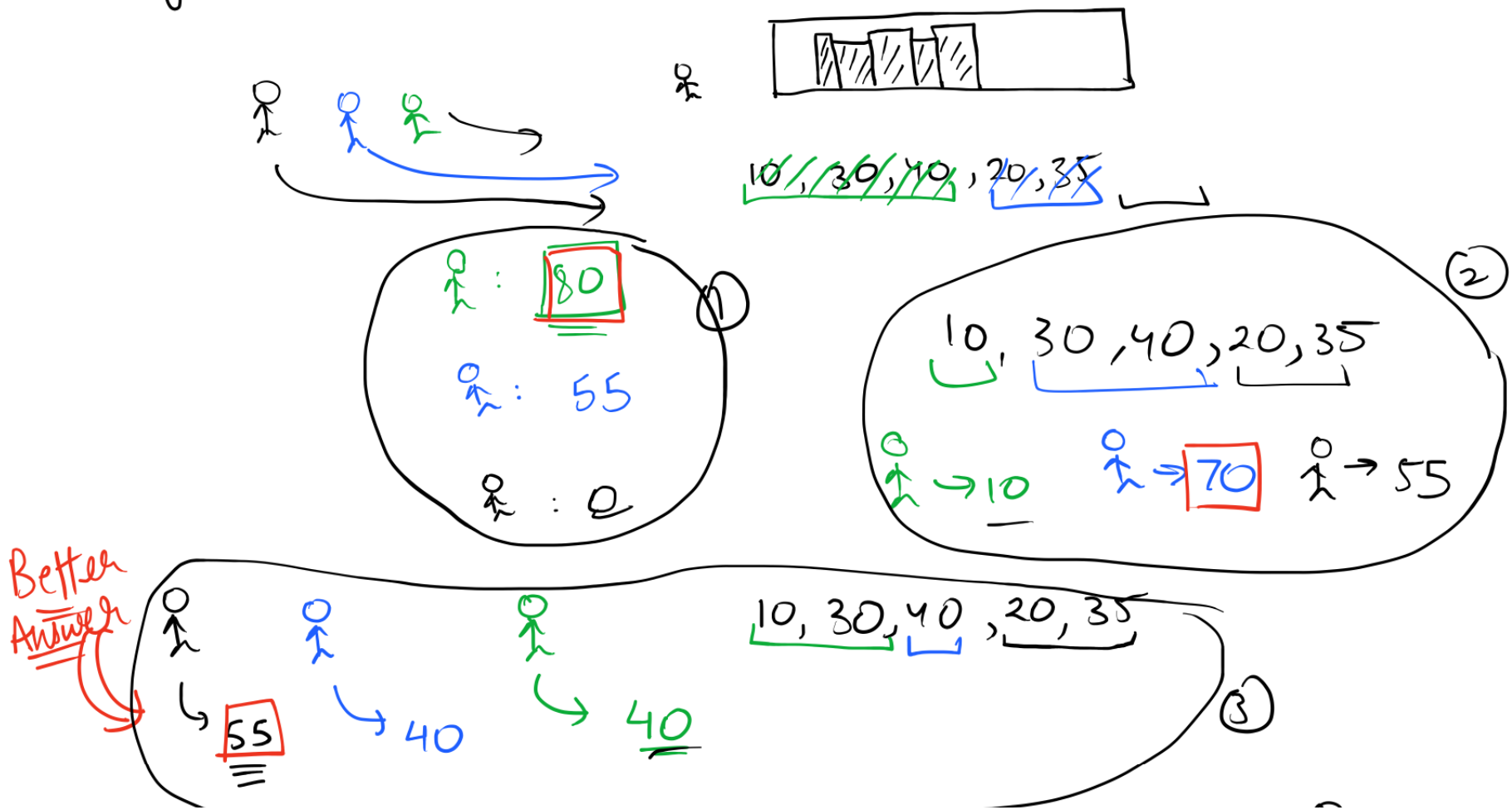
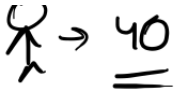
Thursday, 11 July 2024
8:47PM

Binary Search on Answers





80 , 70 , 55

↳ minimum

Assuming Maximum ==~~30~~ → 40

3

↳ How many student are required?

10, 30, 40, 20, 35

39 ×

10, 30, 40, 20, 35

↳ 4 students ×

How many students are required if a student could read 40 pages maximum

Max is → 45

How many students are rqd?

10, 30, 40, 20, 35

↳ 4 students

Maximum → ~~20~~ 80 ✓

10, 30, 40, 20, 35

2 → 3

Maximum → 135

10, 30, 40, 20, 35

Minimum value of maximum pages that can be read by a student??

↳ 40 X ⇒ 4 > 3

41 42 43 50

Maximum value of maximum pages that can be read by a student??

↳ 135

60 ✓ 58 ✓

→ Steps

↳ Choose maximum number of pages b/w 40 and 135

↳ Calculate how many students are 35

required ??

↳ check is it possible or not ?? → Reqd student

↳ If yes ✓

↳ save ans and search for better a

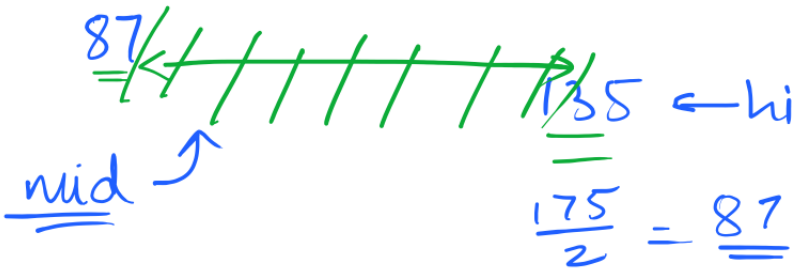
↳ sma

Not Possible

↳ Increase the no. of pages

lo → 40

↳ move to right

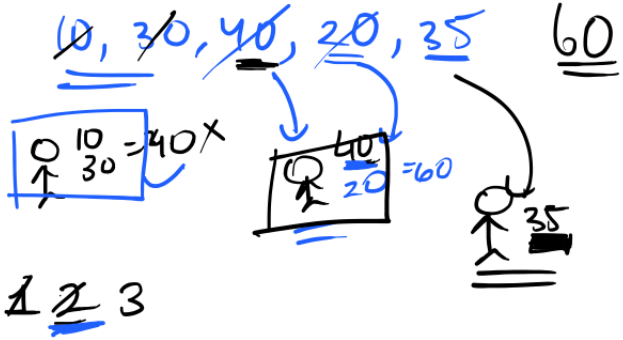


Time Complexity

$O(n \times \log m)$

n = no. of books

m = sum of pages

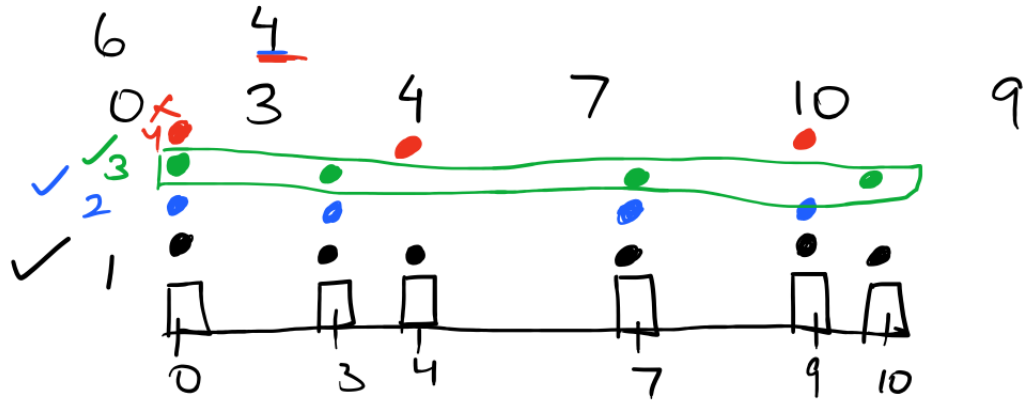


How to identify if we will be using B.S or Not?

↳ Maximize the Minimum ✓

↳ Minimize the Maximum ✓

Aggressive Cows



0 ✓ 1 10?? X

2 ✓ → 4 $\overset{=}{3} < 4$ X

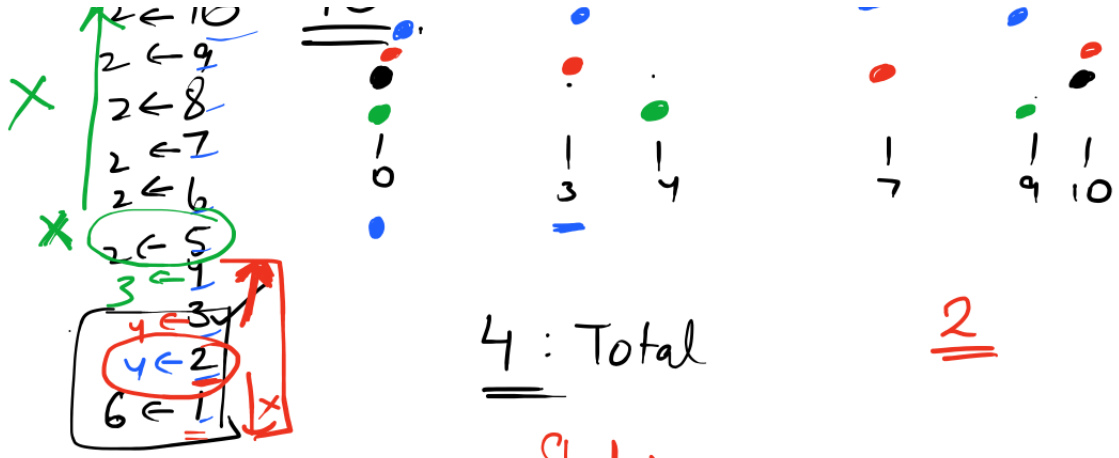
0, 3, 7, 4, 9, 10 (X)

↳ sorting is required

6 → 2 cows were placed

↳ distance

10



4 : Total 2

Steps

↳ Min Possible Distance → 1

↳ Max Possible Distance → sort(arr)

↳ arr[n-1] - arr[0]

← 1 cow in first and last idx.

↳ With the help of B.S

↳ Calculate the no. of cows that can be placed?

↳ Check if it is possible to place given no. of cows

Yes ← → No

↳ Store the ans and look for ans having more distance
↳ increase distance

↳ Decrease the distance to fit the total number of cows.

Can I place cows 5 distance away?

0, 3, 4, 7, 9, 10

0 + 5 <= 7

Time complexity

↳ B.S over maxDis - minDis

log(maxDis) × O(n)

↳ is Possible

$O(n.\log m) + O(n.\log n)$

where n = no. of elements

m = maximum distance