

# Sliding Window Maximum

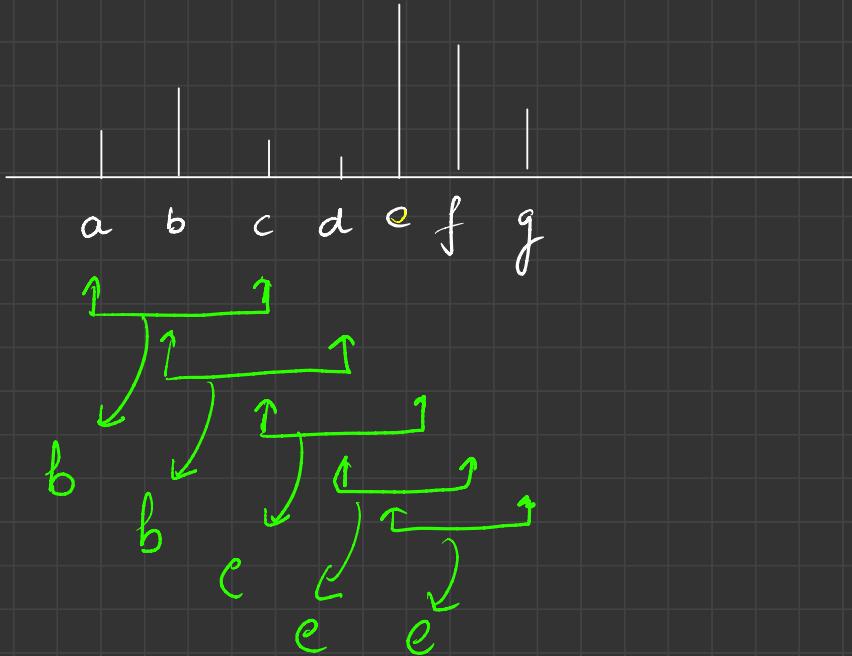
$$\text{arr}[7] = \{1, 3, -1, -3, 5, 3, 6, 7\} \quad K=3.$$

Brute force

$T.C: \underline{\underline{O(N*K)}}$

$$\frac{N \times (K-1)}{\downarrow}$$

Steps!



$\text{arr}[] = \{ 0, 1, 2, 3, 4, 5, 6, 7 \}$

$\text{ngers}[] = \{ 1, 4, 4, 4, 6, 6, 7, 8 \}$

Wd der T C(N \* K)

Starting index of each window

i

j

\*

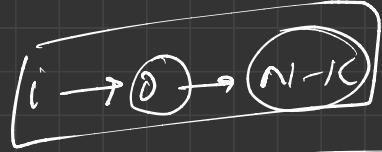
$j = \text{ngers}[j]$

$\{ 3, 3, 5, 5, 6, 7 \}$

$$\{0, 1, 2, 3, 4, 5, 6, 7\} \xrightarrow{y} 7 - 3 = 4$$

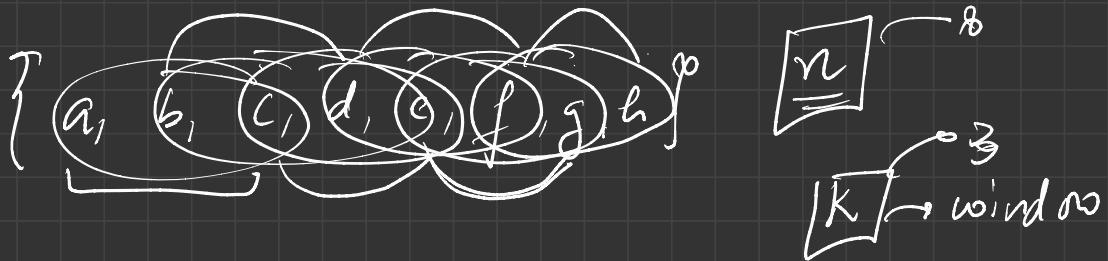
$\uparrow$

$\uparrow$



$$[N - K]$$

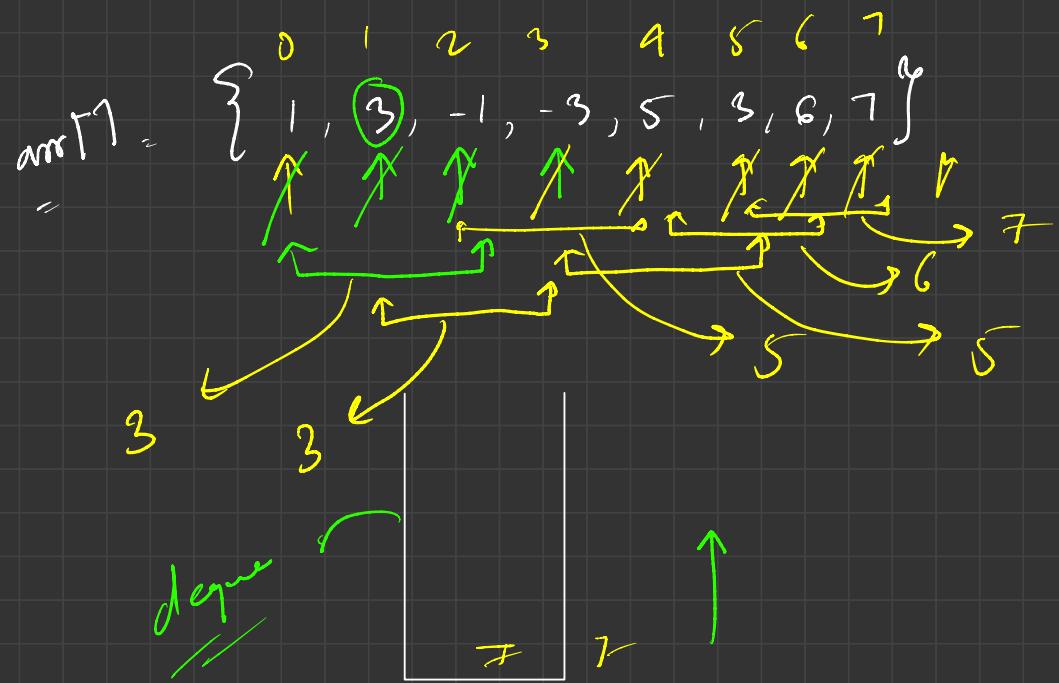
$$N \times (K-1) = [N \times K]$$



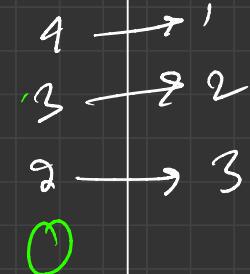
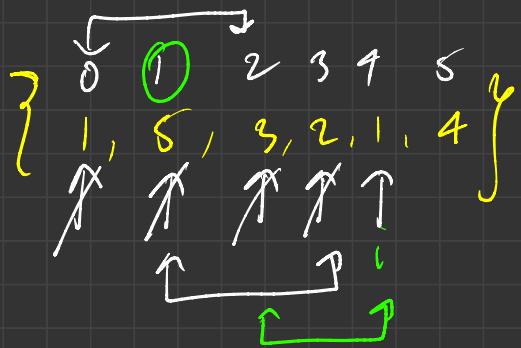
How many  
=

$$[8 - 3 + 1]$$

$$[n - k + 1] \rightarrow [ \text{windows} ]$$



~~nger:~~



5, 5

K  
people  
at mark

Stack  
==

```

static int[] SlidingWindowMaximum(int N, int K, int[] arr) {
    // write code here
    int[] ans = new int[N - K + 1];
    int window_Num = 0;

    // for stack -> addLast, removeLast
    Deque<Integer> dq = new ArrayDeque<>();

    for (int i = 0; i < N; i++) {
        while (dq.size() > 0 && dq.peek() <= i - K) {
            dq.removeFirst();
        }

        int ele = arr[i];
        while (dq.size() > 0 && ele > arr[dq.getLast()]) {
            dq.removeLast();
        }

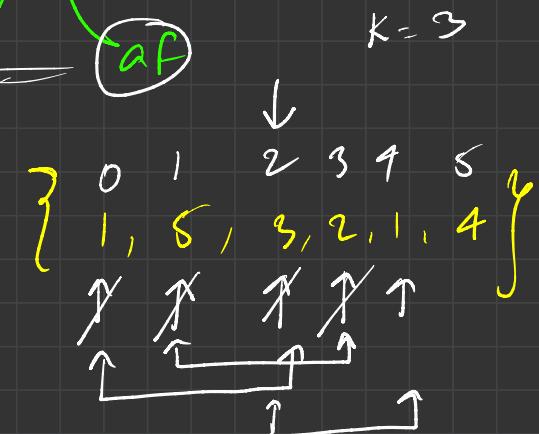
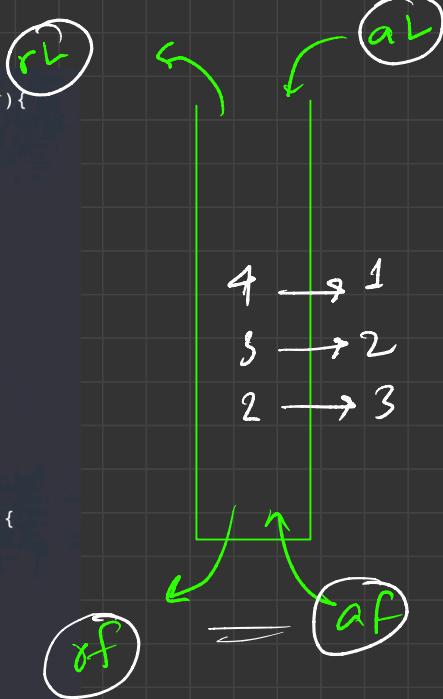
        dq.addLast(i);
    }

    if (i >= K - 1) {
        ans[window_Num] = arr[dq.peek()];
        window_Num++;
    }

    return ans;
}

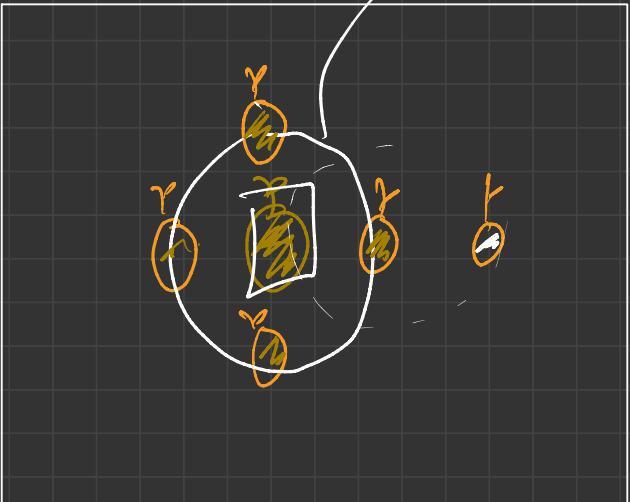
```

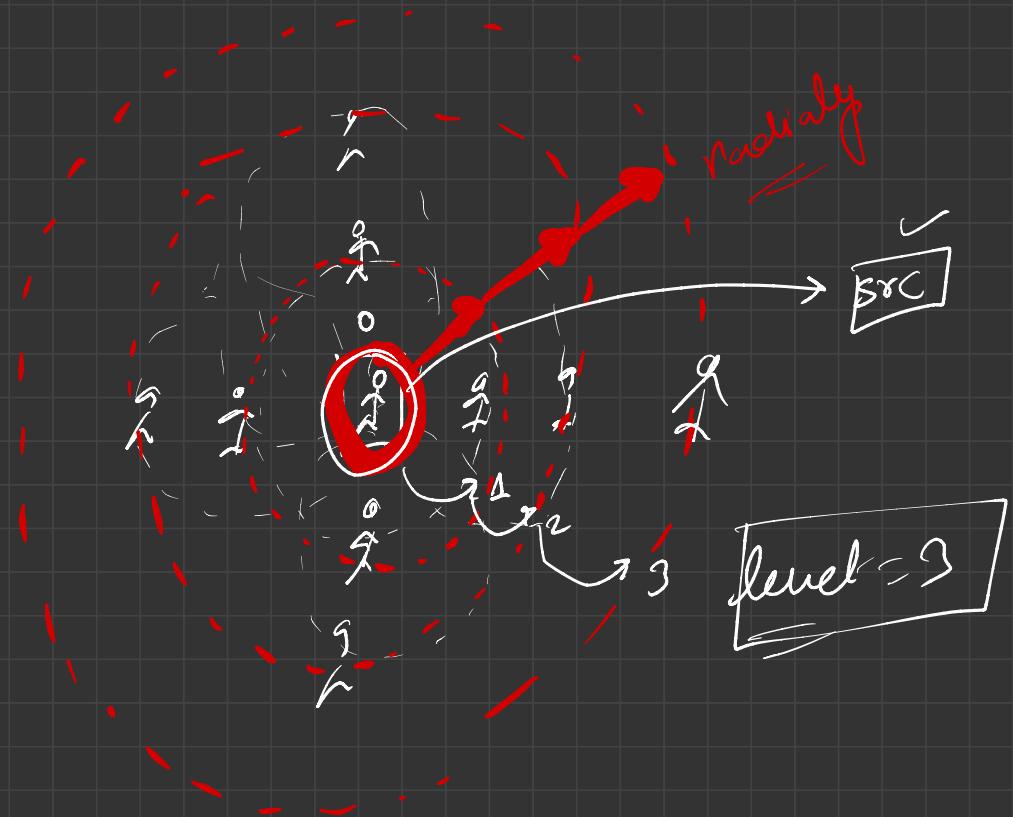
5, 5, 3



Rotten Oranges

→ rotten in time





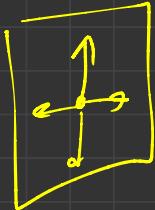
~~dfs~~

depth first search

bfs

\* \* \*  
Shortest  
distance

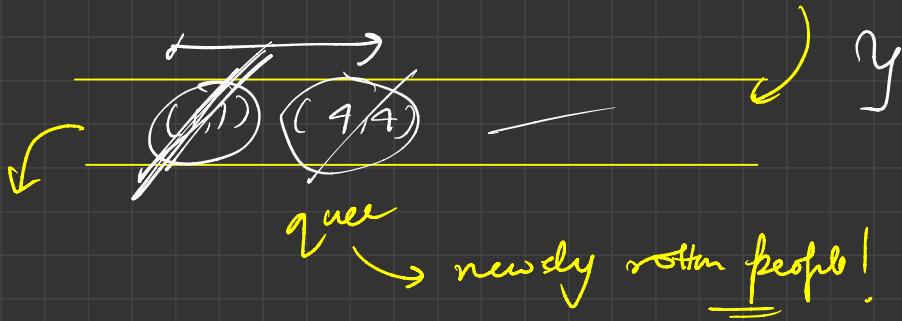
Breadth first  
Search

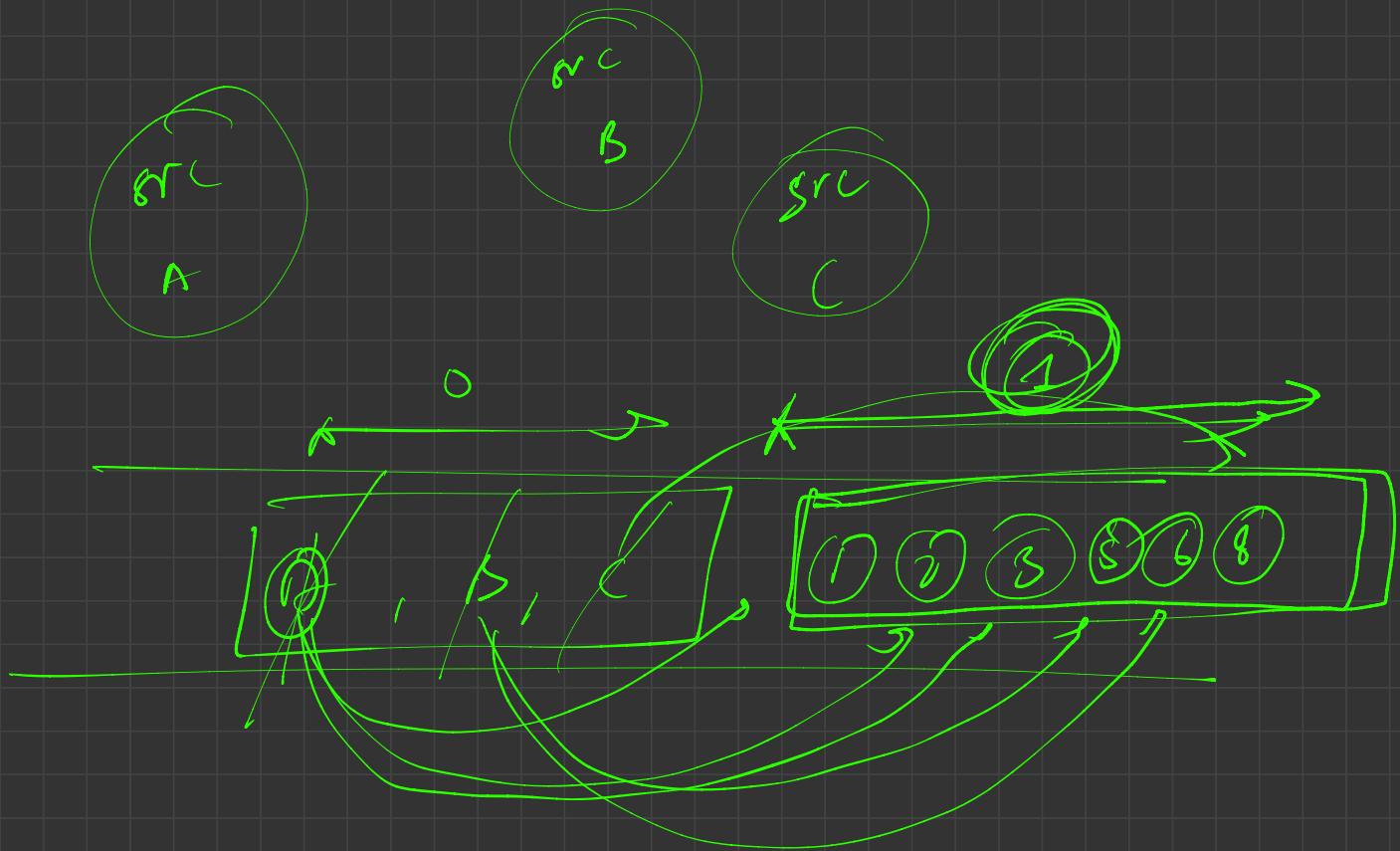


	0	1	2	3	4
0	1	0	0	0	1
1	0	1	1	0	0
2	0	0	1	1	0
3	0	1	2	0	0
4	0	0	1	1	1

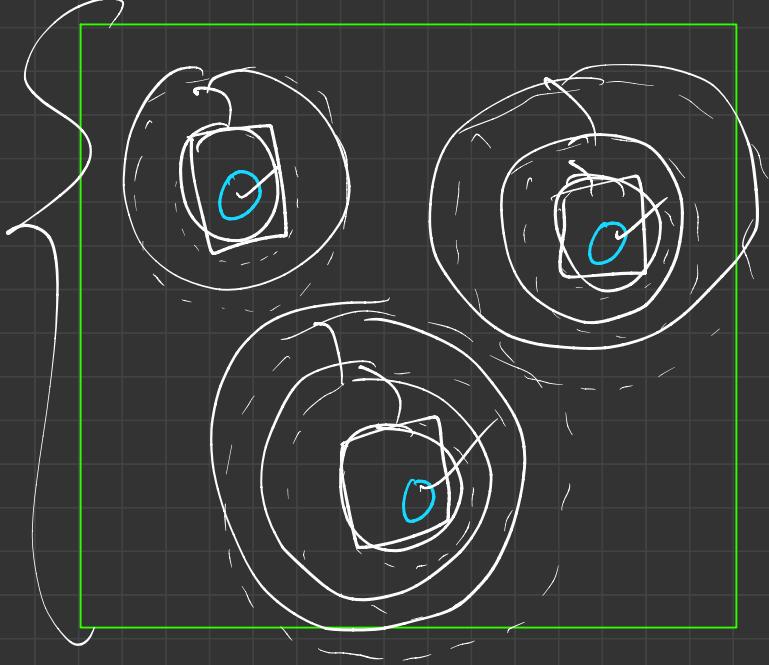
$1 \rightarrow$  fresh  
 $2 \rightarrow$  rotten  
 $0 \rightarrow$  empty

level ~~4~~



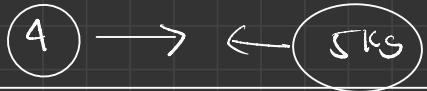


day 180



## Asteroid Collision

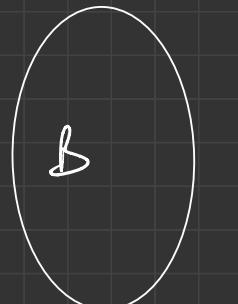
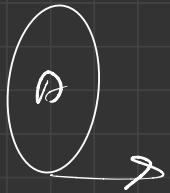
universe  
momentum  
+ relative velocity  
+ acc



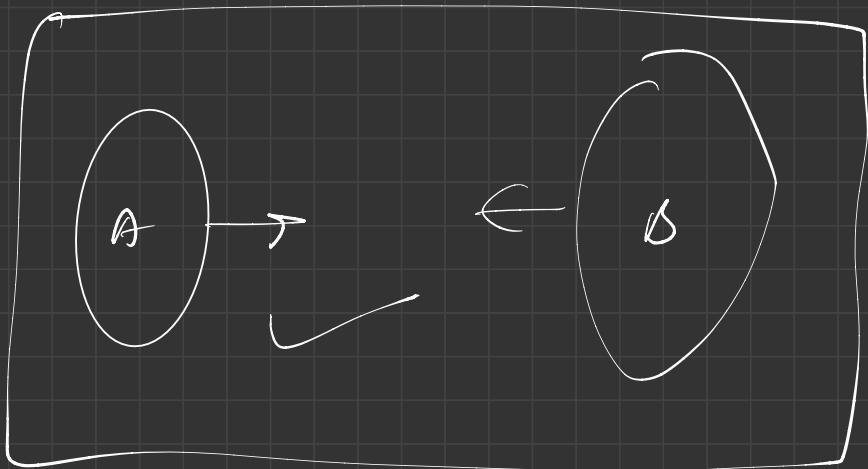
when collision

- ① Smaller one gets destroyed, bigger ones unaffected.
- ② Two of same size collide, both get destroyed.





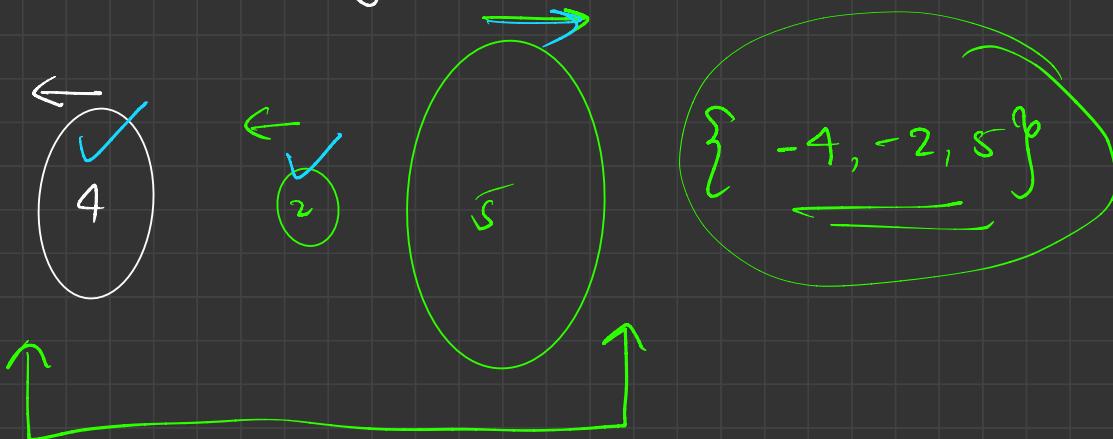
X

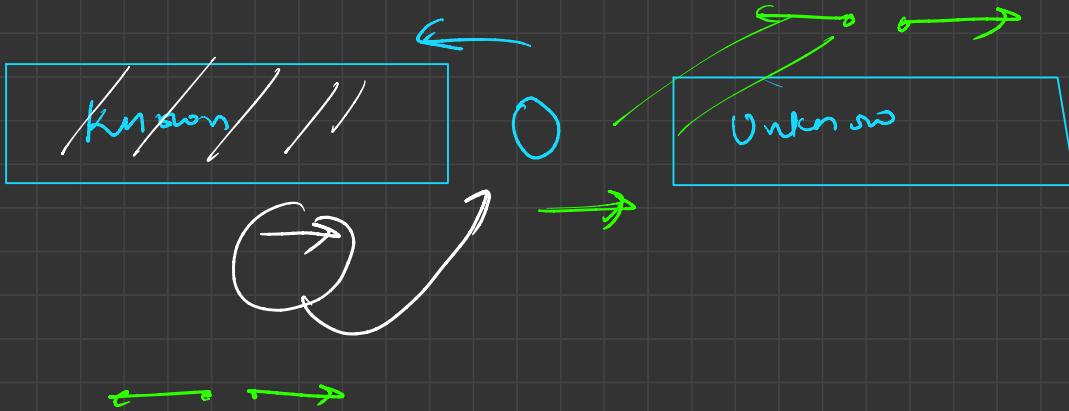


astroids  $\Gamma$ :  $\left\{ \begin{array}{c} 1, 2, 3, -4, -2, 5, -3 \\ \cancel{1} \cancel{2} \cancel{3} \cancel{-4} \cancel{-2} \cancel{5} \cancel{-3} \end{array} \right\}^y$

(+)ve  $\rightarrow$  moving towards right  $\nearrow$

(-)ve  $\rightarrow$  moving towards left  $\searrow$

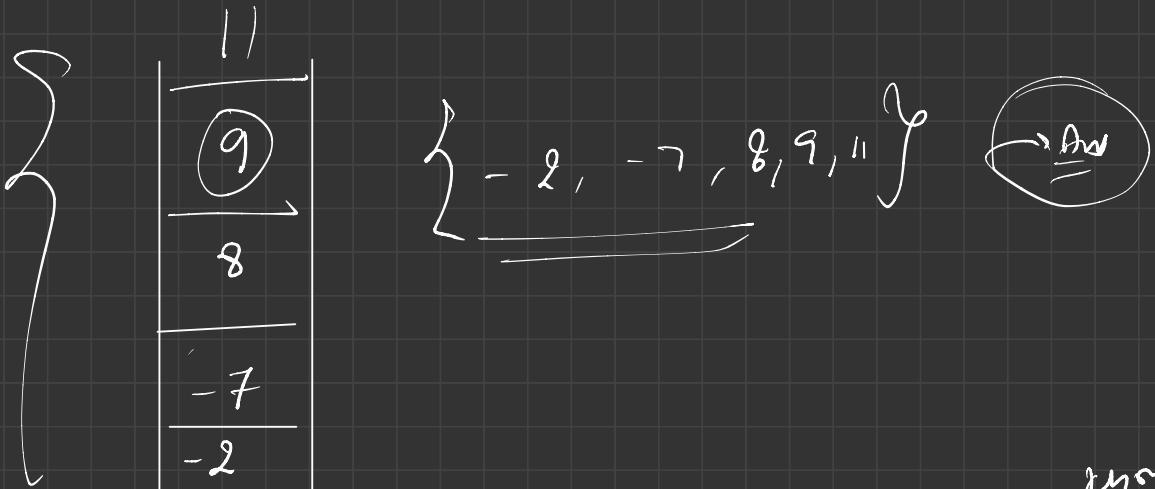




a asteroid moving towards, <sup>left</sup> can be affected by known

a asteroid moving towards tip, can be affected by  
unknown univers

asteroids  $\{ \}$  =  $\{-2, 3, 4, -4, 5, -7, 8, 9, -3, -2, 11\}$



→ Asteroids who are moving freely in universe

