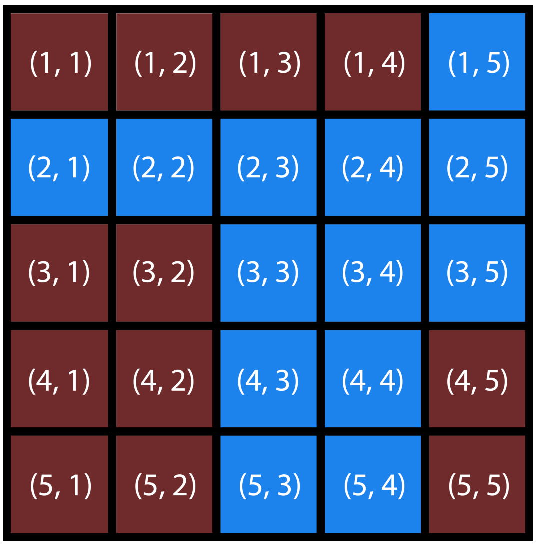
Problem D. Connect

Time limit 1000 ms
Mem limit 262144 kB

Alice lives on a flat planet that can be modeled as a square grid of size $n \times n$, with rows and columns enumerated from 1 to n. We represent the cell at the intersection of row r and column c with ordered pair (r, c). Each cell in the grid is either *land* or *water*.



An example planet with $n = 5$. It also appears in the first sample test.

Alice resides in *land* cell (r_1, c_1). She wishes to travel to *land* cell (r_2, c_2). At any moment, she may move to one of the cells adjacent to where she is—in one of the four directions (i.e., up, down, left, or right).

Unfortunately, Alice cannot swim, and there is no viable transportation means other than by foot (i.e., she can walk only on *land*). As a result, Alice's trip may be impossible.

To help Alice, you plan to create **at most one** tunnel between some two *land* cells. The tunnel will allow Alice to freely travel between the two endpoints. Indeed, creating a tunnel is a lot of effort: the cost of creating a tunnel between cells (r_s, c_s) and (r_t, c_t) is $(r_s - r_t)^2 + (c_s - c_t)^2$.

For now, your task is to find the minimum possible cost of creating at most one tunnel so that Alice could travel from (r_1, c_1) to (r_2, c_2). If no tunnel needs to be created, the cost is 0.

Input

The first line contains one integer n $(1 \leq n \leq 50)$ — the width of the square grid.

The second line contains two space-separated integers r_1 and c_1 $(1 \leq r_1, c_1 \leq n)$ — denoting the cell where Alice resides.

The third line contains two space-separated integers r_2 and c_2 $(1 \le r_2, c_2 \le n)$ — denoting the cell to which Alice wishes to travel.

Each of the following n lines contains a string of n characters. The j-th character of the i-th such line $(1 \le i, j \le n)$ is `0` if (i, j) is *land* or `1` if (i, j) is *water*.

It is guaranteed that (r_1, c_1) and (r_2, c_2) are *land*.

Output

Print an integer that is the minimum possible cost of creating at most one tunnel so that Alice could travel from (r_1, c_1) to (r_2, c_2).

Sample 1

Input	Output
5 1 1 5 5 00001 11111 00111 00110 00110	10

Sample 2

Input	Output
3 1 3 3 1 010 101 010	8

Note

In the first sample, a tunnel between cells $(1, 4)$ and $(4, 5)$ should be created. The cost of doing so is $(1 - 4)^2 + (4 - 5)^2 = 10$, which is optimal. This way, Alice could walk from $(1, 1)$ to $(1, 4)$, use the tunnel from $(1, 4)$ to $(4, 5)$, and lastly walk from $(4, 5)$ to $(5, 5)$.

In the second sample, clearly a tunnel between cells $(1, 3)$ and $(3, 1)$ needs to be created. The cost of doing so is $(1 - 3)^2 + (3 - 1)^2 = 8$.