Problem E. Tree Transform

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

MianKing has two labeled unrooted trees S,T with n nodes and he wants to transform S to T by some operations.

In each operation, MianKing can select four distinct nodes x, y, z, w which forms a path $\{(x, y), (y, z), (z, w)\}$ in the tree S. Then he removes edges $\{(x, y), (y, z), (z, w)\}$ from S , chooses three new edges whose endpoints $\in \{x, y, z, w\}$ and adds these new edges to S. MianKing has to guarantee that S is still a tree after this operation.

Now you need to help MianKing to transform S to T within 10^4 operations.

Input

The first line has one integer n.

Then there are $n - 1$ lines, each lines has two integers (x, y) which denotes an edge in S.

Then there are $n - 1$ lines, each lines has two integers (x, y) which denotes an edge in T.

$4 \leq n \leq 100$

It's guaranteed that S and T are both trees.

Output

The first line has one string "YES"if there exists a solution to transform S to T within 10^4 operations, otherwise "NO". (both without quotation)

If there exists a solution, then:

The first line has one integers m which denotes the number of operations of your solution.

Then for each operations, there are two lines which represent this operations. The first line has four integers (x, y, z, w) and the second line has six integers $a_1, b_1, a_2, b_2, a_3, b_3$ which (a_i, b_i) denotes the i-th new edge you choose in this operation.

For each operation, you should guarantee these conditions:

1. $1 \leq x, y, z, w, a_i, b_i \leq n$

2. x, y, z, w are distinct and form a path $\{(x, y), (y, z), (z, w)\}$ in the tree S at that time.

3. $a_i, b_i \in \{x, y, z, w\}$

4. After removing edges $\{(x, y), (y, z), (z, w)\}$ and add new edges $(a_1, b_1), (a_2, b_2), (a_3, b_3)$, S is still a tree at that time.

5. After all of the operations, S should be the same as T.

6. $0 \leq m \leq 10^4$

Two labeled tree are same if and only if $[(x, y) \in S] \leftrightarrow [(x, y) \in T]$ for all edge (x, y)

Examples

standard input	standard output
5 1 2 2 3 3 4 2 5 1 2 2 3 3 4 1 5	YES 2 5 2 3 4 2 3 3 5 3 4 1 2 3 5 1 5 1 2 2 3
4 1 2 1 3 1 4 1 2 2 3 3 4	NO
4 1 2 1 3 1 4 1 2 1 3 1 4	YES 0