

Problem 10. Ostap and chairs

Input file: .txt
Output file: output.txt
Time limit: 1 second
Memory limit: 256 megabytes

There is an emotional moment in the computer game called «Ostap and chairs», when each Ostap, from a crowd of tiny Ostaps, runs to his own chair. The graphics of the event has been drawn already: there are two images — the first image is of Ostaps (with predefined coordinates x_i), and the second image is of the chairs (their coordinates y_i are also known).

Before you start a game, you cannot move Ostaps or chairs, but you can change the scale of the second picture using a linear transformation $y_i \rightarrow k * y_i + b$. After that, the first Ostap runs to the first chair, then the second Ostap runs to the second chair, etc., and the total elapsed time is summed up. The player's task is to make this time as short as possible, i.e. minimize the total summarized distance.

Your task is to find the minimum possible value:

$$\sum_{i=1}^N |x_i - (ky_i + b)|$$

Input

The first line of the input file contains a single integer N — the number of Ostaps and chairs ($2 \leq N \leq 300$). Each of the following two lines contains N integers: the second line of the file contains x_i — the coordinates of Ostaps, the third line contains y_i — the coordinates of chairs ($1 \leq i \leq N$, $|x_i|, |y_i| \leq 10^3$). All x_i are different, all y_i are different.

Output

In your answer, print three real numbers: D — the minimum possible value of the total distance, K and B — coefficients, with which such distance is achievable.

The relative or absolute deviation of the distance D from the optimal must not exceed 10^{-9} . The total distance calculated using the coefficients K and B must match D with the same precision.

Examples

input.txt	output.txt
3 0 3 -5 4 1 -2	5.5 0.8333333333 -3.3333333333
2 -7 12 -7 12	0 1 0