Agenda

1. Sliding window maximum
2. Asteroid collision
3. Rotten Oranges

Sliding window maximum.

$$\begin{array}{ccccccccc} & 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \text{int[] arr} = \{ & 1, & 3, & -1, & -3, & 5, & 3, & 8, & 12 \} \end{array}$$

int K = 3

maxWin[] = {3, 3, 5, 5, 8, 12} → ans

Brute force.

```
for (int i = 0 ; i <= n-K ; i++)
{
    int max = -∞;
    for (int j = i ; j < i+K ; j++)
    {
        max = max(max, arr[j]);
    }
}
```

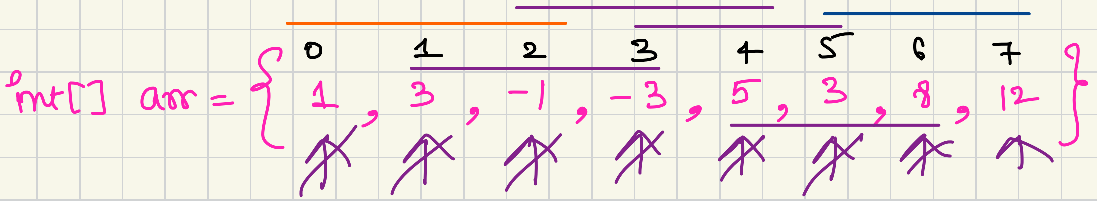
TC: $O(N*K)$

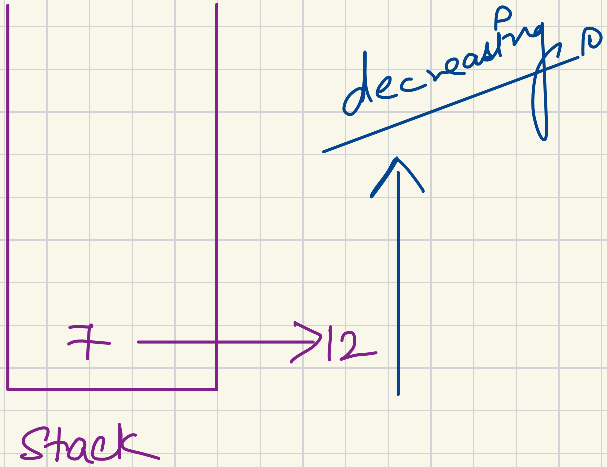
SC: $O(1)$

int[] arr = { 1 , 3 , -1 , -3 , 5 , 3 , 8 , 12 }

int K = 3

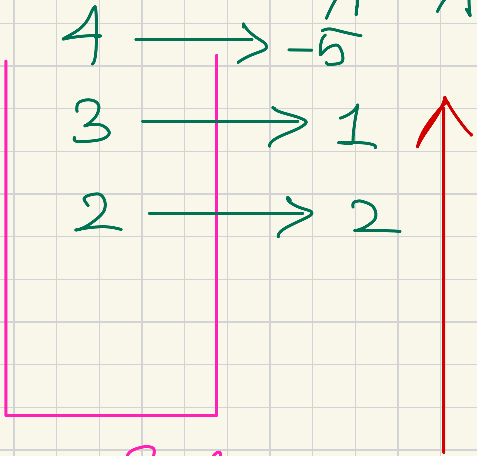
{3 , 3 , 5 , 5 , 8 , 12 }





$$\begin{array}{lccccc} & 0 & 1 & 2 & 3 & \boxed{4} \\ \text{int[] arr} = \{ & 4, & 3, & 2, & 1, & -5 \ \} \end{array}$$

$k = 3$



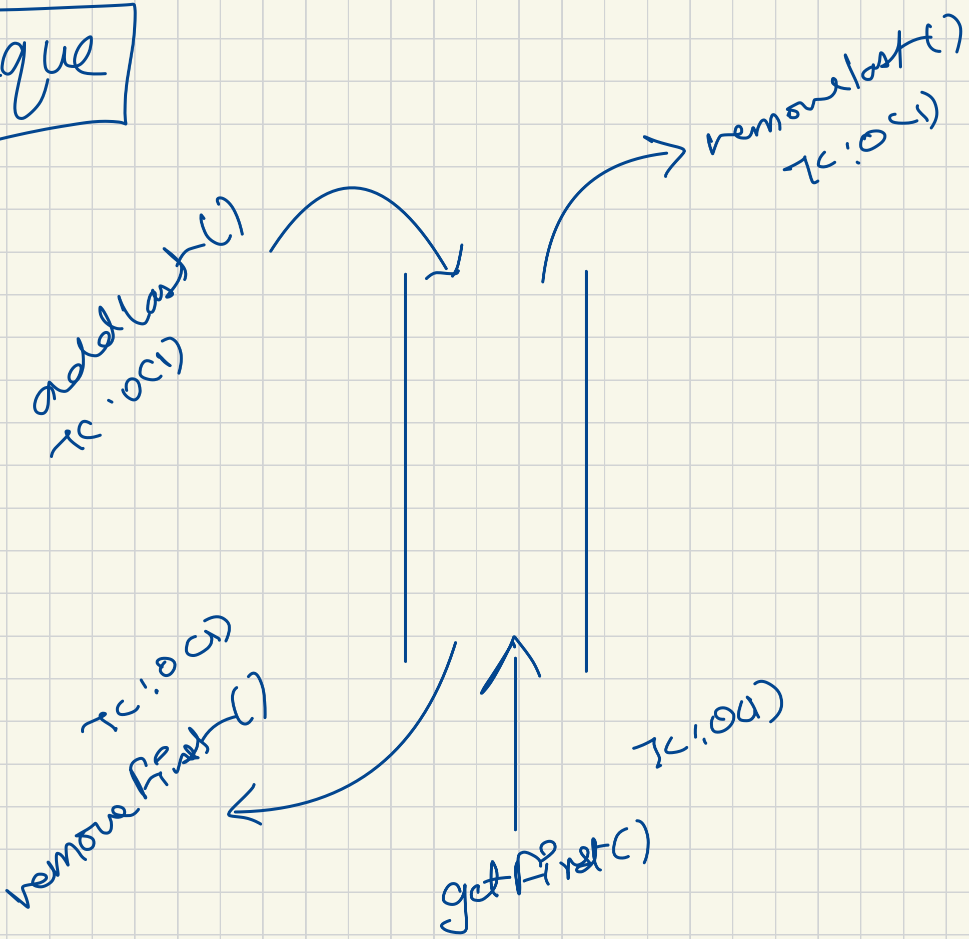
nger{st}

~~biggest to smallest~~

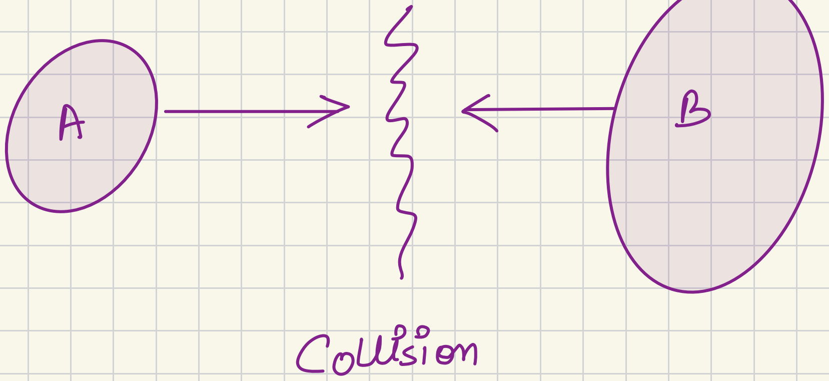
decreasing Order!

window 1 : 4
window 2 : 3
window 3 : 2

deque


addLast()
TC : O(1)
removeLast()
TC : O(1)
removeFirst()
TC : O(1)
getFirst()
TC : O(1)

Asteroid Collision.



NOTE : Smaller one will get destroyed and bigger one will be unaffected

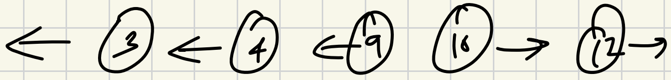
NOTE ! two asteroids of same size collide , both will get destroyed.

asteroids[] = {-3, -4, 5, 3, -3, -4, 6, -9, 10, 12, 9, 6, -10}

(+)ve : moving right

(-)ve : moving left

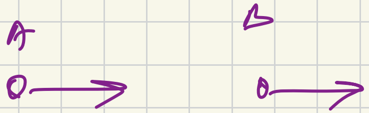
o/p



↳ Stable universe

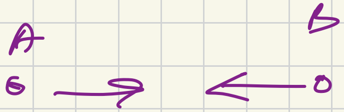
✓ {-3, -4, -9, 10, 12}

Case1



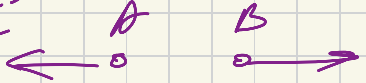
No

Case2



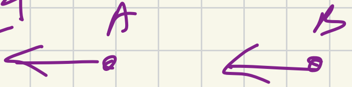
Yes

Case3



No

Case4

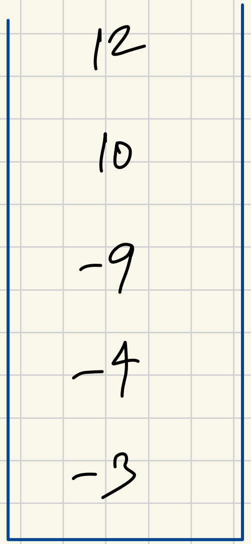


No

asteroids[] = {-3, -4, 5, 3, -3, -4, 6, -9, 10, 12, 9, 6, -10}

↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑

No collision ✓



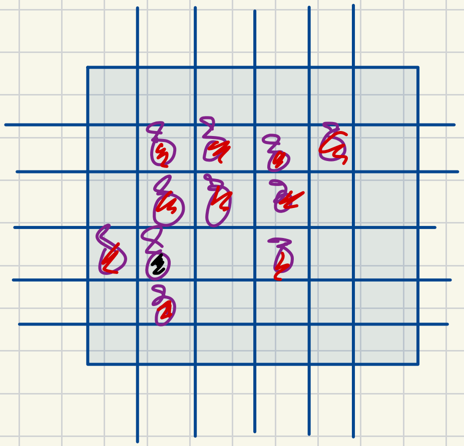
asteroid {known universe}

{-3, -4, -9, 10, 12} o/p

$\boxed{\text{TC: } O(N) \quad \text{SC: } O(N)}$ ✓

Rotten Oranges

$\boxed{\text{4BFS}}$



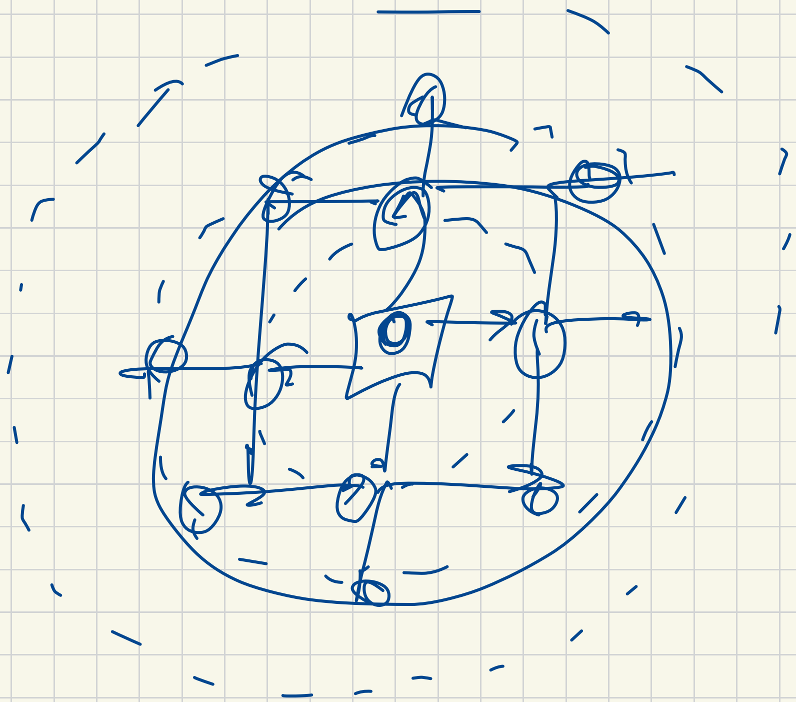
~~1 unit~~

~~2 unit~~

~~3 unit~~

~~4 unit~~

5 unit



$$\begin{array}{c|ccccc}
 & 0 & 1 & 2 & 3 & 4 \\
\hline
0 & 0 & 1 & 1 & 0 & 0 \\
1 & 0 & 1 & \cancel{2} & 0 & 0 \\
2 & 0 & 0 & 2 & 0 & 0 \\
3 & 0 & 0 & 0 & 0 & 1 \\
4 & 0 & 1 & \cancel{1} & 2 & \cancel{1} \\
5 & 0 & 1 & 1 & \cancel{1} & 1
\end{array}$$

4 $\cancel{(2,2)}$ $\cancel{(4,3)}$ $\cancel{(1,2)}$ (4,2) (4,4) (5,4)