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## Problem A. 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  $n$  ( $2 \leq n \leq 2000$ ), 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  $b_i$  ( $1 \leq a_i < b_i \leq n$ ). 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.

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## Examples

| standard input   | standard output |
|--|-----------------|
| 8<br>3 6<br>2 7<br>1 3<br>2 3<br>6 7<br>7 8<br>7 8<br>4 6<br>2 7<br>1 5<br>2 5<br>2 8<br>6 8<br>7 8<br>3 5<br>7 8  | 4               |
| 15<br>7 15<br>10 12<br>13 14<br>6 8<br>14 15<br>9 10<br>6 13<br>1 8<br>6 8<br>8 9<br>14 15<br>13 14<br>9 13<br>7 13<br>14 15<br>12 14<br>6 7<br>3 14<br>11 14<br>3 10<br>10 12<br>3 8<br>8 14<br>13 14<br>9 11<br>10 13<br>6 10<br>5 10<br>1 11<br>13 14 | 3               |