

Chess Championship Distant Sites

The International Chess Championship organizing committee has decided that the site for the Championship has to be chosen in such way that its distance from the capital city of the country is maximized. The reason is obvious, the committee wants to isolate the competitors and the visitors from the temptations of the capital so that they all stay as long as possible on the Championship site.

The site should consist of three towns each of which is connected to directly the other one by a road. The distance between two towns A and B is the minimum number of pairs of directly connected towns on the way from A to B. Two towns are connected directly by a road R if there is no other town on R between A and B. The distance of any possible site from the capital city is equal to the sum of the distances from each of the three towns representing the site from the capital city.

To get better understanding of the task you might also want to read the previous problem (Chess Championship Sites) related to the Championship committee decisions.

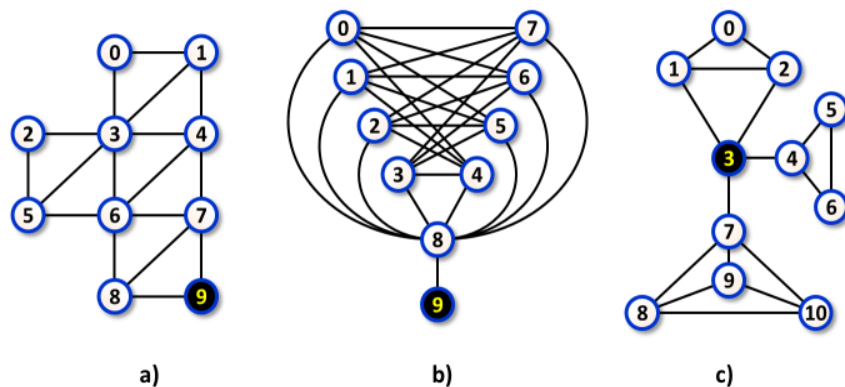


Image 1. Town connection schemes depicting input data in Examples below. The capital cities are highlighted. In case a), there are two most distant sites from the capital in node 9, the sites are $\{0, 1, 3\}$ and $\{2, 3, 5\}$ and their distance from the capital is 10. In case b), there are 16 possible sites in the whole country and all share the same distance 5 from the capital in node 9. In case c), there is only one most distant site from the capital in node 3, the site is $\{8, 9, 10\}$ and its distance from the capital is 6.

The task

You are given the scheme of road connections between the towns in the country. Find all championship sites which distance from the capital city is maximum possible.

Input

The first input line contains three integers N , M , C separated by space. The values indicate (in this order) the number of towns in the country, the number of pairs of neighbour towns and the label of the capital city. The towns are labeled by integers $0, 1, \dots, N-1$. Next, there are M text lines, each describe one pair of neighbour towns. The line contains the labels of the towns separated by space. The order of towns in the pair and the order of pairs of towns in the input is arbitrary. It holds, $1 \leq N \leq 5000$, $1 \leq M \leq 40\,000$.

You may assume that each town in the country is connected to the capital city by at least one sequence of roads.

Output

The output contains one text line with two integers D and S separated by space. D is equal to the maximum possible distance of a championship site from the capital city, S is the number of all sites which are located at distance D from the capital city.

Example 1

Input

10 17 9
0 1
0 3
1 3
1 4
2 3
3 4
2 5
3 5
3 6
4 6
4 7
5 6
6 7
6 8
7 8
7 9
8 9

Output

10 2

The data of Example 1
are depicted in Image 1a).

Example 2

Input

10 25 9
0 7
0 6
0 5
0 4
1 7
1 6
1 5
1 4
2 7
2 6
2 5
2 4
3 7
3 6
3 5
3 4
0 8
1 8
2 8
3 8
4 8
5 8
6 8
7 8
9 8

Output

5 16

The data of Example 2
are depicted in Image 1b).

Example 3

Input

11 16 3
0 1
0 2
1 2
1 3
2 3
3 4
4 5
5 6
4 6
3 7
7 8
7 9
7 10
8 9
8 10
9 10

Output

6 1

The data of Example 3
are depicted in Image 1c).

Public data

The public data set is intended for easier debugging and approximate program correctness checking. The data are stored in the file datapub.zip attached to this problem.