Earthquakes

Time Limit: 1 Second
Memory Limit: 256 MB

As the governor of the state of Sionilli, LetianPie is getting worried recently because there have been too many earthquakes happening in the state. Fortunately, the earthquakes only happen between cities so they don't cause much damage, but the roads are getting destroyed in the earthquakes and require reconstruction. Since road construction costs a lot of money, LetianPie wants to know how many roads need to be reconstructed after each earthquake so that the state remains connected. Since he is very busy, he asks you to write a program to compute the result for him.

The state of Sionilli can be viewed as an undirected graph with n ($1 \leq n \leq 10^5$) vertices and m ($1 \leq m \leq \min(10^5, \frac{n(n-1)}{2})$) edges. It is guaranteed that there are no self-loops or multiple edges in the graph. The i-th earthquake will destroy the edge (u_i, v_i). It is guaranteed that the edge exists and is not destroyed before the event. After each earthquake, output the number of vertices reachable from the capital city (vertex 1) and the number of connected components after the road is destroyed.

Input

The first line of input contains three integers n, m, k ($2 \leq n \leq 10^5$, $1 \leq m \leq \min(10^5, \frac{n(n-1)}{2})$, $1 \leq k \leq n$) - the number of vertices, edges, and earthquakes.

Following m lines describe the roads. The i-th line contains two integers u_i and v_i ($1 \leq u_i, v_i \leq n$), denoting there is an undirected edge between u_i and v_i. It is guaranteed that there are no self-loops or multiple edges in the graph.

Following k lines describe the roads destroyed by the earthquakes. The i-th line contains two integers u_i and v_i ($1 \leq u_i, v_i \leq n$), denoting the edge between u_i and v_i is destroyed in the i-th earthquake. It is guaranteed that the edge exists and is not destroyed before the event.

Output

For each earthquake, output two integers denoting the number of vertices reachable from the capital city and the number of connected components after the earthquake.

Sample Inputs

```
5 6 3
1 2
1 3
1 4
1 5
2 4
3 5
2 4
1 2
1 4
```

Sample Outputs

```
5 1
4 2
3 3
```