You want to copy graph G to a new graph H in the following order. Initially, H does not have any vertex or edge.

1. Select a vertex v that is in G but not in H yet
2. Add vertex v into H
3. For every edge incident to v in G, if both end points appears in H, add this edge into H
4. Repeat steps 1 - 3 until all vertices and edges are copied into H

You have decided the order of vertices you will select in step 1. After adding each vertex and corresponding edges (step 2 - 3), calculate the number of connected components in graph H and the size of the largest connected component in graph H.

Recall that:

- A *simple graph* contains no multiple edge and no self-loop
- A *connected component* of an undirected graph is a *connected* subgraph that is not part of any larger *connected* subgraph.
- An isolated vertex which can not reached by any other vertices should be considered as one *connected component*.

Input

The first line of the input contains two integers n and m — the number of vertices and the number of edges in graph G. The vertices are denoted by $1, 2, ..., n$.

Then m lines follow, each line contains two integers u and v, being an edge in graph G.

The last line contains a permutation of integers 1 to n, being the order of vertices that will be added to graph H in step 1.

Constraints

- $2 \leq n \leq 10^5$
- $1 \leq m \leq min(\frac{n(n-1)}{2}, 2 \times 10^5)$

Output

After adding a vertex and its corresponding edges, print the answers in one line.

Sample Input 1

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

Sample Output 1

```
1 1
1 2
1 3
```

Submissions

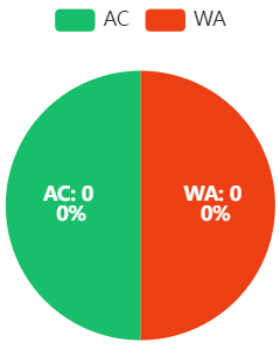
Rankings

View Contest

Information

ID	2
Time Limit	1000MS
Memory Limit	256MB
IO Mode	Standard IO
Created By	ta_redleaf
Level	Hidden
Score	100
Tags	Show

Statistic Details



Detailed Constraints

For test ID 1 (5% of total points):

- Identical to sample IO

For test ID 2 - 7 (65% of total points):

- $n \leq 2500$

For test ID 8 - 10 (30% of total points)

- No additional constraints

Language: C

Theme: Solarized Light

```
1
```

Submit for Sample Test Submit

Sample Test Input

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

Sample Test Output