

Contest Duration: 2025-06-21(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250621T2100&p1=248>) - 2025-06-21(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250621T2240&p1=248>) (local time) (100 minutes)

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F - Contraction

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Time Limit: 4 sec / Memory Limit: 1024 MiB

Score : 525 points

Problem Statement

You are given an undirected graph G_0 with N vertices and M edges. The vertices and edges of G_0 are numbered as vertices $1, 2, \dots, N$ and edges $1, 2, \dots, M$, respectively, and edge i ($1 \leq i \leq M$) connects vertices U_i and V_i .

Takahashi has a graph G and N pieces numbered as pieces $1, 2, \dots, N$.

Initially, $G = G_0$, and piece i ($1 \leq i \leq N$) is placed on vertex i of G .

He will now perform Q operations in order. The i -th operation ($1 \leq i \leq Q$) gives an integer X_i between 1 and M , inclusive, and performs the following operation:

In G , if pieces U_{X_i} and V_{X_i} are placed on different vertices and there exists an edge e (on G) between them, create a graph G' by contracting that edge. In this case, if self-loops are created, remove them, and if multi-edges exist, replace them with simple edges.

Then, all pieces that were placed on the two vertices connected by edge e in G are placed on the newly generated vertex by the contraction of e in G' . Pieces that were placed on other vertices in G are placed on the corresponding vertices in G' . Finally, set this resulting G' as the new G .

If pieces U_{X_i} and V_{X_i} are placed on the same vertex, or if the vertices they are connected by an edge, do nothing.

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For each of the operations $i = 1, 2, \dots, Q$, output the number of edges in G after the i -th operation.

► Edge Contraction

Constraints

- $2 \leq N \leq 3 \times 10^5$
- $1 \leq M \leq 3 \times 10^5$
- $1 \leq U_i < V_i \leq N$
- $(U_i, V_i) \neq (U_j, V_j)$ if $i \neq j$.
- $1 \leq Q \leq 3 \times 10^5$
- $1 \leq X_i \leq M$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
N  M
U1  V1
U2  V2
:
UM  VM
Q
X1  X2  ...  XQ
```

Output

Output Q lines. On the i -th line ($1 \leq i \leq Q$), output the number of edges in G after the i -th operation.

Sample Input 1

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

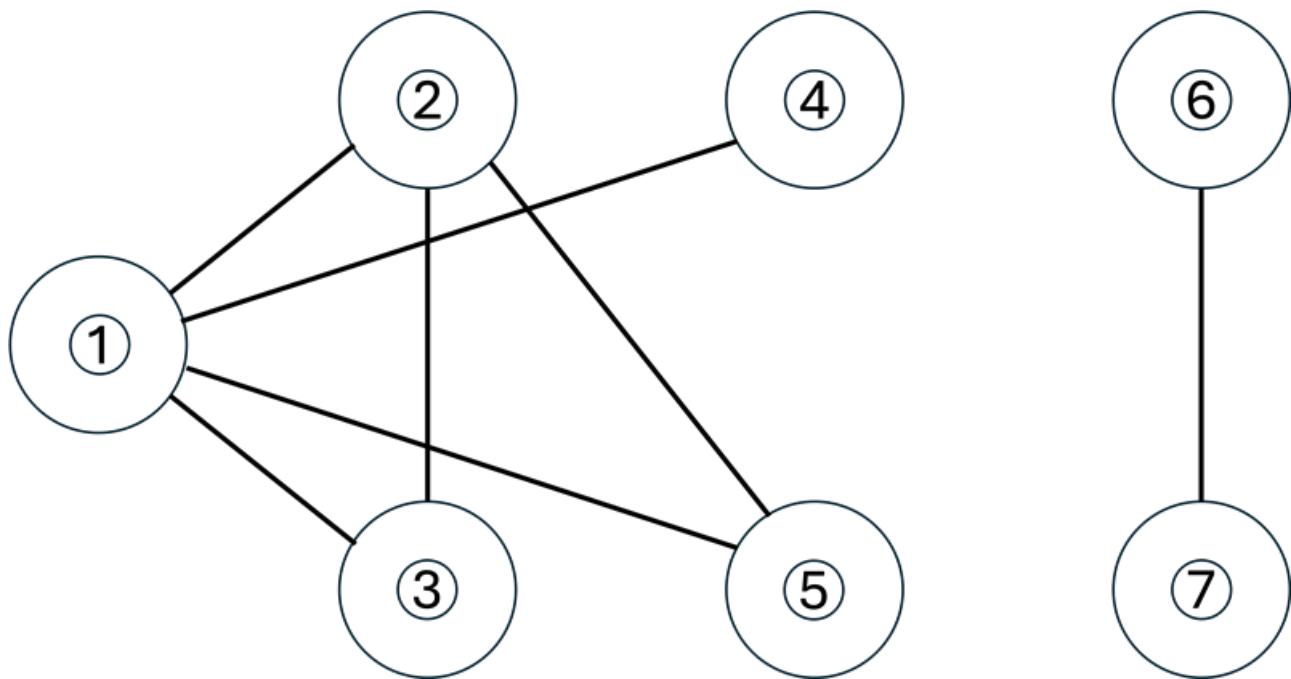
Sample Output 1

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```
4
3
3
3
2
```

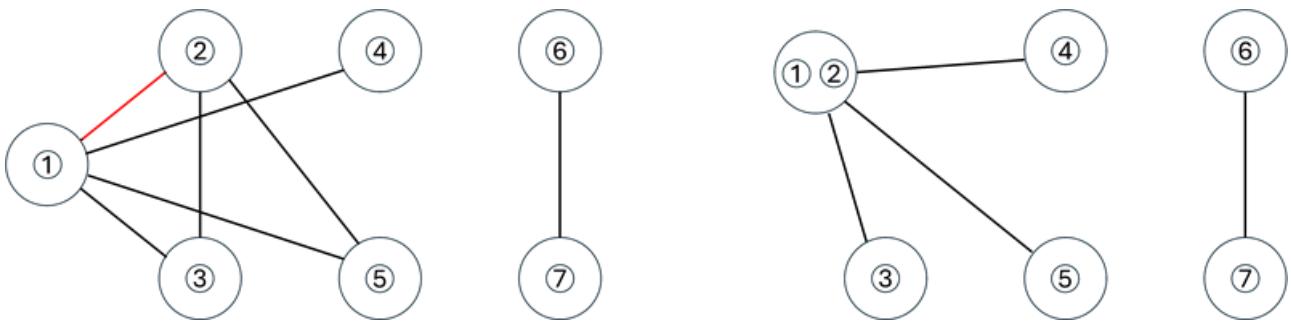
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Initially, G is as shown in the figure below. The circled numbers represent pieces with those numbers.



In the 1st operation, we contract the edge between the vertices where pieces 1 and 2 are placed (left figure below).

After the operation, G becomes as shown in the right figure below, and in particular, the number of edges is 4. Note that self-loops have been removed and multi-edges have been replaced with simple edges.



In the 2nd operation, we contract the edge between the vertices where pieces 1 and 3 are placed.

After the operation, G becomes as shown in the left figure below, and the number of edges becomes 3.

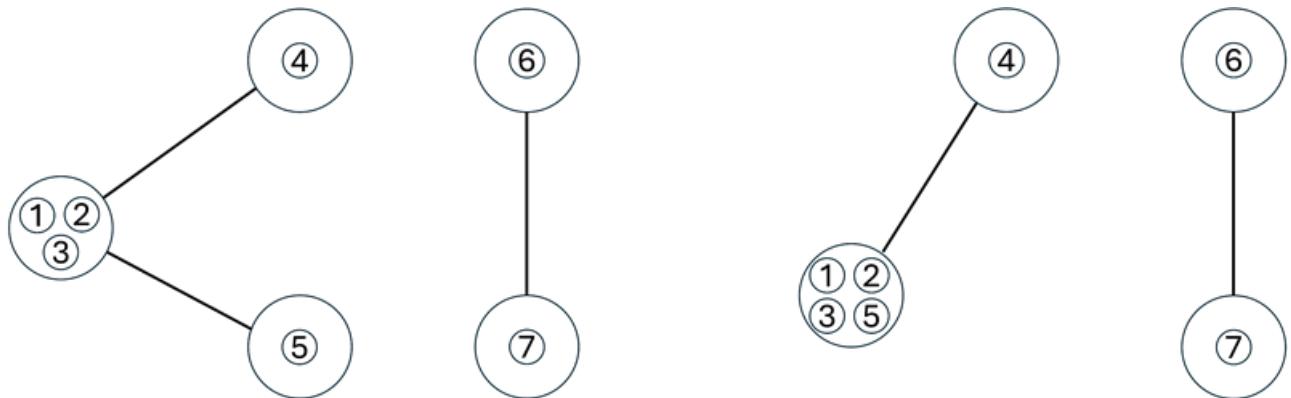
In the 3rd operation, since pieces 2 and 3 are placed on the same vertex, G remains unchanged, and the number of edges remains 3.

In the 4th operation as well, since pieces 1 and 2 are placed on the same vertex, G remains unchanged, and the number of edges remains 3.

In the 5th operation, we contract the edge between the vertices where pieces 1 and 5 are placed.

After the operation, G becomes as shown in the right figure below, and the number of edges becomes 2.

Thus, output 4, 3, 3, 3, 2 in this order, separated by newlines.



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