Problem L: Lucky Hans

Time limit: 2 seconds

HANS had served his master for seven years, and as reward, Hans received a piece of gold as big as his head. On his way home, Hans met a lot of people offering him to trade. Being a miserable merchant, Hans eventually ended up with some object of significantly smaller value than the piece of gold.

Hans accepting one bad trade after the other.
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More precisely, the situation could be described as follows: there were n objects of different value. The piece of gold initially owned by Hans was the most valuable of these objects. Also, there were m trade offers available to Hans. A trade offer was a pair (x, y) of objects meaning that Hans could exchange object x for object y. Since the other person involved in the trade was less naive than Hans, the value of y was always less than the value of x.

When Hans owned object x and there was at least one trade offer available for x, then Hans luckily accepted such an offer to get rid of x. However, Hans did not pick an arbitrary offer. Out of all available trade offers (x, y), he picked the one where y was the most valuable. Hans performed this until there were no trade offers available anymore.

By the time the Grimm brothers were writing down Hans' story, it was long forgotten how valuable the different objects were back then. The only thing still known for sure was that the piece of gold was the most valuable object, and that for every trade offer (x, y), the object y was less valuable than object x. While the trade offers available to Hans were still known, it was unknown which trade offers he had accepted. Also, it was unknown which object Hans owned in the end when no trade offer had been available anymore. The Grimm brothers only knew that this object was the kth least valuable.

Help the Grimm brothers by figuring out how valuable the objects could have been back in Hans' days such that Hans could have ended up with the kth least valuable object or determine that the information gathered by the Grimm brothers is contradictory.

Input

The input consists of:

- One line with three integers n, m, and k ($2 \leq n \leq 3000$, $1 \leq m \leq 9000$, $1 \leq k \leq n$), the number of objects, the number of trade offers and the relative value of the object Hans ends up with.
- m lines with two integers x and y ($1 \leq x, y \leq n$, $x \neq y$), each describing a trade offer: object x can be traded for object y.

It is guaranteed that the trade offers are distinct and acyclic. The piece of gold is the object with number 1 and it is guaranteed that every object can be obtained when starting with the piece of gold.

Output

If Hans could not have ended up with the kth least valuable object, output "`impossible`". Otherwise, output a permutation $v_1, \ldots, v_n$ meaning that object i was the v_ith least valuable.

If there are multiple valid solutions, you may output any one of them.

Sample Input 1

```
4 3 2
1 2
1 3
3 4
```

Sample Output 1

```
4 1 3 2
```

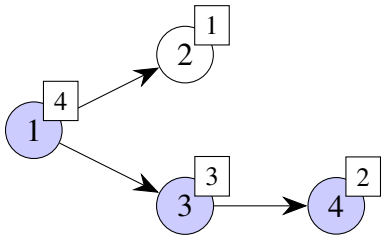
Sample Input 2

```
4 4 2
1 2
2 3
2 4
4 3
```

Sample Output 2

```
impossible
```

Consider the first sample input with the object values given in the sample output. In the following illustration, the objects owned by Hans during the trading process are marked in blue:



Initially, Hans owns the object labelled 1, i.e., the large piece of gold. He is offered to trade it for object 2 or object 3. He trades it for object 3 since this object is more valuable. After this, he is offered to trade object 3 for object 4. Since there are no other available trade offers, he accepts this one. When he owns object 4, he does not receive any trade offer for it. Thus, Hans ends up with object 4 which is the second least valuable.