

# Jungle Game

## Problem ID: junglegame

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  $P_1, P_2, \dots, P_N$  and  $S_1, S_2, \dots, S_N$ . 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  $(p_1, s_1), (p_2, s_2), \dots, (p_N, s_N)$  such that  $1 \leq p_i, s_i \leq N$  and the situation above never happens.

### Input

The first line contains the integer  $N$  ( $1 \leq N \leq 10\,000$ ).

The following  $N$  lines contain the values of the challenge cards  $P_i, S_i$  ( $1 \leq P_i, S_i \leq 2 \cdot N$ ).

### 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

5	YES
5 5	2 2
5 6	1 1
6 5	1 2
6 6	2 1
8 8	1 3

#### Sample Output 1

#### Sample Input 2

1	NO
2 2	

#### Sample Output 2