Problem 3009: Maximum Number of Intersections on the Chart

Problem Information

Difficulty: Hard
Acceptance Rate: 45.00%
Paid Only: Yes
Tags: Array, Hash Table, Math, Binary Indexed Tree, Geometry, Line Sweep, Sorting

Problem Description

There is a line chart consisting of `n` points connected by line segments. You are given a **1-indexed** integer array `y`. The `kth` point has coordinates `(k, y[k])`. There are no horizontal lines; that is, no two consecutive points have the same y-coordinate.

We can draw an infinitely long horizontal line. Return _the**maximum** number of points of intersection of the line with the chart_.

Example 1:

Input: y = [1,2,1,2,1,3,2] **Output:** 5 **Explanation:** As you can see in the image above, the line y = 1.5 has 5 intersections with the chart (in red crosses). You can also see the line y = 2 which intersects the chart in 4 points (in red crosses). It can be shown that there is no horizontal line intersecting the chart at more than 5 points. So the answer would be 5.

Example 2:

Input: y = [2,1,3,4,5] **Output:** 2 **Explanation:** As you can see in the image above, the line y = 1.5 has 2 intersections with the chart (in red crosses). You can also see the line y = 2 which intersects the chart in 2 points (in red crosses). It can be shown that there is no horizontal line intersecting the chart at more than 2 points. So the answer would be 2.

Constraints:

* `2 <= y.length <= 105` * `1 <= y[i] <= 109` * `y[i] != y[i + 1]` for `i` in range `[1, n - 1]`

Code Snippets

C++:

```
class Solution {
public:
int maxIntersectionCount(vector<int>& y) {

}
};
```

Java:

```
class Solution {
public int maxIntersectionCount(int[] y) {

}
}
```

Python3:

```
class Solution:
def maxIntersectionCount(self, y: List[int]) -> int:
```