Problem J. JAG Graph Isomorphism

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	1024 mebibytes

Consider the JAG Graph as the undirected simple connected graph that consists of N vertices numbered from 1 to N and N edges.

Given two JAG graphs G and G'. Are these graphs isomorphic? In other words, is there a permutation $(p_1, \ldots, p_N)$ of $(1, \ldots, N)$ such that G has an edge which connects two vertices u and v if and only if G' has an edge which connects p_u and p_v?

Input

The first line of the input contains a single integer N ($3 \le N \le 2 \times 10^5$), which represents the number of vertices of graphs G and G'. Each of the next N lines contains two integers a_i and b_i ($1 \le a_i, b_i \le N$), which represent that there is an undirected edge connecting vertices a_i and b_i of G. Similarly, each of the next N lines contains two integers c_i and d_i ($1 \le c_i, d_i \le N$), which represent that there is an undirected edge connecting vertices c_i and d_i of G'. You can assume that both G and G' are connected graphs and do not contain self-loops and double edges.

Output

Print "`Yes`" if G and G' are isomorphic. Print "`No`", otherwise.

Examples

standard input	standard output
4 1 2 2 3 2 4 3 4 1 2 1 3 1 4 3 4	Yes
4 1 2 2 3 3 4 1 4 1 2 1 3 1 4 3 4	No
6 1 2 1 3 2 5 2 6 3 5 4 6 1 5 1 6 2 4 2 5 2 6 3 4	Yes