

Binary Search in Matrices

Search in Matrices

		c	c	c
		0	1	2
r	0	18	9	12
r	1	36	-4	91
r	2	44	33	16

target = 91

```
for r=0; r<n; r++:
    for c=0; c<n; c++:
        if arr[r][c] == tar?
            Return ans
```

Ans [1, 2]

return -1;

$O(N^2)$

If N Rows and M column $O(N * M)$

Q → Matrices is sorted in a row wise and column wise manner.

		0	1	2	3	
LB		0	1	2	3	UB
0	10	20	30	40		
1	15	25	35	45		
2	28	29	37	49		
3	33	34	38	50		

target = 37

Case 1 → If element == target
 ⇒ ans found

$n + n = 2n$

Case 2 → If element < target
 r++

$O(n)$

Case 3 → If element > target
 c--

($r < \text{matrix.length}$
 & $c > 0$)