

Set Matrix to zeroes

73. Set Matrix Zeroes

Solved

Medium Topics Companies Hint

Given an $m \times n$ integer matrix `matrix`, if an element is 0, set its entire row and column to 0's.

You must do it in place.

Example 1:

1	1	1		1	0	1
1	0	1	→	0	0	0
1	1	1		1	0	1

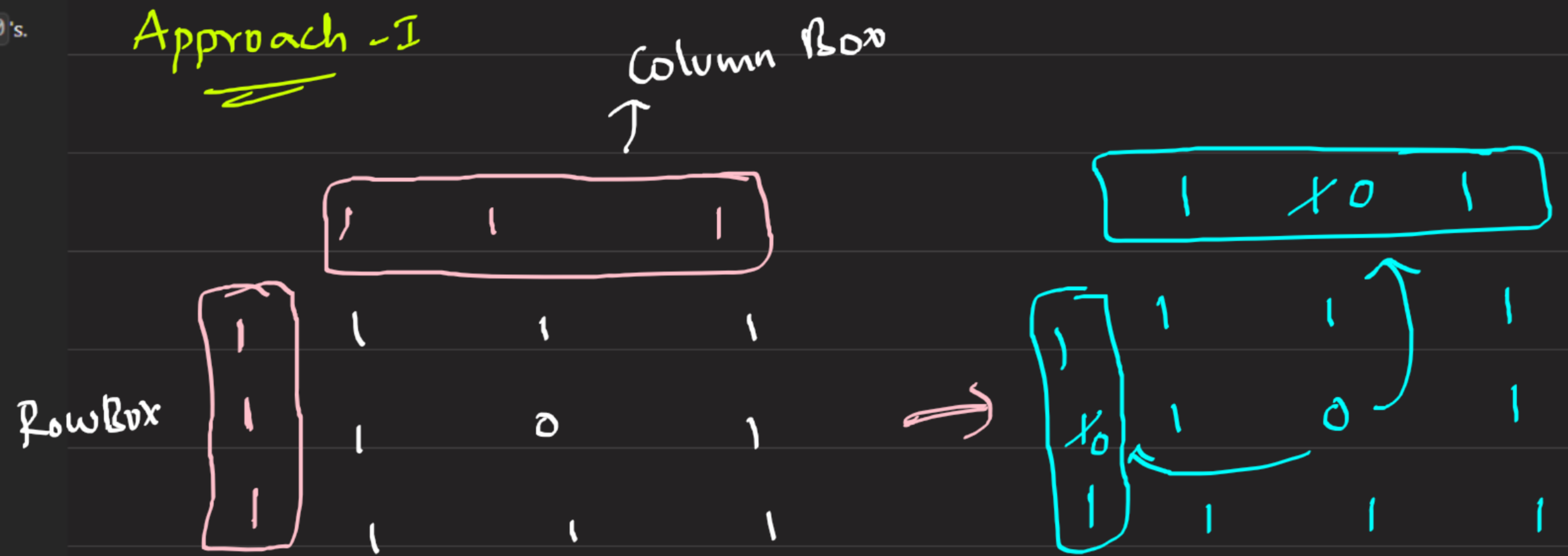
Input: `matrix = [[1,1,1],[1,0,1],[1,1,1]]`
Output: `[[1,0,1],[0,0,0],[1,0,1]]`

Example 2:

0	1	2	0		0	0	0	0
3	4	5	2	→	0	4	5	0
1	3	1	5		0	3	1	0

Input: `matrix = [[0,1,2,0],[3,4,5,2],[1,3,1,5]]`
Output: `[[0,0,0,0],[0,4,5,0],[0,3,1,0]]`

Approach - I



* Create a rowBox & colBox, set to '1' initially

Step 1: Traverse through the array and make rowBox value & colBox value of particular index to zero, if you found matrix value as 0

Step 2: Then re-iterate on matrix & check rowBox & colBox, if any of them is zero, make the matrix value to 0

```
int rowBox[] = new int[ m ]
int colBox[] = new int[ n ]
```

```
for(int i = 0 to m)
    for(int j = 0 to n)
        if(matrix[i][j] == 0) {
            rowBox[i] = 0
            colBox[j] = 0
```

then

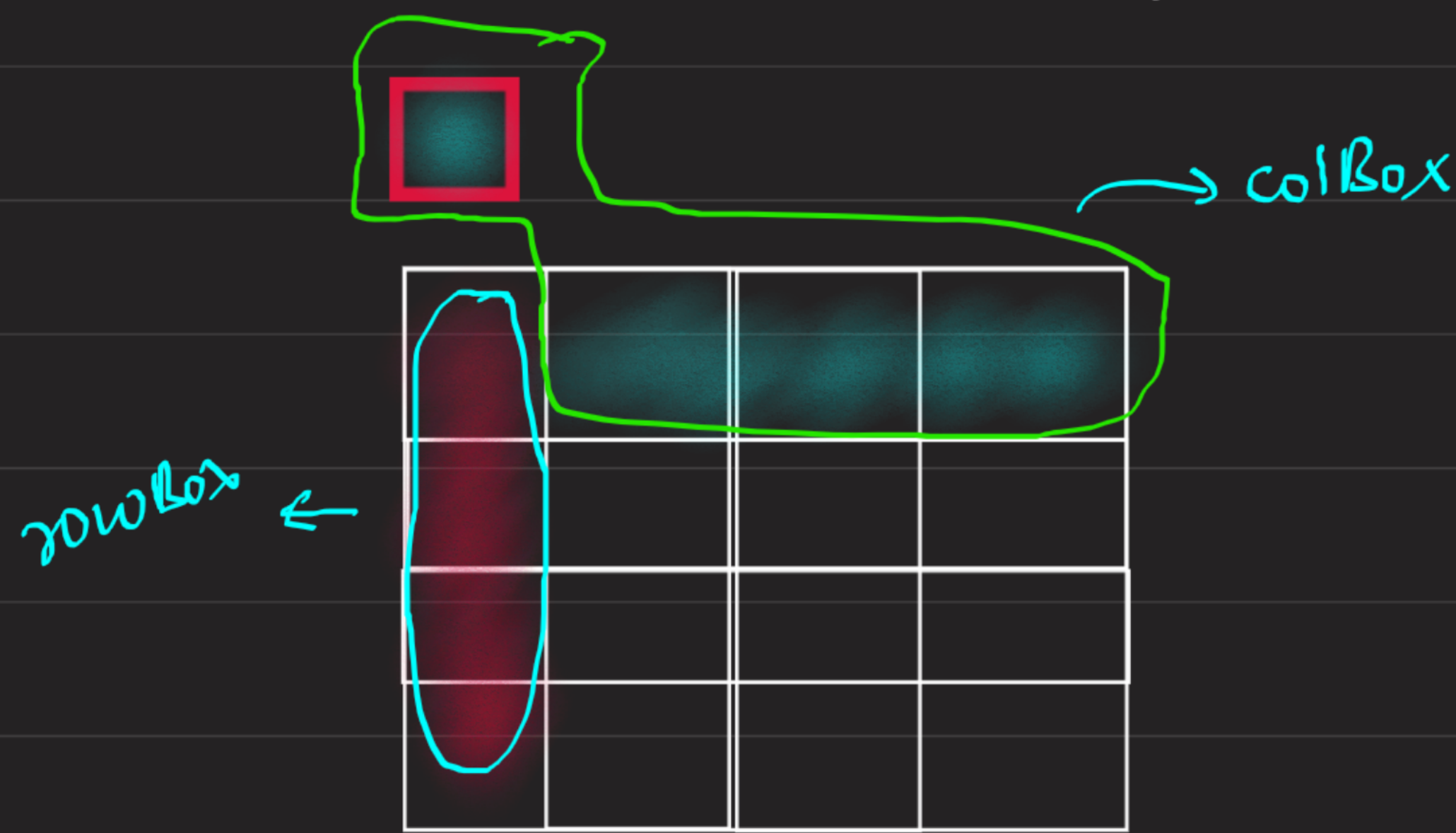
```
for(int i = 0 to m) {
    for(int j = 0 to n)
        if(rowBox[i] == 0 || colBox[j] == 0)
            matrix[i][j] = 0
```

T.C : $O(N^2)$, S.C : $O(N) + O(M)$

😞 we have to reduce Space Complexity ----

Approach

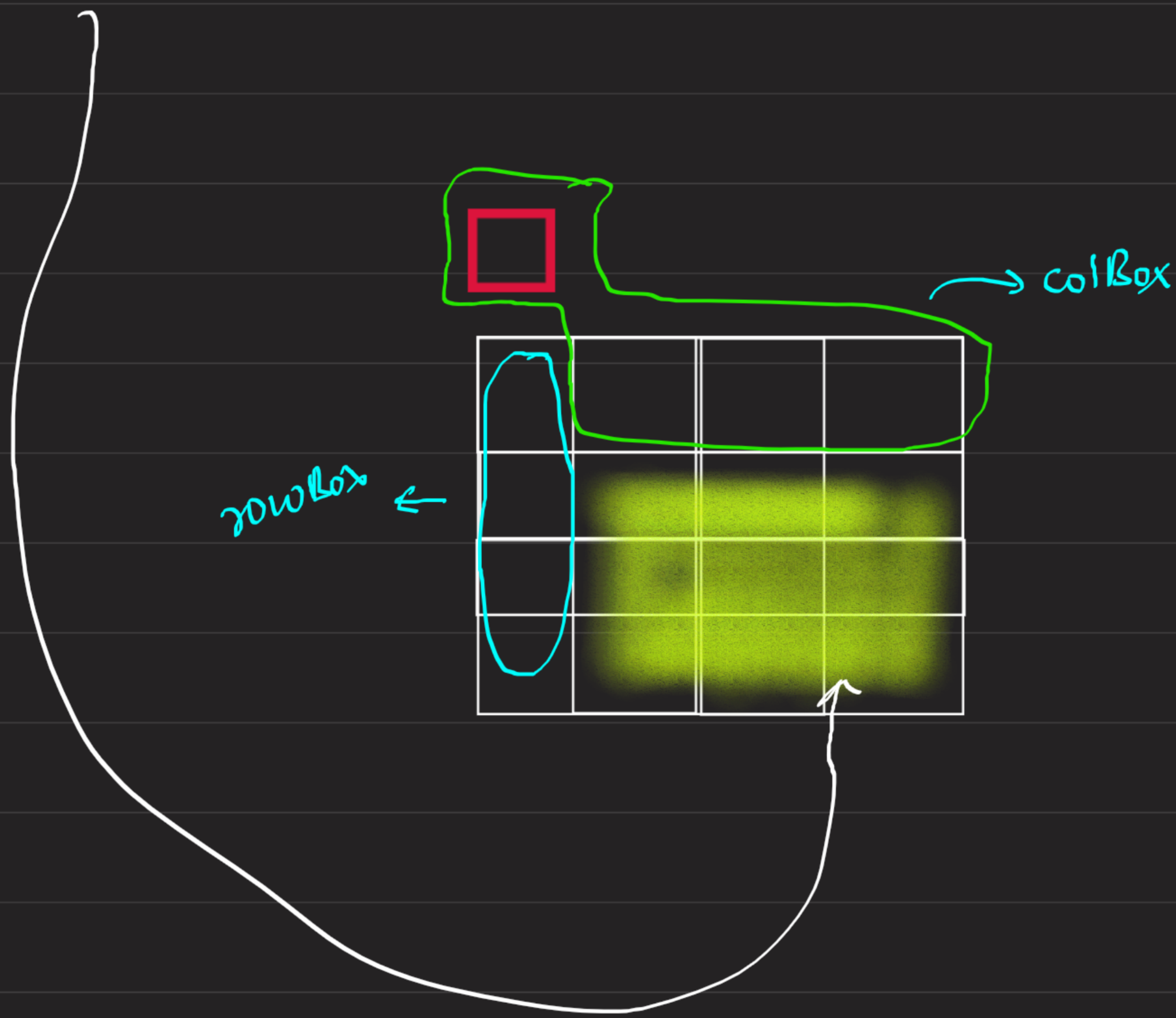
Instead of using seperated arrays for rowBox & colBox



rowBox \Rightarrow col[0]

ColBox \Rightarrow Col 0, row[0]

- * Traverse for $(1,1)$ to $(m \times n)$ without include first row, first column
- * Make rowBox, colBox as zeroes
- * Iterate from $(1,1)$ to $(m \times n)$ again and make them zeroes



- * After that, modify ComboBox \rightarrow means 0th row

Because, 0^{th} row is dependent on 0^{th} col
if you modify 0^{th} col first, then 0^{th}
row ans will change.

- * Then modify \rightarrow 0th column

S.C: $O(1)$