

01 MATRIX.

FIND DISTANCE OF NEAREST 0 FOR EACH CELL.

THINGS TO THINK ABOUT:

DFS OR BFS

WHAT SHOULD BE THE SOURCE??

BRUTE FORCE:

FOR EACH CELL = 1

FIND NEAREST ZERO.

$R \times C \times R \times C$
Iteration

BFS:

For each 1.

start BFS, stop as we encounter first 0.
Some worst case

→ For each zero, BFS.

We would update all 1's that we encounter.

T.C. $O(R \times C)$, Atmost visited once.

O_1 O_2 . LEMMA(;-)

Let's say BFS from O_1 has updated some cell distance this cell, but by nature of BFS, any other zero say O_2 that reaches this cell, cannot be nearer to cell than O_1 .

DFS:

0 1 2 3
0 0 0 0
1 1 1 1
2 1 1 1
3 1 1 1

DOWN/RIGHT/TOP/LEFT

DFS FROM O_{00}

0 0 0 0
1 1 2 9 8
2 2 1 10 7
3 4 5 6

DFS from O_{01}

0 0 0 0
1 1 8 7
2 2 9 6
3 3 4 5

DFS from O_{02}

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

0 0 0 0
1 1 1
2 2 2
3 3 3