Deadly Virus

There is an island in the shape of a square grid of side N. There are citizens residing in this island. Recently, some authorities suspect that some citizen might be affected by the virus. Thanks to the military satellites, you know the exact location of those affected citizens in the grid. Each affected citizen is capable of transferring the virus to their neighbor's and this continues.

[Say if a citizen is located at (x,y) he is capable of affecting citizens residing at (x+1,y),(x-1,y),(x,y+1),(x,y-1)].

Each citizen occupies unit area in the grid and can transmit the virus to their neighbor's in one day. You must find the

minimum number of days in which everyone in the island is affected by the virus. If it is impossible that everyone is infected, return -1.

(No one can enter or leave the island).

Each affected citizen is denoted by 2 and healthy citizen by 1. 0 means no one is residing there.

INPUT:

N: Side of the grid.

Next N lines contain values in the grid.

INPUT CONSTRAINTS:

1<=N<=10

Assume grid[i][j] to be a value in the grid.

grid[i][j] can be 0,1,2.

OUTPUT:

Minimum number of days by which every citizen in the island is affected.

Sample Input:

3

2 1 1

1 1 0

0 1 1

Sample output:

4

Explanation:

2	1	1
1	1	0
0	1	1

2	2	1
2	1	0
0	1	1

2	2	2
2	2	0
0	1	1

DAY 0   **DAY 1**   **DAY 2**

2	2	2
2	2	0
0	2	1

2	2	2
2	2	0
0	2	2

DAY 3   **DAY 4**