2152. Minimum Number of Lines to Cover Points `Premium`
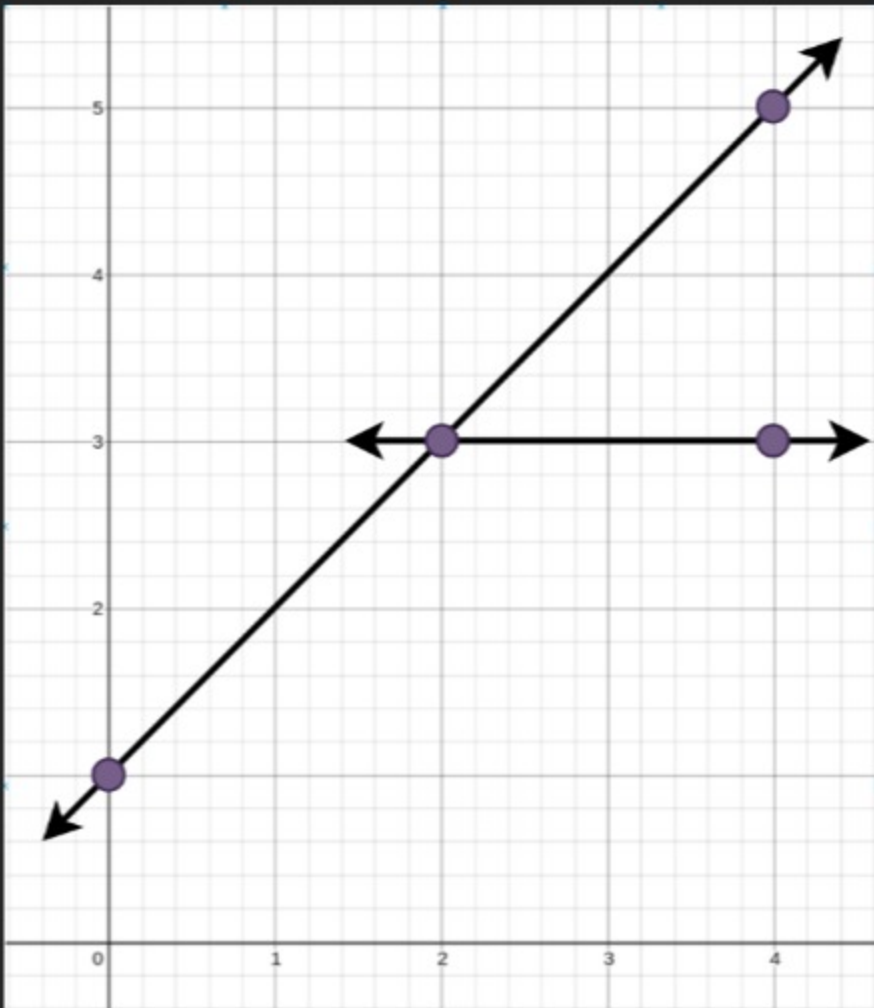
`Medium` `◇ Topics` `▣ Companies` `♀ Hint`

You are given an array `points` where `points[i] = [xᵢ, yᵢ]` represents a point on an **X-Y** plane.

Straight lines are going to be added to the **X-Y** plane, such that every point is covered by at **least** one line.
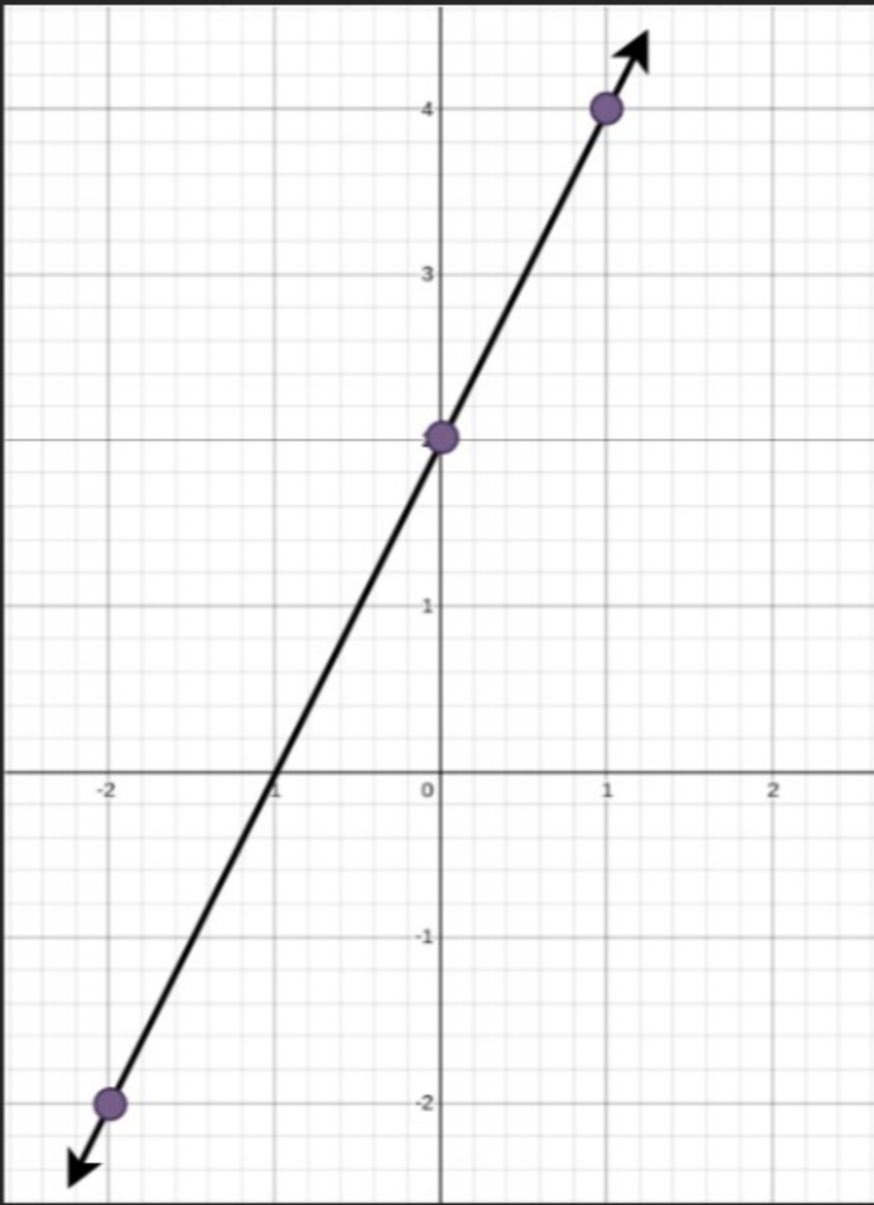
Return *the **minimum** number of **straight lines** needed to cover all the points.*

Example 1:


```
Input: points = [[0,1],[2,3],[4,5],[4,3]]
Output: 2
Explanation: The minimum number of straight lines needed is two. One possible solution is to add:
- One line connecting the point at (0, 1) to the point at (4, 5).
- Another line connecting the point at (2, 3) to the point at (4, 3).
```

Example 2:


```
Input: points = [[0,2],[-2,-2],[1,4]]
Output: 1
Explanation: The minimum number of straight lines needed is one. The only solution is to add:
- One line connecting the point at (-2, -2) to the point at (1, 4).
```

Constraints:

- `1 <= points.length <= 10`
- `points[i].length == 2`
- `-100 <= xᵢ, yᵢ <= 100`
- All the `points` are **unique**.

Seen this question in a real interview before?   1/5

`Yes` `No`

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◇ Topics

`Array` `Hash Table` `Math` `Dynamic Programming` `Backtracking` `Bit Manipulation` `Geometry` `Bitmask`

▣ Companies

0 - 6 months

`Morgan Stanley 2`

♀ Hint 1

What is the highest possible answer for a set of n points?

♀ Hint 2

The highest possible answer is n / 2 (rounded up). This is because you can cover at least two points with a line, and if n is odd, you need to add one extra line to cover the last point.

♀ Hint 3

Suppose you have a line covering two points, how can you quickly check if a third point is also covered by that line?

♀ Hint 4

Calculate the slope from the first point to the second point. If the slope from the first point to the third point is the same, then it is also covered by that line.

▤ Similar Questions

Max Points on a Line	Hard
Min Cost to Connect All Points	Medium
Minimum Lines to Represent a Line Chart	Medium

◯ Discussion (4)