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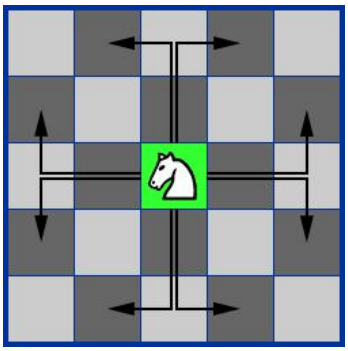
Problem 5: Knight

In Chess, the knight is the weirdest of all the pieces. To begin with, the piece is actually a horse without any human riding it. The second reason is its movement pattern. It can move 2 cells forward and one to the side. Below you can see all the possible destinations of a knight.



With a movement pattern so weird, it is complicated to know what's the shortest path between two board squares. Can you write a program that computes the minimum number of movements needed to move a knight from one square to another? Remember that a chessboard has 8 rows and 8 columns. Also in the standard notation, the columns are represented by letters from a to h.

	a	b	c	d	e	f	g	h	
8	a8	b8	c8	d8	e8	f8	g8	h8	8
7	a7	b7	c7	d7	e7	f7	g7	h7	7
6	a6	b6	c6	d6	e6	f6	g6	h6	6
5	a5	b5	c5	d5	e5	f5	g5	h5	5
4	a4	b4	c4	d4	e4	f4	g4	h4	4
3	a3	b3	c3	d3	e3	f3	g3	h3	3
2	a2	b2	c2	d2	e2	f2	g2	h2	2
1	a1	b1	c1	d1	e1	f1	g1	h1	1
	a	b	c	d	e	f	g	h	

Input

The input will contain 2 lines. The first line will be the starting position of the knight and the second line will specify its final position.

Output

Output a single integer specifying the minimum number of moves for the knight to get from it's starting position to it's final position on the board.

Examples

Input	Output
`h1` `a8`	`6`
`b1` `b1`	`0`
`e2` `e4`	`2`