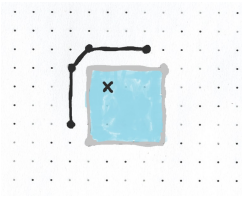
Problem A
Avoiding the Abyss



This picture represents sample 1. The path taken avoids the hidden pool, but based on the information given it could also have intersected it. So the sample solution was quite lucky here.

You are standing on a point with integer coordinates (x_s, y_s). You want to walk to the point with integer coordinates (x_t, y_t). To do this, you can walk along a sequence of line segments. But there is a swimming pool in your way. The swimming pool is an axis aligned rectangle whose lower left corner is on the point (x_l, y_l) and the upper right corner is on the point (x_r, y_r). You cannot ever cross the swimming pool, not even on the border. However, it is dark and you do not know the coordinates (x_l, y_l) and (x_r, y_r). Instead, you threw a rock into the pool which revealed that the point (x_p, y_p) is in the pool (or on the boundary).

Find a way to walk from the start to the end point along a sequence of line segments, so that you never cross the swimming pool.

Input

The first line contains two integers x_s and y_s ($-10^4 \leq x_s, y_s \leq 10^4$).

The second line contains two integers x_t and y_t ($-10^4 \leq x_t, y_t \leq 10^4$).

The third line contains two integers x_p and y_p ($-10^4 \leq x_p, y_p \leq 10^4$).

The problem is not adaptive, i.e. for every test case there exist four integers x_l, y_l, x_r, y_r ($-10^4 \leq x_l < x_r \leq 10^4$, $-10^4 \leq y_l < y_r \leq 10^4$) that constitute a swimming pool. The start and end points are always strictly outside the swimming pool, and the point (x_p, y_p) is inside (or on the border). The start and end points are always distinct.

Output

First, print one integer N ($0 \leq N \leq 10$), the number of points in between the start and end point that you want to visit. Then, print N lines, the ith containing two integers x_i, y_i. These coordinates must satisfy $-10^9 \leq x_i, y_i \leq 10^9$. Note that these are not the same bounds than on the other coordinates.

This means that you will walk along straight line segments between $(x_s, y_s), (x_1, y_1), \ldots, (x_N, y_N), (x_t, y_t)$ such that none of the line segments touch the swimming pool. It can be proven that a solution always exists.

Sample Input 1	Sample Output 1
0 0 4 4 2 2	2 0 3 1 4

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