Task: PRZ
Kindergarten

Olimpiada Informatyczna

XXVII OI, Stage I. Source file `prz.*` Available memory: 256 MB. *21.10 – 18.11.2019*

Each morning the kindergarten teacher hands out toys to the children. To keep everything in order, each of the n children receives exactly one toy. Each child may either play on their own or in pair together with another child, but only if the two like each other.

The teacher has k kinds of toys. She is wondering how many different ways there are to distribute the toys among the children in such a way that every two children who like each other receive different kinds (so that they have two kinds to play with should they form a pair).

Input

In the first input line, there is a triplet of integers n, m, z ($1 \leq n \leq 100\,000$, $0 \leq m \leq \min(100\,000, n(n-1)/2)$, $1 \leq z \leq 1000$), separated by single spaces, which respectively specify: the number of children in the kindergarten, the number of pairs of children who like each other, and the number of queries.

The m lines that follow specify the pairs of children who like each other: each such line contains two positive integers a_i and b_i which are the numbers of the two children who like each other. For simplicity, we number children from 1 to n. No pair appears more than once on input.

Finally, the last z lines contain the queries: the i-th of these contains an integer k_i ($1 \leq k_i \leq 10^9$).

Output

Exactly z lines should be printed to output: the i-th of these should contain the number of ways the toys can be distributed among the children if there are k_i kinds. The numbers should be reported modulo $10^9 + 7$ (i.e., the remainder of division of the actual number by $10^9 + 7$ should be printed).

Example

For the input data:

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

the correct result is:

```
12
```

Grading

The set of tests consists of the following subsets. Within each subset, there may be several tests. Within each subset, at least 50% of the score is awarded for tests in which $z = 1$.

Subset	Condition	Score
1	$n \leq 8$, $k \leq 8$, $z \leq 50$	8
2	$n \leq 15$	26
3	$m \leq 24$	33
4	each child likes exactly two other children	33

Sample grading tests:

`1ocen`: $n = 5$, $m = 10$ (all children like each other), two queries for $k \in \{5, 6\}$;

`2ocen`: $n = 11$, $m = 40$, query for $k = 15$;

`3ocen`: $n = 100$, $m = 15$, five queries for random $k \in [10, 100]$;

`4ocen`: $n = 100$, $m = 100$, the pairs of children who like each other are no. i and $i + 1$ for $1 \leq i < 100$ as well as no. 100 and 1; three queries for $k \in \{5, 10, 15\}$.