Problem F. Frank

Input file: `standard input`
Output file: `standard output`

Frank likes to travel. However, he doesn't prefer a fully-planned trip. Instead, he enjoys traveling from one city to another randomly.

Frank's favorite country is Country Meow because the roads in the country are complicated.

Country Meow has N cities, indexed with numbers from 0 to $N-1$, and there are M unidirectional roads. The i-th road can be denoted by (a_i, b_i), which means it starts from city a_i and ends in city b_i, and does not pass through any other cities. Interestingly, there may be roads with $a_i = b_i$, or several roads with the same starting and ending cities. The roads are built in a way such that for any two cities A and B, one can travel from A to B through these roads.

Frank is planning Q trips to Country Meow. Each plan is an ordered list of cities $C = (c_0, c_1, \cdots, c_{K-1})$ such that $c_i \neq c_{i+1}$ for all $0 \leq i \leq K-2$.

On a trip with a plan C, Frank will:

1. Go to city c_0.
2. Choose a road uniformly at random from all roads whose starting city is Frank's current city.
3. Follow the chosen road to the next city.
4. If C is a subsequence of the current visited cities sequence, then the trip is finished. Otherwise, go to step 2.

(A sequence A is a subsequence of another sequence B if one can delete some or no elements from B without changing the order and obtain A.)

However, each road requires a toll of 1 dollar. Frank wants to know the expected value of the total amount of fees he spent on each trip. Can you help him?

Input

The first line contains three positive integers N, M, Q ($3 \leq N \leq 400, M \leq 4 \times 10^5, Q \leq 400$).

The following M lines describe the roads in the Country Meow. Each of them contains two integers a_i, b_i ($0 \leq a_i, b_i < N$) — the starting and ending cities of the i-th road.

The following $2Q$ lines describe the plans Frank made. Each two lines describe a plan. The first contains an integer K ($2 \leq K \leq 500$) — the length of the city list; the second contains K integers $c_0, c_1, \cdots, c_{K-1}$ ($0 \leq c_i < N, c_i \neq c_{i+1}$) — the city list in the plan.

Output

For each plan, print a single real number in one line — the expected value of the total amount of fees on the corresponding trip.

Your answer is considered correct if the absolute or relative error between each number in your output and the corresponding one in jury's answer does not exceed 10^{-8}. Formally, let your answer be a, and the jury's answer be b. Your answer is considered correct if $\frac{|a-b|}{\max(1,|b|)} \leq 10^{-8}$.

It is guaranteed that for any plan, the answer is less than 10^7.

Example

standard input	standard output
3 4 3 0 1 1 2 2 0 2 1 2 1 0 4 0 2 0 1 3 2 1 2	4.00000000 6.00000000 2.50000000