Binary Search Playlist

Video-33

Leetcode
-2563
Medium

Something Big Coming on 100K :)

Facebook
Instagram → codestorywithMIK

(Twitter) → CSwithMIK

codestorywithMIK →

Try this channel to see "Life behind the Scenes

Motivation :-

- Rejections don't define you.
  They actually REFINE you.
- Each time you don't get a job,
  or an interview goes bad,
  it's an opportunity to learn.
  - what went wrong ???
  - what can you do differently ???

Failure is not a barrier, it's
a stepping stone towards success.

2563. Count the Number of Fair Pairs

Medium | Topics | Companies | Hint

Given a **0-indexed** integer array `nums` of size `n` and two integers `lower` and `upper`, return *the number of fair pairs*.

A pair `(i, j)` is **fair** if:

- `0 <= i < j < n`, and
- `lower <= nums[i] + nums[j] <= upper`

Example :- nums = [0, 1, 7, 4, 4, 5]

lower = 3

upper = 6

3 <= <= 6

Output :- 6

Brute Force.

$O(n^2)$.

Thought Process

nums = {1, 4, 5, 1, 7, 4, 20}

lower = 8
upper = 13

lower <= PairSum <= upper

Mathematical.

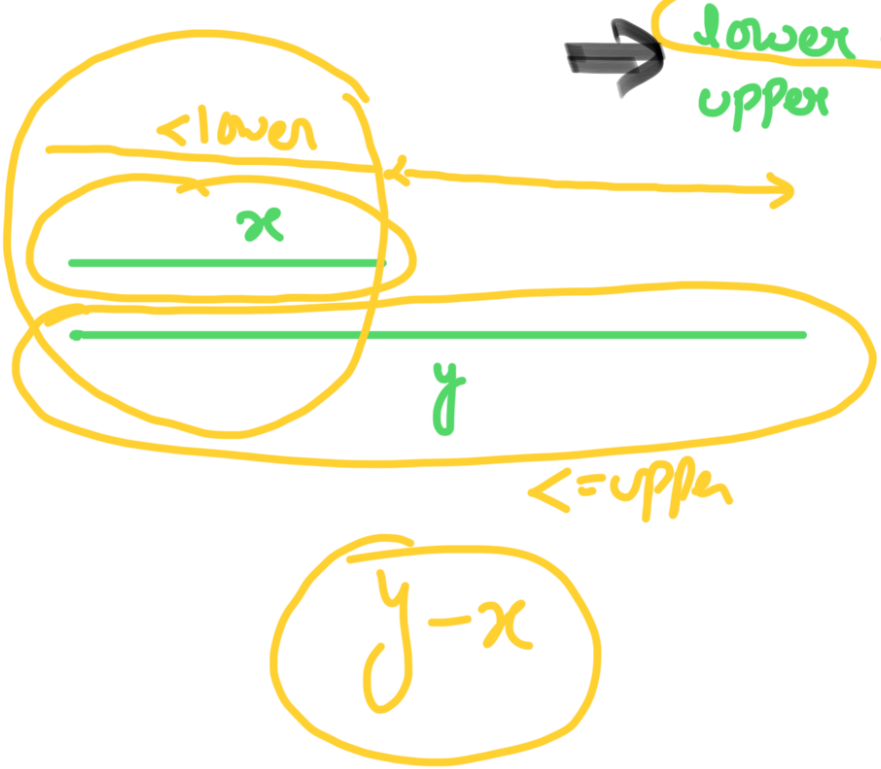
$(y - x)$

$x \rightarrow$ Sum < lower

Pairs

y → Sum <= upper

pairs



Find total pairs having sum < lower. x

Find total pairs having sum <= upper. y

nums = {1, 4, 5, 1, 7, 4, 20}

lower = 8
upper = 13

lower - nums[i] = 7

nums[i] = 1

upper = 13

8 <= ma

13-1 = 12

x = 4 pairs

y = 5 pairs

y - x =

(1,4) , (1,5) , (1,1) (1,4)

(1,4) (1,5) (1,1) [(1,7)] (1,4)

(1,5) = 1+5 = 6

(1,1) = 2

(1,7) = 1+7 = 8

nums = { 1, 4, 5, 1, 7, 4, 20 } (indices 0 1 2 3 4 5 6)

lower = 8

upper = 13

i → 1 (index 0)

7 (index 4)

8 − 1 = 7

lower - nums[i] → lower_bound( )

std:: lower_bound (7) = first element which is "NOT LESS" Than 7

↓

Sorted.

Sort.

nums = { 1, 1, 4, 4, 5, 7, 20 } (indices 0 1 2 3 4 5 6)

lower = 8

upper = 13

i → 1 (index 1)

x = 4

y = 5

val = (5 - 4) = 1

lower - nums[i] = 8 - 1 = 7

idx = lower_bound (i+1, n-1, 7); // 5

count = idx - i - 1; = 5 - 0 - 1 = 4

upper - nums[i]

13 - 1 = 12 upp.

i

0 1 2 3 4 5 6 7 8

{1, 1, 4, 4, 12, 12, 12, 12, 20}

upper_bound(i+1, n-1, upp-nums[i]) > -1;

7 - i = 7 - 0 = 7