The knight and grass

Cost: 10 | Solved: 58

Memory limit: 256 MBs

Time limit: 1 s

Input: standard input

Output: standard output

Task:

You are given a chessboard of n rows and m columns. There's an integer number on each cell of the board and the knight staying in cell (x_1, y_1). He wants to reach the cell (x_2, y_2) where tasty grass grows.

What's the minimal number of steps he has to do to reach the cell?

The knight can go in 8 directions.

Input:

The first line contains two naturals n and m – the quantity of rows and columns of the chessboard ($2 \le n, m \le 20$).

The second line contains coordinates (x_1, y_1) of the cell the knight stands in ($1 \le x_1 \le n$, $1 \le y_1 \le m$).

The third line contains coordinates (x_2, y_2) of the cell the knight needs to reach ($1 \le x_2 \le n$, $1 \le y_2 \le m$).

The upper-left corner's coordinates are (1, 1), the lower-right corner's – (n, m).

Output:

The first line should contain the minimal number of steps k.

The next $k+1$ lines should contain two numbers – coordinates of knight's next cell to move to (the first of them must be the cell (x_1, y_1)).

If it's impossible to reach (x_2, y_2), write -1.

Example:

Input	Output
5 5 3 3 5 1	4 3 3 2 1 1 3 3 2 5 1