C - Dislike Foods

Editorial (/contests/abc402/tasks/abc402_c/editorial)

Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 300 points

Problem Statement

The AtCoder Restaurant uses N types of ingredients numbered from 1 to N.

The restaurant offers M dishes numbered from 1 to M. Dish i uses K_i types of ingredients, namely $A_{i,1}, A_{i,2}, \ldots, A_{i,K_i}$.

Snuke currently dislikes all N ingredients. He cannot eat any dish that uses one or more ingredients he dislikes, and he can eat a dish that uses none of the disliked ingredients.

Over the next N days, he will overcome his dislikes one ingredient per day. On day i, he overcomes ingredient B_i, and from then on he no longer dislikes it.

For each $i = 1, 2, \ldots, N$, find:

- the number of dishes at the AtCoder Restaurant that he can eat immediately after overcoming ingredient B_i on day i.

Constraints

- $1 \leq N \leq 3 \times 10^5$
- $1 \leq M \leq 3 \times 10^5$
- $1 \leq K_i \leq N\ (1 \leq i \leq M)$
- The sum of K_i is at most 3×10^5.
- $1 \leq A_{i,j} \leq N\ (1 \leq i \leq M, 1 \leq j \leq K_i)$

- $A_{i,j} \neq A_{i,k}\ (1 \leq i \leq M, j \neq k)$
- $1 \leq B_i \leq N\ (1 \leq i \leq N)$
- $B_i \neq B_j\ (i \neq j)$
- All input values are integers.

Input

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

$$
\begin{array}{llllll}
N & M & & & & \\
K_1 & A_{1,1} & A_{1,2} & \dots & A_{1,K_1} \\
K_2 & A_{2,1} & A_{2,2} & \dots & A_{2,K_2} \\
\vdots & & & & & \\
K_M & A_{M,1} & A_{M,2} & \dots & A_{M,K_M} \\
B_1 & B_2 & \dots & B_N & &
\end{array}
$$

Output

Print N lines. The k-th line should contain the answer for $i = k$.

Sample Input 1 Copy

Copy

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

Sample Output 1 Copy

Copy

```
0
1
2
3
4
```

Snuke overcomes his disliked ingredients as follows:

- Day 1: He overcomes ingredient 1. At this time, every dish still uses a disliked ingredient, so print 0.

- Day 2: He overcomes ingredient 3. Dish 4 no longer uses any disliked ingredient and becomes edible; all other dishes still use disliked ingredients, so print 1.
- Day 3: He overcomes ingredient 2. Dish 1 no longer uses any disliked ingredient and becomes edible; all dishes except 1 and 4 still use disliked ingredients, so print 2.
- Day 4: He overcomes ingredient 5. Dish 3 no longer uses any disliked ingredient and becomes edible; all dishes except 1, 3, and 4 still use disliked ingredients, so print 3.
- Day 5: He overcomes ingredient 4. Dish 2 no longer uses any disliked ingredient and becomes edible; now all dishes have no disliked ingredients, so print 4.

Sample Input 2 Copy

Copy

```
9 8
1 4
5 6 9 7 4 3
4 2 4 1 3
1 1
5 7 9 8 1 5
2 9 8
1 2
1 1
6 5 2 7 8 4 1 9 3
```

Sample Output 2 Copy

Copy

```
0
0
1
1
1
2
4
6
8
```

/#telegram)

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