**Tale of Cities**

You decide to go for a very long drive on a very straight road. Along this road are five cities. As you travel, you record the distance between each pair of consecutive cities. You would like to calculate a distance table that indicates the distance between any two of the cities you have encountered.

Input

The first line contains 4 positive integers less than 1000, each representing the distances between consecutive pairs of consecutive cities: specifically, the ith integer represents the distance between city i and city i + 1.

Output

The output should be 5 lines, with the ith line (1 ≤ i ≤ 5) containing the distance from city i to cities 1, 2, ... 5 in order, separated by one space.

Sample Input

3 10 12 5

Output for Sample Input

0 3 13 25 30

3 0 10 22 27

13 10 0 12 17

25 22 12 0 5

30 27 17 5 0

Explanation of Output for Sample Input

The first line of output contains:

• 0, since the distance from city 1 to city 1 is 0;

• 3, since the distance between city 1 and city 2 is 3;

• 13, since the distance between city 1 and city 3 is 3 + 10 = 13;

• 25, since the distance between city 1 and city 4 is 3 + 10 + 12 = 25;

• 30, since the distance between city 1 and city 5 is 3 + 10 + 12 + 5 = 30.