The cask of amontillado

P31675_en

Sisè Concurs de Programació de la UPC - Final (2008-10-01)

> *The thousand injuries of Fortunato I had borne as I best could; but when he ventured upon insult, I vowed revenge... We continued our route in search of the amontillado. We passed through a range of low arches, descended, passed on, and descending again, arrived at a deep crypt... I forced the last stone into its position; I plastered it up... In pace requiescat!*

With the excuse of sampling a cask of amontillado, Montressor has guided poor drunken Fortunato through the catacombs under Montressor's palace. There, in a very remote crypt, Montressor has immured Fortunato inside a hidden niche. Now Montressor wants to return to the chamber where they started their route, but he has forgotten the way to get there. Fortunat*o*ly, Montressor has a map of the catacombs, which shows all the chambers and their direct connections. (Note that some steps are so difficult that it may be possible to pass from one chamber u to another v, but not directly back from v to u.) The map also shows which chambers contain amontillado.

Montressor and Fortunato went from a starting chamber x to another chamber y where they are now. Ironically, Montressor knows that there is no path from x to any chamber with amontillado. Montressor also knows that it is possible to go from y back to x. However, he cannot identify which is x nor which is y in the map. Please help him by computing the number of possible combinations for x and y that are consistent with all this information.

Input

Input consists of several cases. Each one begins with the number of chambers n, a number c, and c different chambers that contain amontillado. Follows a number m, and m different pairs u v (with $u \neq v$) denoting that there is a direct connection from u to v. Assume $0 \leq n \leq 10000$, $0 \leq c \leq n$, and $0 \leq m \leq 10n$. The chambers are numbered from 0 to $n-1$.

Output

For every case, print its number, followed by the number of combinations for x and y that are consistent with Montressor's knowledge.

Sample input

```
5 1  2
6    0 3  3 0  2 3  1 2  1 4  4 1
8 0
7    1 3  0 3  0 1  5 0  3 0  7 6  0 4
```

Sample output

```
Case #1: 2
Case #2: 6
```

Problem information

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