

COCI '17 Contest 6 #2 Alkemija

Time limit: 1.0s **Memory limit:** 64M

In ancient times, when alchemists were searching for gold, the world was familiar with a total of N distinct substances, denoted with 1 to N . During many years of hard work, searching for the secret formula, alchemists discovered a series of interesting regularities - *alchemical reactions*. In one reaction, it's possible to transform substance set $\{X_1, X_2, \dots, X_L\}$ to another substance set $\{Y_1, Y_2, \dots, Y_R\}$. For example, the substance set $\{1, 4, 5\}$ might react once and create the new substance set $\{2, 6\}$.

Joško is a modern alchemist and has M distinct substances denoted with A_1, A_2, \dots, A_M . He has an unlimited quantity of each substance from that set. Joško wants to know which substances he can create using a list of reactions of ancient alchemists, so he's asking you to help him solve this problem.

Input Specification

The first line of input contains two integers N and M ($1 \leq M \leq N \leq 100\,000$), the numbers from the task.

The second line of input contains M integers A_i ($1 \leq A_i \leq N$), labels of the substances Joško has in the beginning.

The third line of input contains the integer K ($1 \leq K \leq 100\,000$), the number of known reactions.

The following $3K$ lines contain a list of reactions. Each reaction is described with 3 lines in the following way:

- The first line contains the integers L and R ($1 \leq L, R \leq N$).
- The second line contains L distinct integers X_i ($1 \leq X_i \leq N$).
- The third line contains R distinct integers Y_i ($1 \leq Y_i \leq N$).
- This describes the reaction with which the substance set $\{X_1, X_2, \dots, X_L\}$ transforms into substance set $\{Y_1, Y_2, \dots, Y_R\}$.

The sum of all L values won't exceed 100 000.

The sum of all R values won't exceed 100 000.

Output Specification

The first line of output must contain the integer X , the number of obtainable substances.

The second line of output must contain X distinct integers B_i , sorted ascendingly, that represent the labels of the obtainable substances.

Scoring

In test cases worth 60% of total points, it will hold:

- $N, K \leq 500$.
- The sum of all L values and the sum of all R values won't exceed 500.

Sample Input 1

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

Sample Output 1

```
4
1 2 3 4
```

Explanation for Sample Output 1

There are 2 reactions.

The first reaction transforms substance set $\{1, 2\}$ into substance set $\{3\}$.

The second reaction transforms substance set $\{1, 3\}$ into substance set $\{4\}$.

Joško initially has substances from the set $\{1, 2\}$.

Using the first reaction, Joško can obtain substance 3, after which he has substances from the set $\{1, 2, 3\}$.

After that, using the second reaction, he can also obtain substance 4.

Sample Input 2

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

Sample Output 2

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

Explanation for Sample Output 2

Joško initially has substances from the set $\{1, 4, 5\}$.

Using the second reaction, it is possible to obtain substance 6, after which it is possible to apply the third reaction, giving substance 2.

The first reaction is impossible to apply because Joško doesn't have substance 3.