Hanoi Chips

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

In the city of Hanoi, in addition to the famous tower of Brahma, there is also the number line of Brahma. There are three identical chips placed in integer coordinates somewhere on this line. You can move these chips according to the following rule: take any chip (one at a time) and place it in the new position, which must be symmetrical relative to one of the two other chips. For example, if chips' coordinates are 1, 4, and 6, you can move the chip from 4 to either -2 (symmetrically relative to the first chip) or to 8 (symmetrically relative to the third chip). Multiple chips can occupy the same spot.

According to one of the legends, treasures will rain from the sky as soon as chips occupy certain positions on that line. Of course, nobody knows the exact coordinates where the chips should be, but you have a guess.

Given the starting and final arrangement of the chips, determine if the final arrangement is reachable, and, if possible, find a sequence of moves. The number of moves might not be optimal, but should not exceed 10^5. You cannot move a chip into a coordinate greater than 10^9 by absolute value.

Input

The first line of the input contains three integers x_1, x_2, x_3 ($-10^4 \le x_i \le 10^4$) — the starting arrangement of the three chips.

The second line of the input contains three integers y_1, y_2, y_3 ($-10^4 \le y_i \le 10^4$) — the final arrangement.

Output

If it's impossible to achieve the final arrangement, output a single integer "-1" (without quotes).

Otherwise, output a single integer k ($0 \le k \le 10^5$) — the number of moves. Then, print all moves (each one in a separate line) in the following format: the first number is the coordinate of the chip being moved, and the second is its new position. All coordinates should not exceed 10^9 by absolute value.

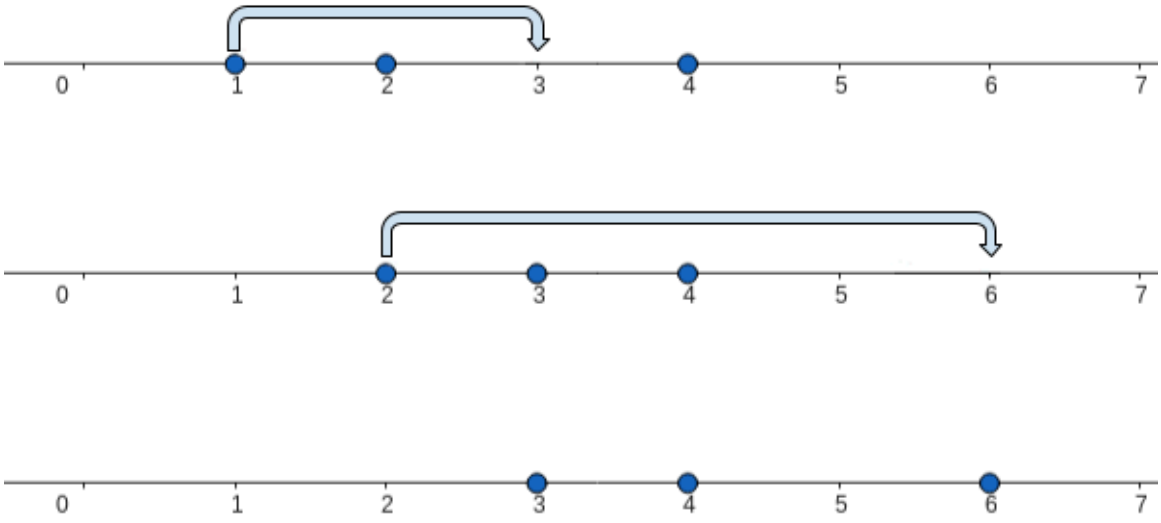
Scoring

Subtask	Points	Constraints
1	17	Both in the starting and final arrangement, three chips occupy three consecutive spots (for example, $3, 4, 5$ or $-7, -9, -8$)
2	20	$0 \le x_i, y_i \le 50$
3	25	The final arrangement is reachable by at most ≤ 8 moves
4	38	No additional constraints

Examples

standard input	standard output
1 2 4 3 4 6	2 1 3 2 6
1 2 2 1 2 3	-1
1 4 5 -3 -2 -1	4 4 -2 5 -3 -3 -1 1 -3

Note

Please note that since the chips are identical, the chips do not have to finish at the corresponding coordinates in the end. For example, x_1 can go to y_2, x_2 to y_3 and x_3 to y_1.

In the first example, you need to move chips from the coordinates $(1, 2, 4)$ to the coordinates $(3, 4, 6)$. To achieve this, you can make two moves: move the chip from 1 to 3 and then another chip from 2 to 6.