Problem J
Jungle Game


Rainforest, public domain

Denise is designing a rainforest themed board game. The goal of the game is for each player to form a team of two characters and complete various challenges.

There are N different characters numbered from 1 to N. Each character i has two attributes p_i and s_i (problem solving skill and strength). The numbers p_i and s_i are positive integers satisfying $1 \leq p_i, s_i \leq N$. Before the game starts, each player will pick two characters i and j to form a team. It is possible to pick two copies of the same character. The total problem solving skill and strength of the team will be $p_i + p_j$ and $s_i + s_j$ respectively.

In the game there are also N challenge cards numbered from 1 to N. Each of these also has two attributes P_k and S_k. Denise has already designed the challenge cards and decided on the values of all numbers $P_1, P_2, \ldots, P_N$ and $S_1, S_2, \ldots, S_N$. However, the rules of the game assume that it is not possible for a player to form a team whose problem solving skill and strength are both the same as one of the challenge cards. In other words, the situation

$$p_i + p_j = P_k \text{ and } s_i + s_j = S_k$$

should never occur for any triple i, j, k (note that i can be equal to j).

The only thing left to do is to decide the N distinct pairs $(p_1, s_1), (p_2, s_2) \ldots, (p_N, s_N)$ such that $1 \leq p_i, s_i \leq N$ and the situation above never happens.

Input

The first line contains the integer N ($1 \leq N \leq 2000$).

The following N lines contain the values of the challenge cards P_i, S_i ($2 \leq P_i, S_i \leq 2 \cdot N$).

Output

If there is no solution, print "NO". Otherwise, print "YES" followed by N lines, each containing a pair of integers p_i, s_i ($1 \leq p_i, s_i \leq N$). These pairs of integers must be distinct. In other words, you may not have two indices $i \neq j$ with $p_i = p_j$ and $s_i = s_j$.

Sample Input 1	Sample Output 1
5 5 5 5 6 6 5 6 6 8 8	YES 2 2 1 1 1 2 2 1 1 3

Sample Input 2	Sample Output 2
1 2 2	NO

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