

Problem 2158: Amount of New Area Painted Each Day

Problem Information

Difficulty: Hard

Acceptance Rate: 55.50%

Paid Only: Yes

Tags: Array, Segment Tree, Ordered Set

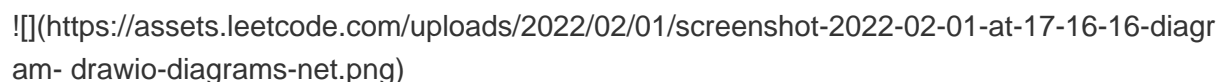
Problem Description

There is a long and thin painting that can be represented by a number line. You are given a **0-indexed** 2D integer array `paint` of length `n`, where `paint[i] = [starti, endi]`. This means that on the `i`th day you need to paint the area **between** `starti` and `endi`.

Painting the same area multiple times will create an uneven painting so you only want to paint each area of the painting at most **once**.

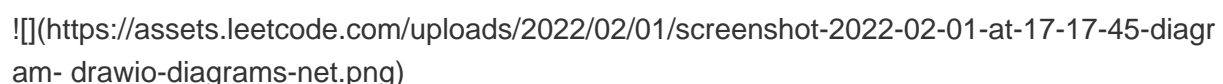
Return **an integer array** `worklog` of length `n`, where `worklog[i]` is the amount of **new** area that you painted on the `i`th day.

Example 1:

 <https://assets.leetcode.com/uploads/2022/02/01/screenshot-2022-02-01-at-17-16-16-diagram-drawio-diagrams-net.png>

Input: `paint = [[1,4],[4,7],[5,8]]` **Output:** `[3,3,1]` **Explanation:** On day 0, paint everything between 1 and 4. The amount of new area painted on day 0 is $4 - 1 = 3$. On day 1, paint everything between 4 and 7. The amount of new area painted on day 1 is $7 - 4 = 3$. On day 2, paint everything between 7 and 8. Everything between 5 and 7 was already painted on day 1. The amount of new area painted on day 2 is $8 - 7 = 1$.

Example 2:

 <https://assets.leetcode.com/uploads/2022/02/01/screenshot-2022-02-01-at-17-17-45-diagram-drawio-diagrams-net.png>

****Input:**** paint = [[1,4],[5,8],[4,7]] ****Output:**** [3,3,1] ****Explanation:**** On day 0, paint everything between 1 and 4. The amount of new area painted on day 0 is $4 - 1 = 3$. On day 1, paint everything between 5 and 8. The amount of new area painted on day 1 is $8 - 5 = 3$. On day 2, paint everything between 4 and 5. Everything between 5 and 7 was already painted on day 1. The amount of new area painted on day 2 is $5 - 4 = 1$.

****Example 3:****

****Input:**** paint = [[1,5],[2,4]] ****Output:**** [4,0] ****Explanation:**** On day 0, paint everything between 1 and 5. The amount of new area painted on day 0 is $5 - 1 = 4$. On day 1, paint nothing because everything between 2 and 4 was already painted on day 0. The amount of new area painted on day 1 is 0.

****Constraints:****

$1 \leq \text{paint.length} \leq 105$ $1 \leq \text{paint}[i].\text{length} \leq 2$ $0 \leq \text{start}_i < \text{end}_i \leq 5 \cdot 10^4$

Code Snippets

C++:

```
class Solution {
public:
    vector<int> amountPainted(vector<vector<int>>& paint) {

    }
};
```

Java:

```
class Solution {
    public int[] amountPainted(int[][] paint) {

    }
}
```

Python3:

```
class Solution:
    def amountPainted(self, paint: List[List[int]]) -> List[int]:
```