Time Limit: 4 s | Memory Limit: 1 MB

Marshaling

In CODE BLUE Kingdom, the king is going to hold some splendid party in order to celebrate the 100 th anniversary of its founding. As an entertainment in the party, the king is planning to march the army in a line through the castle, but there is one problem.

The army of CODE BLUE is very well known for its rigorous class system. In the system, it is prescribed that no one should precede other person who has a higher rank, "**if their ranks can be comparable**"(the ranks of two persons are not necessarily comparable). Due to this regulation, forming a line of the march requires careful attention, otherwise some soldiers may violate the regulation!

Your task is to help the king sort soldiers, by answering the following type of question:

"Should soldier x come before soldier y?"

Input

The first line of input contains two integers: N (the number of soldiers), M (the number of pairs of the two persons whose ranks are comparable).

Each of the following M lines contains two integers a, b $(0 \leq a, b \leq N-1, a \neq b)$ – describing solder a must precede soldier b.

After $M+1$ lines, there will be lines which represent questions. Each of the lines contains two integers x, y $(0 \leq x, y \leq N-1, x \neq y)$ – describing "Should soldier x come before soldier y?"

The end of input is represented as EOF.

Output

For each question, output "-1"(without quotes) if the answer of the question is yes, and "1"(without quotes) if not.

It is guaranteed that there exists at least one order that satisfies all of the regulations given in the input.

Constraints

$1 \leq N \leq 8000, 0 \leq M \leq 8000$

Explanation of Sample 1

The possible orders in the first example are the following:

1 4 0 2 3
4 1 0 2 3
4 0 1 2 3
4 0 2 1 3

The sample output answers questions so that the consequent line should be 1 4 0 2 3.

Sample Input 1	Sample Output 1
5 4 4 0 0 2 1 3 2 3 0 1 1 0 4 2 2 1 3 0	1 -1 -1 1 1