

308. Range Sum Query 2D - Mutable

Hard
 666
 75
 Add to List
 Share

Given a 2D matrix `matrix`, handle multiple queries of the following types:

1. **Update** the value of a cell in `matrix`.
2. Calculate the **sum** of the elements of `matrix` inside the rectangle defined by its **upper left corner** `(row1, col1)` and **lower right corner** `(row2, col2)`.

Implement the `NumMatrix` class:

- `NumMatrix(int[][] matrix)` Initializes the object with the integer matrix `matrix`.
- `void update(int row, int col, int val)` **Updates** the value of `matrix[row][col]` to be `val`.
- `int sumRegion(int row1, int col1, int row2, int col2)` Returns the **sum** of the elements of `matrix` inside the rectangle defined by its **upper left corner** `(row1, col1)` and **lower right corner** `(row2, col2)`.

Example 1:

3	0	1	4	2
5	6	3	2	1
1	2	0	1	5
4	1	0	1	7
1	0	3	0	5

→

3	0	1	4	2
5	6	3	2	1
1	2	0	1	5
4	1	2	1	7
1	0	3	0	5

Input

```
["NumMatrix", "sumRegion", "update", "sumRegion"]
[[[[3, 0, 1, 4, 2], [5, 6, 3, 2, 1], [1, 2, 0, 1, 5], [4, 1, 0, 1, 7], [1, 0, 3, 0, 5]]], [2, 1, 4, 3], [3, 2, 2], [2, 1, 4, 3]]
```

Output

```
[null, 8, null, 10]
```

Explanation

```
NumMatrix numMatrix = new NumMatrix([[3, 0, 1, 4, 2], [5, 6, 3, 2, 1], [1, 2, 0, 1, 5], [4, 1, 0, 1, 7], [1, 0, 3, 0, 5]]);
numMatrix.sumRegion(2, 1, 4, 3); // return 8 (i.e. sum of the left red rectangle)
numMatrix.update(3, 2, 2);       // matrix changes from left image to right image
numMatrix.sumRegion(2, 1, 4, 3); // return 10 (i.e. sum of the right red rectangle)
```

Constraints:

- $m == \text{matrix.length}$
- $n == \text{matrix}[i].\text{length}$
- $1 \leq m, n \leq 200$
- $-10^5 \leq \text{matrix}[i][j] \leq 10^5$
- $0 \leq \text{row} < m$
- $0 \leq \text{col} < n$
- $-10^5 \leq \text{val} \leq 10^5$
- $0 \leq \text{row1} \leq \text{row2} < m$
- $0 \leq \text{col1} \leq \text{col2} < n$
- At most 10^4 calls will be made to `sumRegion` and `update`.

Accepted 66,184 Submissions 160,107

Seen this question in a real interview before?

Companies i

Related Topics

Similar Questions

```

1  class NumMatrix {
2
3  public NumMatrix(int[][] matrix) {
4
5      }
6
7  public void update(int row, int col, int val) {
8
9      }
10
11 public int sumRegion(int row1, int col1, int row2, int col2) {
12
13     }
14 }
15
16 /**
17  * Your NumMatrix object will be instantiated and called as such:
18  * NumMatrix obj = new NumMatrix(matrix);
19  * obj.update(row,col,val);
20  * int param_2 = obj.sumRegion(row1,col1,row2,col2);
21  */

```