

The Continuing Corgi Conundrum

Filename: corgi

Charles, the Corgi-obsessed programmer, is back! He once again visits a pond with exactly n dogs in a nearby field, all of which are Corgis. He wishes to take home exactly k distinct Corgis, and as he is not partial to any particular doggo, he selects k initial dogs at random. However, we all know that Corgis are amazingly energetic and friendly creatures who share inseparable bonds with others of their kind. Thus, upon choosing an initial Corgi, Charles also has to take its friends, and then its friends' friends, and so on...

Now given the friendships that all of the Corgis share, Charles wishes to know what the expected number of Corgis that he will take home is if he chooses k distinct initial Corgis at random.

The Problem:

Given n Corgis, m friendship bonds between them, and a positive integer, k , determine the number of Corgis that Charles can expect to take home, if he picks k distinct initial Corgis at random.

The Input:

The first line contains a single, positive integer, s , which is the number of distinct scenarios to consider. For each scenario, the first line contains three integers, n , m and k ($1 \leq n \leq 1,000$; $0 \leq m \leq 1,000$; $1 \leq k \leq n$), representing the number of Corgis that exist in the pond, the number of friendship bonds, and the number of Corgis Charles chooses initially, respectively. The following m lines of the scenario will contain friendship bonds, if any, and consist of two integers, u and v ($1 \leq u \leq n$; $1 \leq v \leq n$), meaning that Corgi number u and Corgi number v are friends.

The Output:

For each scenario, output "Pond # i : x " where i is the number of the pond (in the order of the input, starting with 1) and x is the expected number of Corgis that Charles can expect to take with him for this pond to 3 decimal places and rounded. For example, 12.1713 rounds to 12.171, 12.1715 rounds to 12.172, and 12.1718 rounds to 12.172.

(Sample Input and Sample Output follow on next page)

Sample Input:

```
2
5 2 2
1 2
3 4
7 5 3
1 2
3 4
1 3
5 6
7 5
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Sample Output:

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Pond #1: 3.200
Pond #2: 6.543
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