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Harry Potter and the Railroad

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Harry Potter and the Railroad

2.0/2.0 points (graded)

Input file:	railroad.in
Output file:	railroad.out
Time limit:	2 seconds
Memory limit:	256 megabytes

After becoming the head of Aurors, Harry Potter decided to protect railroads from evil magic.

In the Wizarding World, there are N railroad stations and M roads which connect these stations. Every road connects two different stations, however, two different stations may be connected by more than one road. It is possible to traverse each road in both directions. It is also known that there exists a path, consisting of these roads, between two arbitrary stations.

Harry prepared M new protective spells, numbered by integers from 1 to M . Every spell can be put on a certain railroad. Harry cannot use one spell to protect more than road, and he also cannot put two or more spells on a single road.

Harry wants that, apart from roads, these spells protect stations as well. A station is protected, if the greatest common divisor of the numbers of spells, which protect the adjacent roads, is equal to 1.

Help Harry to protect all the railroads, such that all railroad stations are also protected.

Input

The first line of the input file contains two integer numbers N and M ($2 \leq N \leq 50\,000$, $N - 1 \leq M \leq 150\,000$) - the number of stations and the number of roads, correspondingly.

Each of the following M lines contain descriptions of the roads. Every description consists of two numbers, a_i and b_i ($1 \leq a_i, b_i \leq n, a_i \neq b_i$), the numbers of stations connected by this road.

Output

Print "IMPOSSIBLE" if it is impossible to protect all the roads, such that every station is also protected.

Otherwise, print M numbers, one per line. The i -th line should contain the number of spell which protects the railroad described in the $(i + 1)$ -th line of the input file.

Example

railroad.in	railroad.out
5 6	1
1 2	2
2 3	3
1 3	4
1 4	5
4 5	6
1 5	

No file chosen

Accepted

You have used 4 of 200 attempts

Discussion

Topic: 08: 4th Week Problems / Harry Potter and the Railroad



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