

H Statues

The mayor of a city wants to place n statues at intersections around the city. The intersections in the city are at all points (x, y) with integer coordinates. Distances between intersections are measured using Manhattan distance, defined as follows:

$$\text{distance}((x_1, y_1), (x_2, y_2)) = |x_1 - x_2| + |y_1 - y_2|.$$

The city council has provided the following requirements for the placement of the statues:

- The first statue is placed at $(0, 0)$;
- The n-th statue is placed at (a, b);
- For $i = 1, \ldots, n-1$, the distance between the i-th statue and the $(i+1)$-th statue is d_i.

It is allowed to place multiple statues at the same intersection.

Help the mayor find a valid arrangement of the n statues, or determine that it does not exist.

Input

The first line contains an integer n ($3 \leq n \leq 50$) — the number of statues.

The second line contains two integers a and b ($0 \leq a, b \leq 10^9$) — the coordinates of the intersection where the n-th statue must be placed.

The third line contains $n-1$ integers $d_1, \ldots, d_{n-1}$ ($0 \leq d_i \leq 10^9$) — the distance between the i-th statue and the $(i+1)$-th statue.

Output

Print `YES` if there is a valid arrangement of the n statues. Otherwise, print `NO`.

If there is a valid arrangement, print a valid arrangement in the following n lines. The i-th of these lines must contain two integers x_i and y_i — the coordinates of the intersection where the i-th statue is placed. You can print any valid arrangement if multiple exist.

Samples

Sample input 1	Sample output 1
3 5 8 9 0	NO

Explanation of sample 1.
There is no valid arrangement of the 3 statues.

Sample input 2	Sample output 2
4 10 6 7 8 5	YES 0 0 6 -1 11 2 10 6

Explanation of sample 2.
The sample output is shown in the following picture. Note that this is not the only valid arrangement of the 4 statues.

