Problem I. Infection

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	64 megabytes

An emergency happened in one secret organization. In the middle of the working day, one of the employees was hospitalized with symptoms of an extremely dangerous *colonavirus* infection. In this regard, the management of the organization wants to establish which employees can still be infected, but the symptoms of the disease have not yet shown themselves.

There are n employees in the organization, who can be numbered with integers from 1 to n. From the recordings of CCTV cameras, the organization's management established when which employees contacted each other. In addition, management took into account the following assumptions:

- At the beginning of the working day, exactly one of the employees was infected, and each of the initial states could happen with a probability of $1/n$.
- If two employees come into contact with each other, and one of them is infected and the other is not, then a healthy employee becomes infected with a probability of $1/2$. If both employees are healthy, or both are infected, nothing happens.
- If an employee is infected, he cannot suddenly recover, that is, he remains infected until the end.
- It is known that the employee numbered k was eventually infected.

A chronological list of employees' contacts is given. Determine for each employee the probability of being infected according to the assumptions described above.

Input

The first line contains three integers n, k and m — the number of employees, the number of the infected employee and the number of contacts, respectively ($2 \le n \le 15$, $1 \le k \le n$, $1 \le m \le 50$).

The i-th of the following m lines contains two integers x_i and y_i — indexes of employees who participated in the i-th contact ($1 \le x_i, y_i \le n$, $x_i \ne y_i$).

All contacts in the list are given in chronological order

Output

Print n lines. On the i-th line print the probability of infection of the i-th employee as an irreducible fraction a/b. See the example for a more precise understanding.

Examples

standard input	standard output
3 2 1 1 2	2/3 1/1 0/1
3 2 2 1 2 2 3	1/2 1/1 5/8
4 1 4 1 2 2 3 3 4 4 1	1/1 19/37 17/37 27/37