Problem H. Mex on DAG

Input file:	*standard input*
Output file:	*standard output*
Time limit:	5 seconds
Memory limit:	256 mebibytes

You are given a directed acyclic graph consisting of n vertices and $2n$ edges. Each edge contains a single integer: more precisely, i-th edge contains the integer $\lfloor \frac{i}{2} \rfloor$. Edges are numbered from 0 to $2n-1$. You need to find a simple path in this graph such that the value of the *mex* function of edges along this path is maximum possible.

We define the value of *mex* of a set of non-negative integers as the smallest non-negative integer which doesn't belong to this set. For example: $mex(0, 1, 3) = 2$.

Input

The first line contains a single integer n ($2 \le n \le 2000$), the number of vertices.

The next $2n$ lines contain description of the edges, from edge number 0 to edge number $2n - 1$. The line corresponding to the i-th edge specifies its endpoints: two integers a_i and b_i ($1 \le a_i < b_i \le n$). Recall that the i-th edge contains the integer $\lfloor \frac{i}{2} \rfloor$.

Output

Print a single integer: the largest value of the *mex* function along some simple path in this graph.

Examples

standard input	standard output
8 3 6 2 7 1 3 2 3 6 7 7 8 7 8 4 6 2 7 1 5 2 5 2 8 6 8 7 8 3 5 7 8	4
15 7 15 10 12 13 14 6 8 14 15 9 10 6 13 1 8 6 8 8 9 14 15 13 14 9 13 7 13 14 15 12 14 6 7 3 14 11 14 3 10 10 12 3 8 8 14 13 14 9 11 10 13 6 10 5 10 1 11 13 14	3