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1 . Topic

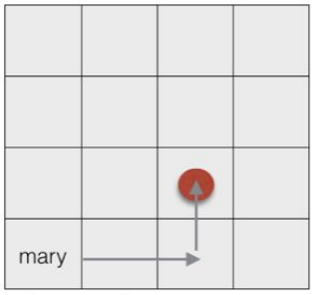
breadth-first search

2 . Description

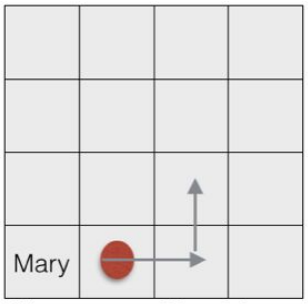
There is a 9*9 array. Mary wants to walk from point A(x, y) to B(p, q). However, there may be N holes on the road, and she can not walk onto them. The thing you have to note is that Mary can only move in an "L"-shape: two squares vertically and one square horizontally, or two squares horizontally and one square vertically.

Your program have to determine a route along which the number of move is smallest.

*She can go through a hole(the red point), but the third square can't be a hole:



She can't go



She can go like this

*A(x, y) and B(p, q) may be a hole. If B(p, q) is a hole, then the third square of the last move can be a hole.

3 . Input and output format

Input:

The first line of the input is N(the number of holes), it will be followed by a list of N points on which are holes. ($0 \le N \le 81$)

The second line of the input is M(the number of cases). ($0 \le M < 6500$)

The following M lines of input are A(x, y) and B(p, q).($1 \le x, y \le 9$)

($a \le p, q \le i$)

	1	2	3	4	5	6	7	8	9
a									
b									
c									
d									
e									
f									
g									
h									
i									

Output:

Going from A(x, y) to B(p, q) needs K(smallest number of moves) moves.

Example:

Input:

2 c3 g3

3

e2 e4

a2 e4

i9 i9

Output:

Going from e2 to e4 needs 4 moves.

Going from a2 to e4 needs 4 moves.

Going from i9 to i9 needs 0 moves.

4 . Sample input and output

input1

```
8 a1 b1 c4 d4 e2 e4 f1 f3
1
c2 d2
```

output1

Going from c2 to d2 needs 5 moves.

input2

```
0
5
e2 e4
a1 b2
b2 c3
a1 h8
a1 h7
```

output2

Going from e2 to e4 needs 2 moves.
Going from a1 to b2 needs 4 moves.
Going from b2 to c3 needs 2 moves.
Going from a1 to h8 needs 6 moves.
Going from a1 to h7 needs 5 moves.

5 . Time and memory limit

- Time: 1 sec
- Memory: 10 MB