TASK 5: RANK

In a new sports discipline called Triball proposed for the Youth Olympic Games in Singapore, a set of k players $\{1, 2, \ldots, k\}$ are involved (where $k < 1000$). In every match, 3 players are selected and the result of the match is either 1 winner or 1 loser. Given the result of n matches (where $n < 10000$), our task is to give a ranking list of the players.

Precisely, the i^{th} match involves three distinct players $p_{i1}, p_{i2}, p_{i3} \in \{1, 2, \ldots, k\}$. The result of the i^{th} match is represented by $p_{i1} > p_{i2}, p_{i3}$ (or $p_{i2}, p_{i3} > p_{i1}$) where p_{i1} is the winner (or loser) of the match. The result $p_{i1} > p_{i2}, p_{i3}$ implies that p_{i1} is better than p_{i2} and that p_{i1} is better than p_{i3}. Similarly, the result $p_{i2}, p_{i3} > p_{i1}$ implies that p_{i2} is better than p_{i1} and that p_{i3} is better than p_{i1}. Our aim is to find the permutation of the k players so that a better player always comes before his opponent, considering all given matches. If we cannot reach our aim and such a permutation does not exist, we output 0.

Example 1

Consider 6 players $\{1, 2, 3, 4, 5, 6\}$. Suppose the results of 5 matches are: (1) $4 > 1, 3$, (2) $3 > 1, 2$, (3) $2, 5 > 6$, (4) $5 > 2, 3$, and (5) $1 > 2, 6$. Then, a valid ranking of the players is $4 > 5 > 3 > 1 > 2 > 6$.

Example 2

Consider 4 players $\{1, 2, 3, 4\}$. Suppose the results of 2 matches are: (1) $1 > 2, 4$ and (2) $2, 4 > 1$. Then, there is no valid ranking of the players.

Input File: `RANK.IN`

The input file `RANK.IN` is as follows. The first line contains two integers k and n separated by a space character, where $1 \leq k \leq 1000, 1 \leq n \leq 10000$. The number k is the number of players, denoted by numbers from 1 to k. The remaining n lines contain n results in the form of either $p_{i1} > p_{i2}, p_{i3}$ or $p_{i2}, p_{i3} > p_{i1}$.

For Example 1, the input file looks like this:

```
6 5
4>1,3
3>1,2
2,5>6
5>2,3
1>2,6
```

For Example 2, the input file looks like this:

```
4 2
1>2,4
2,4>1
```

Output File: RANK.OUT

If there is a valid ranking of the players, the output file RANK.OUT contains k integers, separated by a space character, representing the ordering of the players. Otherwise, the output file RANK.OUT contains one integer 0. For Example 1, the output file looks like this:

```
4 5 3 1 2 6
```

For Example 2, the output file looks like this:

```
0
```