

Food Mixing

Problem ID: foodmixing



A Volbonan cooking stew.

The Volbonans of the Luncheon Kingdom are cooking their famous Stupendous Stew! For the Volbonans, Stupendous Stew is simply any soup that has saltiness level x and sweetness level y .

However, Bowser has stolen all of their ingredients! All they have left are existing soups: n soups of varying salt levels a_1, a_2, \dots, a_n and sweetness levels b_1, b_2, \dots, b_n . The Volbonans are attempting to salvage the situation by mixing their soups into a Stupendous Stew.

The saltiness and the sweetness of a mixture of soups is given by the weighted sum of the soups used to make it. For example if a mixture consisted of 75% of a soup of 3 saltiness and 25% of a soup of 5 saltiness, it would have a saltiness of 3.5.

More formally, for each soup $i = 1, \dots, n$, let p_i ($0 \leq p_i \leq 1$) denote the proportion of soup i used in a mixture. Then, the saltiness of the mixture is given by $\sum_{i=1}^n p_i a_i$ and the sweetness is $\sum_{i=1}^n p_i b_i$. The sum of all p_i must be 1.

Tell the Volbonans if they can make Stupendous Stew. If they can, tell them how to make it.

Input

The first line of input is an integer $1 \leq n \leq 100\,000$, representing the number of existing soups. The following line contains n integers a_1, a_2, \dots, a_n ($0 \leq a_i \leq 1\,000$), the saltiness levels of the n soups. The following line contains n integers b_1, b_2, \dots, b_n ($0 \leq b_i \leq 1\,000$), the sweetness levels of the n soups. The last line contains integers x and y ($0 \leq x, y \leq 1\,000$), the target saltiness and sweetness levels.

Output

If it is possible to make the Stupendous Stew, on the first line print “Yes” followed by a second line with proportions of each soup used in the mixture p_1, p_2, \dots, p_n . Otherwise, print “No”.

If it is possible to make the Stupendous Stew, your answer will be accepted if both the sweetness of your mixture and the saltiness do not exceed an absolute or relative error of 10^{-6} .

Sample Input 1

4
1 2 4 5
1 1 1 3
3 2

Sample Output 1

Yes
0.5 0.0 0.0 0.5

Sample Input 2

4
1 2 4 5
1 1 1 4
3 2

Sample Output 2

Yes
0.44444444 0.00000000 0.22222222 0.33333333

Sample Input 3

3
7 8 7
8 7 7
8 8

Sample Output 3

No
