1937. Maximum Number of Points with cost

Medium

Topics

Companies

Hint

You are given an `m x n` integer matrix `points` (**0-indexed**). Starting with `0` points, you want to **maximize** the number of points you can get from the matrix.

To gain points, you must pick one cell in **each row**. Picking the cell at coordinates `(r, c)` will **add** `points[r][c]` to your score.

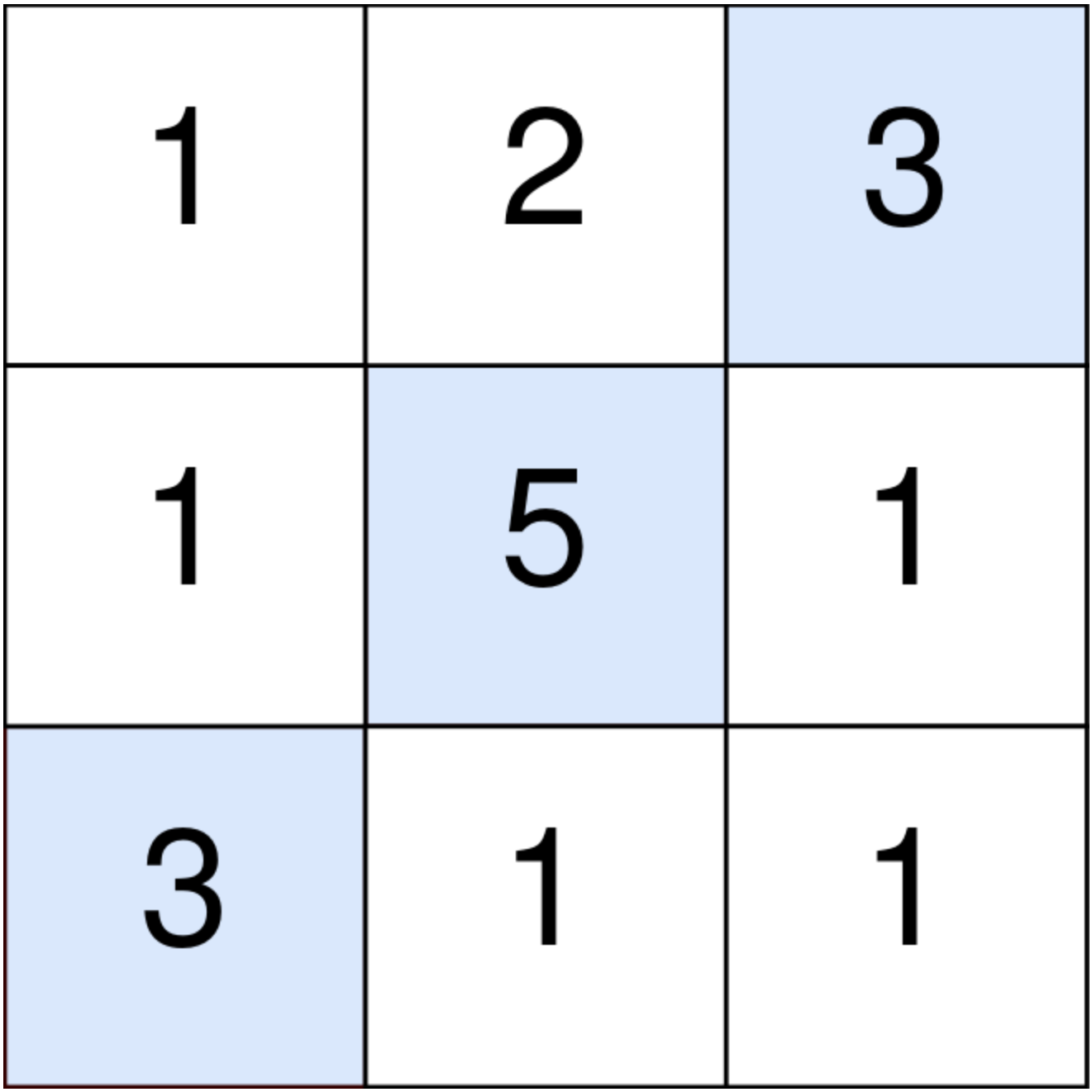
However, you will lose points if you pick a cell too far from the cell that you picked in the previous row. For every two adjacent rows `r` and `r + 1` (where `0 <= r < m - 1`), picking cells at coordinates `(r, c1)` and `(r + 1, c2)` will **subtract** `abs(c1 - c2)` from your score.

Return *the **maximum** number of points you can achieve*.

`abs(x)` is defined as:

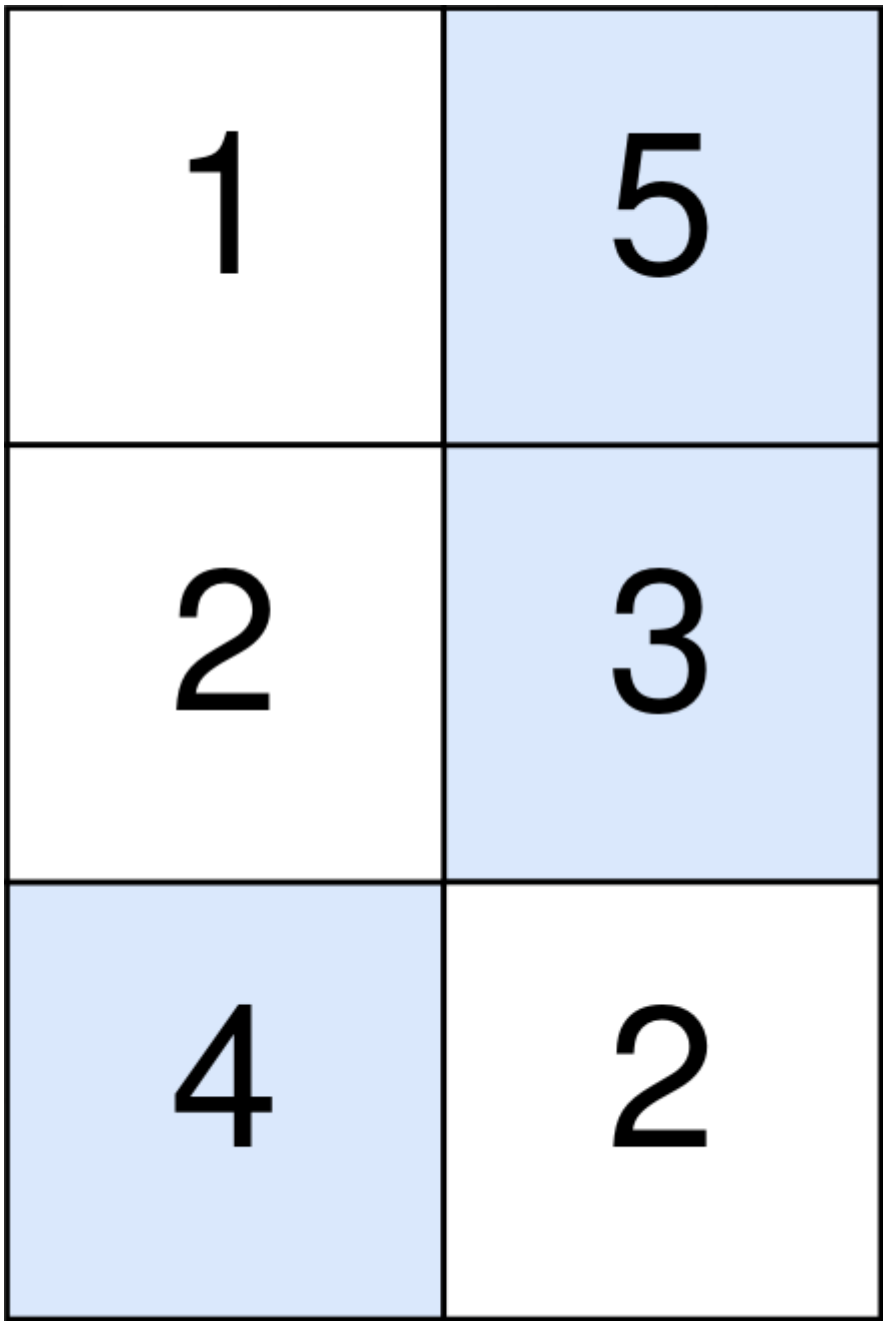
- `x` for `x >= 0`.
- `-x` for `x < 0`.

Example 1:



Input: points = 1,2,3],[1,5,1],[3,1,1
Output: 9
Explanation:
The blue cells denote the optimal cells to pick, which have coordinates (0, 2), (1, 1), and (2, 0).
You add 3 + 5 + 3 = 11 to your score.
However, you must subtract abs(2 - 1) + abs(1 - 0) = 2 from your score.
Your final score is 11 - 2 = 9.

Example 2:



Input: points = 1,5],[2,3],[4,2
Output: 11
Explanation:
The blue cells denote the optimal cells to pick, which have coordinates (0, 1), (1, 1), and (2, 0).
You add 5 + 3 + 4 = 12 to your score.
However, you must subtract abs(1 - 1) + abs(1 - 0) = 1 from your score.
Your final score is 12 - 1 = 11.

Constraints:

- `m == points.length`
- `n == points[r].length`
- `1 <= m, n <= 105`
- `1 <= m * n <= 105`

- `0 <= points[r][c] <= 105`

Solution:

```
class Solution:

    def maxPoints(self, points: List[List[int]]) -> int:

        r, c=len(points), len(points[0])

        for i in range(1, r):

            right=[0]*c

            right[-1]=points[i-1][-1]

            for j in range(c-2, -1, -1):

                right[j]=max(right[j+1]-1, points[i-1][j])

            left=points[i-1][0]

            points[i][0]=max(left, right[0])+points[i][0]

            for j in range(1, c):

                left=max(left-1, points[i-1][j])

                points[i][j]=max(left, right[j])+points[i][j]

        return max(points[-1])
```