Reconstructing Pairs

Input file:	`standard input`
Output file:	`standard output`
Time limit:	6 seconds
Memory limit:	512 megabytes

There are two multisets of integers A and B of size n (possibly containing repeated numbers). We divided all elements of A and B into n pairs so that each pair contains one number from A and one number from B. After that, we arbitrarily rearranged these pairs, and then chose some pairs and swapped two elements inside those pairs (other pairs were left unchanged).

Restore the initial division into pairs or figure out that it is not possible.

Input

The first line contains an integer n ($1 \le n \le 5 \cdot 10^4$). The second line contains n integers a_i ($1 \le a_i \le 10^5$) — the contents of multiset A. The third line contains n integers b_i ($1 \le b_i \le 10^5$) — the contents of multiset B. Next n lines contain pairs after the rearrangement. The i-th line contains a pair s_i, t_i ($1 \le s_i, t_i \le 10^5$).

Output

If it's impossible to restore original pairs, print "`NO`". If it's possible, print "`YES`" in the first line. Then, print original pairs in the next n lines, each pair on a separate line. Multiset A must consist of the first elements of each pair. Multiset B must consist of the second elements of each pair. Any list of pairs consistent with the input data will be accepted as correct.

Scoring

Subtask	Score	Constraints
1	15	$n \le 16$
2	10	$n \le 5 \cdot 10^4$, A and B don't contain duplicates (but A and B can share common elements)
3	20	$n \le 5 \cdot 10^4$, multisets A and B are equal
4	30	$n \le 2 \cdot 10^3$
5	25	$n \le 5 \cdot 10^4$

Examples

standard input	standard output
5 1 2 2 4 4 2 2 3 4 5 1 3 2 4 2 4 5 4 2 2	YES 1 3 4 2 2 4 4 5 2 2
3 1 2 3 4 1 5 4 1 2 3 1 5	NO