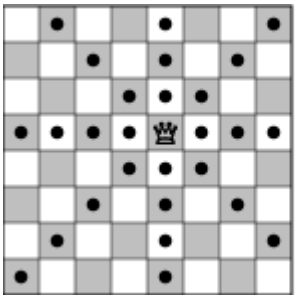
Queen

The Problem

The game of Chess has several pieces with curious movements. One of them is the *Queen*, which can move any number of squares in any direction: in the same line, in the same column or in any of the diagonals, as illustrated by the figure below (black dots represent positions the queen may reach in one move):



The great Chess Master Kary Gasparov invented a new type of chess problem: given the position of a queen in an empty standard chess board (that is, an 8 x 8 board) how many moves are needed so that she reaches another given square in the board?
Kary found the solution for some of those problems, but is having a difficult time to solve some others, and therefore he has asked that you write a program to solve this type of problem.

The Input

The input contains several test cases. The only line of each test case contains four integers X_1, Y_1, X_2 and Y_2 ($1 \leq X_1, Y_1, X_2, Y_2 \leq 8$). The queen starts in the square with coordinates (X_1, Y_1), and must finish at the square with coordinates (X_2, Y_2). In the chessboard, columns are numbered from 1 to 8, from left to right; lines are also numbered from 1 to 8, from top to bottom. The coordinates of a square in line X and column Y are (X, Y).
The end of input is indicated by a line containing four zeros, separated by spaces.

The Output

For each test case in the input your program must print a single line, containing an integer, indicating the smallest number of moves needed for the queen to reach the new position.

Sample Input

```
4 4 6 2
3 5 3 5
5 5 4 3
0 0 0 0
```

Sample Output

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1
0
2
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