Ques Find an element in 2D Sorted array

(17)

1	4	9	10	12
2	5	11	13	15
4	6	12	14	19
7	9	15	17	21
8	11	19	22	25

Brute Force → $O(n^2)$

curr < val ↓ i++

curr > val ← j--

$O(n)$

```
i = 0
j = arr[0].length
while(i < a.length && j >= 0) {

}
```

Ques

7 1 3 5 2 4 9

i j k p=4

Triplets

a[i] a[j] a[k]

$|a[i] - a[j]| \leq p$

Count no of triplets

3, 5, 4

$|3-5| = 2$

$|3-4| = 1$

$|5-4| = 1$

Brute Force

```
i = 0   < n-2
j = i+1 < n-1
k = j+1 < n
```

```
for(i
  for(j
    for(k
      { if
```

$O(n^3)$

Sort $(n \log n)$

-1 0 0 2 2 2 3 4 5 7 9

0 1 2 3 4 5 6 7 8 9 10

p = 4

- - 5

5

i = 8 ub = 5-4 = 1

ub i = 3

total = 8 - 3 = 5

total C_2

$nC_2 \Rightarrow \frac{n!}{(n-2)! \times 2!}$

$\frac{(n) \times (n-1) \times (n-2)!}{(n-2)! \times 2}$

$(n \times (n-1))/2$

Find index lb

(1)

ans = ~~2~~ ~~3~~ 3

-1	0	0	2	2	2	3	4	5	7	9
0	1	2	3	4	5	6	7	8	9	10

r l

m

Modulo Arithmatics

$10^9 + 7$

↳ largest prime number in the range of int

$a \,\%\, b = c \qquad 0 \le c < b$

mod → just to make your ans in range of int.

$b = 10^9$

int $a = b \times b$

$(a + b) \,\%\, m = ((a \,\%\, m) + (b \,\%\, m)) \,\%\, m$

$(a * b) \,\%\, m = ((a \,\%\, m) * (b \,\%\, m)) \,\%\, m$

```
int fact(int n) {
    int f = 1, m = 1000000007;
    for(i=1; i<=n; i++) {
        f=((f%m) * (i %m))%m;
    }
    return f;
```