Class 12

Wednesday, February 2, 2022 9:05 PM

arr (sorted)

↳ [L, R] ⟶ lower_bound / upper_bound

LB(5) = 3 > 5 [5,10] → 5

UB(10) = 8

Lower_bound

idx →	0	1	2	3	4	5	6	7	8
value →	1	3	3	6	7	8	10	10	15

[5,10]

LB(5) = 5 থেকে ছোট (1,3,3) = 3

lower_bound(3) = 1

upper_bound(3) = 3

UB(10) = 10 এর সমান বা ছোট (1,3,3,6,7,8,10,10) = 8

UB(10) − LB(5) = 8 − 3 = 5

UB(R) − LB(L)

UB(x) = LB(x+1)

0	1	2	3	4	5	6	7	8	9
1	3	3	6	7	8	10	10	15	X

L, R, M

LB(10)

L = M+1

R = M

< = >

while(L<R)

{ M = (L+R)/2

if (arr[M] < v)

L = M+1

else

R = M

}

return 2;

$O(T Q \log(N))$

$T = 5$

$Q = 5 \times 10^4$

$N = 10^5$

$5 \times 5 \times 10^4 \times 17 \rightarrow 5 \times 10^6$

(20)

$$\frac{5 \times 10^6}{10^8} = 5 \times 10^{-2}$$

$$= 0.05 s$$