 2-ele } \rightarrow O(1) \end{array} \right\} \text{ after } \Rightarrow n \log n$

④ 1. find-max

$\Rightarrow O(n)$

2. return (true)

$O(n)$

i/p: sorted array of n -distinct ele

o/p: find any 2-ele (a, b) , such that $a + b < 1000$

TC?

① LS — n^2 ② BS — $n \log n$ sorted

③ return (first 2-ele) — $O(1)$

① LS — n^2 ② BS — $\begin{matrix} 1. \text{ sort} \\ 2. \text{ BS} \end{matrix} \Rightarrow n \log n$ unsorted

③ 1. sort
2. return (1st 2 ele)

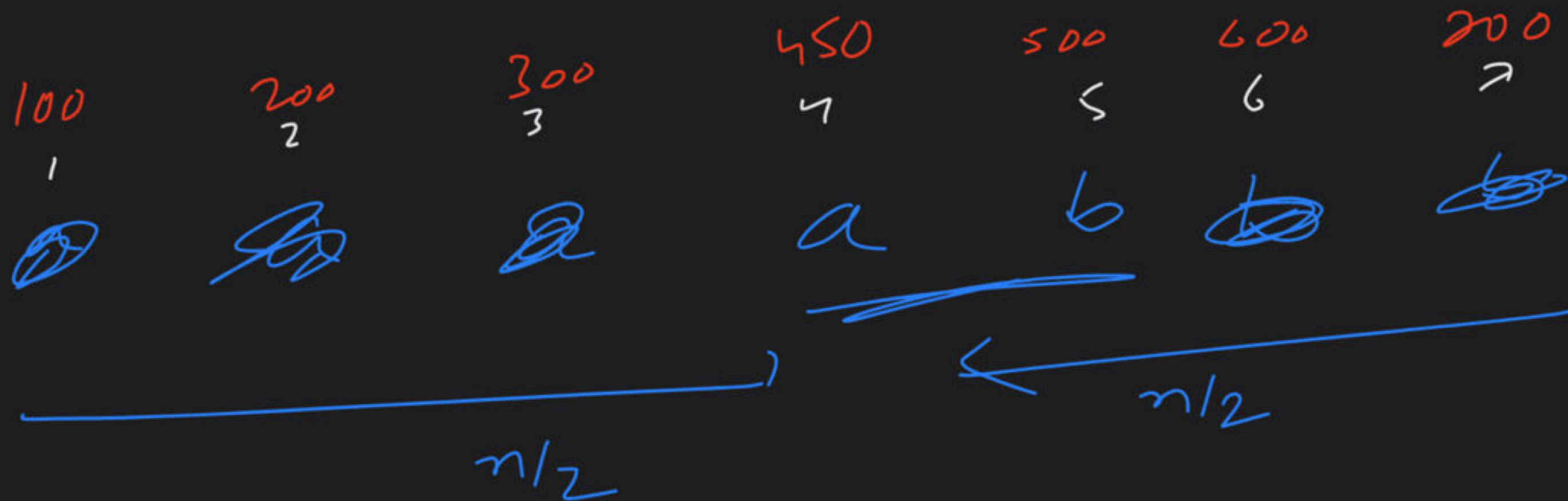
④ find 2-min
return (1st 2 ele) — ③ $\Rightarrow O(n)$

~~ex~~

i/p: sorted array of n -distinct ele

o/p: find any 2-ele (a, b) such that $a + b == 1000$

TC = ?



① $n \log n \Rightarrow n^2$

② $n \log n \Rightarrow n \log n$

③ ① $i = 1$ - position $j = \text{last} - \text{position}$

while ($i \neq j$)

if ($a[i] + a[j] == 1000$) return ($a[i], a[j]$)

else

if ($a[i] + a[j] > 1000$)

$j = j - 1$

else

$i = i + 1$

$O(n)$

Greedy Algo

Unsubscribed

1. LS $\Rightarrow n^2$

2. BS \Rightarrow 1. Sort
2. BS } 2 $\log n$

③ ① Sort - $n \log n$
② Greedy Algo - n
 $n \log n$

MergeSort

Note: merging 2-sorted Subarrays is known as MergeSort.

i/p: Array of n -ele

o/p: sorted array.



