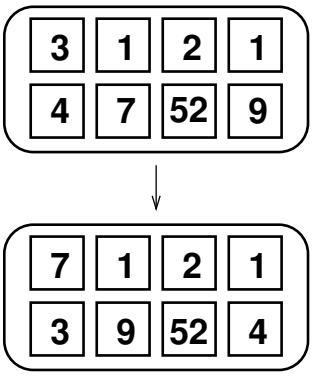
Problem C

Containers



The CBS–Container Balancing System needs to be updated so as to work with a new class of ships, the "two by four", which are ships that can carry eight large containers disposed in two lines and four columns, exactly as shown in the figure. These ships have a fixed crane that can perform a single type of movement: picking up two adjacent containers, in a row or column, and exchange their position. To speed up the loading process in the harbor, the eight containers are placed in any of the eight positions, defining an initial configuration. When ship leaves the harbor, the crane needs to move the containers so they end in a predefined final configuration.

The problem is that the cost for the crane to perform one movement is equal to the sum of the weights of the two adjacent containers whose positions are being exchanged. Given the weights of the containers in each position of both the initial and final configurations, the CBS has to compute the minimum possible total cost for a sequence of movements that leads from the initial to the final configuration.

Input

The input consists of four lines containing, each one, four integers between 1 and 1000, inclusive. The first two lines define the weights of the initial configuration and the last two lines, the weigths in the final configuration. There is always a solution, as the containers in the initial and final configurations are the same, possibly in different positions.

Output

Output a line containing an integer, representing the minimum possible total cost for a sequence of movements that leads from the initial to the final configuration.

Examples

Examples

Input	Output
3 1 2 1 4 7 52 9 7 1 2 1 3 9 52 4	81 50
1 2 3 4 5 10 7 8 1 2 3 4 5 8 7 10	0
34 5 6 998 4 17 77 84 34 5 6 998 4 17 77 84	