Problem 1801: Number of Orders in the Backlog

Problem Information

Difficulty: Medium
Acceptance Rate: 0.00%
Paid Only: No

Problem Description

You are given a 2D integer array

orders

, where each

orders[i] = [price

i

, amount

i

, orderType

i

]

denotes that

amount

i

orders have been placed of type

orderType

i

at the price

price

i

. The

orderType

i

is:

0

if it is a batch of

buy

orders, or

1

if it is a batch of

sell

orders.

Note that

orders[i]

represents a batch of

amount

i

independent orders with the same price and order type. All orders represented by

orders[i]

will be placed before all orders represented by

orders[i+1]

for all valid

i

.

There is a

backlog

that consists of orders that have not been executed. The backlog is initially empty. When an order is placed, the following happens:

If the order is a

buy

order, you look at the

sell

order with the

smallest

price in the backlog. If that

sell

order's price is

smaller than or equal to

the current

buy

order's price, they will match and be executed, and that

sell

order will be removed from the backlog. Else, the

buy

order is added to the backlog.

Vice versa, if the order is a

sell

order, you look at the

buy

order with the

largest

price in the backlog. If that

buy

order's price is

larger than or equal to

the current

sell

order's price, they will match and be executed, and that

buy

order will be removed from the backlog. Else, the

sell

order is added to the backlog.

Return

the total

amount

of orders in the backlog after placing all the orders from the input

. Since this number can be large, return it

modulo

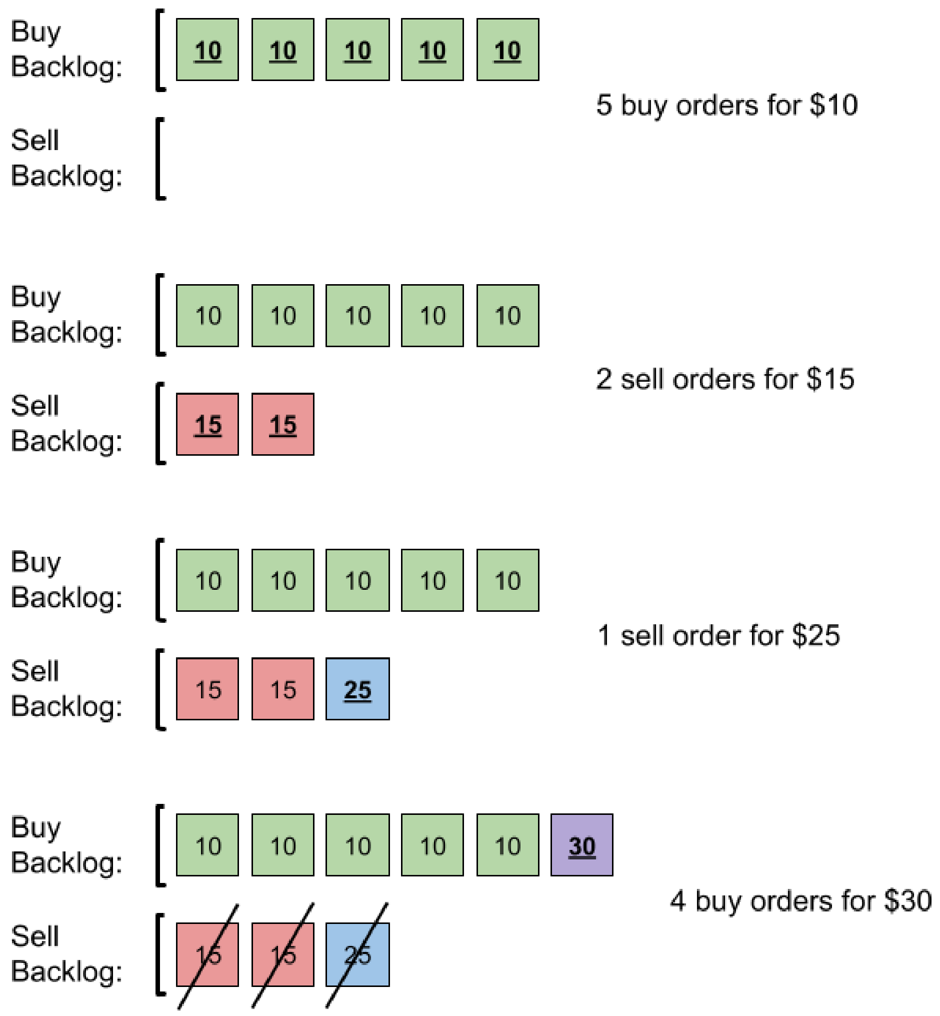
10

9

+ 7

.

Example 1:



Input:

orders = [[10,5,0],[15,2,1],[25,1,1],[30,4,0]]

Output:

6

Explanation:

Here is what happens with the orders: - 5 orders of type buy with price 10 are placed. There are no sell orders, so the 5 orders are added to the backlog. - 2 orders of type sell with price 15 are placed. There are no buy orders with prices larger than or equal to 15, so the 2 orders are added to the backlog. - 1 order of type sell with price 25 is placed. There are no buy orders with prices larger than or equal to 25 in the backlog, so this order is added to the backlog. - 4 orders of type buy with price 30 are placed. The first 2 orders are matched with the 2 sell orders of the least price, which is 15 and these 2 sell orders are removed from the backlog. The 3

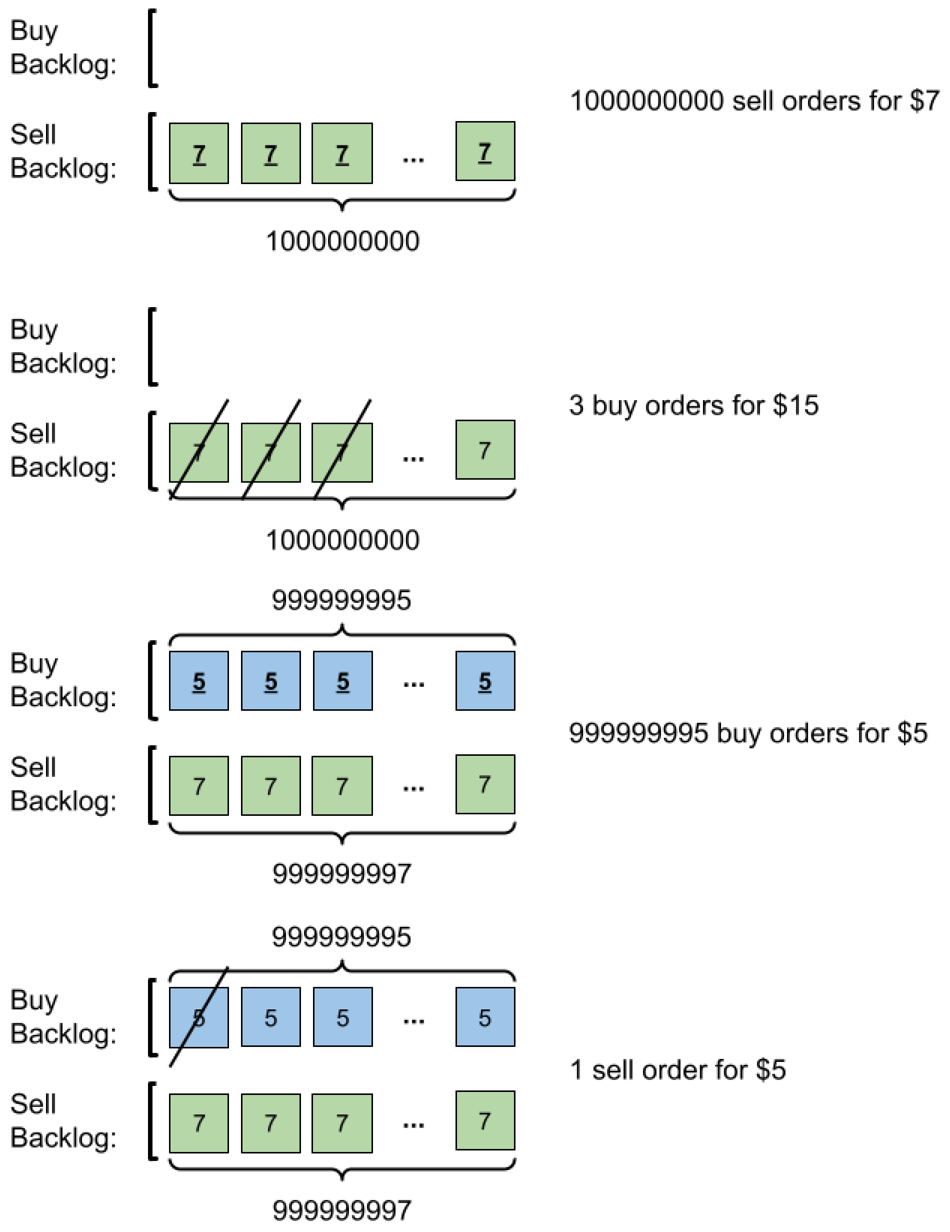
rd

order is matched with the sell order of the least price, which is 25 and this sell order is removed from the backlog. Then, there are no more sell orders in the backlog, so the 4

th

order is added to the backlog. Finally, the backlog has 5 buy orders with price 10, and 1 buy order with price 30. So the total number of orders in the backlog is 6.

Example 2:



Input:

orders = [[7,1000000000,1],[15,3,0],[5,999999995,0],[5,1,1]]

Output:

999999984

Explanation:

Here is what happens with the orders: - 10

9

orders of type sell with price 7 are placed. There are no buy orders, so the 10

9

orders are added to the backlog. - 3 orders of type buy with price 15 are placed. They are matched with the 3 sell orders with the least price which is 7, and those 3 sell orders are removed from the backlog. - 999999995 orders of type buy with price 5 are placed. The least price of a sell order is 7, so the 999999995 orders are added to the backlog. - 1 order of type sell with price 5 is placed. It is matched with the buy order of the highest price, which is 5, and that buy order is removed from the backlog. Finally, the backlog has (1000000000-3) sell orders with price 7, and (999999995-1) buy orders with price 5. So the total number of orders = 1999999991, which is equal to 999999984 % (10

9

+ 7).

Constraints:

1 <= orders.length <= 10

5

orders[i].length == 3

1 <= price

i

, amount

i

<= 10

9

orderType

i

is either

0

or

1

.

Code Snippets

C++:

```
class Solution {
public:
int getNumberOfBacklogOrders(vector<vector<int>>& orders) {

}
};
```

Java:

```
class Solution {
public int getNumberOfBacklogOrders(int[][] orders) {

}
}
```

Python3:

```
class Solution:
def getNumberOfBacklogOrders(self, orders: List[List[int]]) -> int:
```

Python:

```
class Solution(object):
def getNumberOfBacklogOrders(self, orders):
"""
:type orders: List[List[int]]
:rtype: int
"""
```

JavaScript:

```
/**
* @param {number[][]} orders
* @return {number}
*/
var getNumberOfBacklogOrders = function(orders) {

};
```

TypeScript:

```
function getNumberOfBacklogOrders(orders: number[][]): number {

};
```

C#:

```
public class Solution {
public int GetNumberOfBacklogOrders(int[][] orders) {

}
}
```

C:

```



int getNumberOfBacklogOrders(int** orders, int ordersSize, int*
ordersColSize){

}
```

Go:

```
func getNumberOfBacklogOrders(orders [][]int) int {

}
```

Kotlin:

```
class Solution {
fun getNumberOfBacklogOrders(orders: Array<IntArray>): Int {

}
}
```

Swift:

```
class Solution {
func getNumberOfBacklogOrders(_ orders: [[Int]]) -> Int {

}
}
```

Rust:

```
impl Solution {
pub fn get_number_of_backlog_orders(orders: Vec<Vec<i32>>) -> i32 {

}
}
```

Ruby:

```
# @param {Integer[][]} orders
# @return {Integer}
def get_number_of_backlog_orders(orders)

end
```

PHP:

```
class Solution {

/**
* @param Integer[][] $orders
* @return Integer
*/
function getNumberOfBacklogOrders($orders) {

}
}
```

Scala:

```
object Solution {
def getNumberOfBacklogOrders(orders: Array[Array[Int]]): Int = {

}
}
```

Racket:

```
(define/contract (get-number-of-backlog-orders orders)
(-> (listof (listof exact-integer?)) exact-integer?)

)
```

Solutions

C++ Solution:

```
/*
* Problem: Number of Orders in the Backlog
* Difficulty: Medium
* Tags: array, queue, heap
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

class Solution {
public:
int getNumberOfBacklogOrders(vector<vector<int>>& orders) {

}
};
```

Java Solution:

```
/**
* Problem: Number of Orders in the Backlog
* Difficulty: Medium
* Tags: array, queue, heap
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

class Solution {
public int getNumberOfBacklogOrders(int[][] orders) {

}
}
```

Python3 Solution:

```
"""
Problem: Number of Orders in the Backlog
Difficulty: Medium
Tags: array, queue, heap

Approach: Use two pointers or sliding window technique
Time Complexity: O(n) or O(n log n)
Space Complexity: O(1) to O(n) depending on approach
"""

class Solution:
def getNumberOfBacklogOrders(self, orders: List[List[int]]) -> int:
# TODO: Implement optimized solution
pass
```

Python Solution:

```
class Solution(object):
def getNumberOfBacklogOrders(self, orders):
```

```
"""
:type orders: List[List[int]]
:rtype: int
"""
```

JavaScript Solution:

```
/**
* Problem: Number of Orders in the Backlog
* Difficulty: Medium
* Tags: array, queue, heap
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

/**
* @param {number[][]} orders
* @return {number}
*/
var getNumberOfBacklogOrders = function(orders) {

};
```

TypeScript Solution:

```
/**
* Problem: Number of Orders in the Backlog
* Difficulty: Medium
* Tags: array, queue, heap
*
* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(1) to O(n) depending on approach
*/

function getNumberOfBacklogOrders(orders: number[][]): number {

};
```

C# Solution:

```
/*
* Problem: Number of Orders in the Backlog
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* Tags: array, queue, heap
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* Time Complexity: O(n) or O(n log n)
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*/

public class Solution {
public int GetNumberOfBacklogOrders(int[][] orders) {

}
}
```

C Solution:

```
/*
* Problem: Number of Orders in the Backlog
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* Tags: array, queue, heap
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* Approach: Use two pointers or sliding window technique
* Time Complexity: O(n) or O(n log n)
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*/



int getNumberOfBacklogOrders(int** orders, int ordersSize, int*
ordersColSize){

}
```

Go Solution:

```
// Problem: Number of Orders in the Backlog
// Difficulty: Medium
// Tags: array, queue, heap
//
```

```
// Approach: Use two pointers or sliding window technique
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(1) to O(n) depending on approach

func getNumberOfBacklogOrders(orders [][]int) int {

}
```

Kotlin Solution:

```
class Solution {
fun getNumberOfBacklogOrders(orders: Array<IntArray>): Int {

}
}
```

Swift Solution:

```
class Solution {
func getNumberOfBacklogOrders(_ orders: [[Int]]) -> Int {

}
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Rust Solution:

```
// Problem: Number of Orders in the Backlog
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impl Solution {
pub fn get_number_of_backlog_orders(orders: Vec<Vec<i32>>) -> i32 {

}
}
```

Ruby Solution:

```
# @param {Integer[][]} orders
# @return {Integer}
def get_number_of_backlog_orders(orders)

end
```

PHP Solution:

```
class Solution {

/**
* @param Integer[][] $orders
* @return Integer
*/
function getNumberOfBacklogOrders($orders) {

}
}
```

Scala Solution:

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object Solution {
def getNumberOfBacklogOrders(orders: Array[Array[Int]]): Int = {

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