Problem H

Writing Tasks

In 2020, there are C programming contests held in Indonesia, numbered from 1 to C. Each contest has zero or more tasks written for the contest. There are A task authors who can write tasks for these contests, numbered from 1 to A. The ith task author only likes the set of contests $L_i \subseteq \{1, 2, \ldots, C\}$, and only wants to write tasks for contests in L_i. Each task author cannot write more than one task for the same contest.

There are also T topics in programming contest tasks, numbered from 1 to T. For example, topic 1 might be about graph tasks, topic 2 might be about string tasks, and so on. Each task has exactly one topic. The ith task author is familiar with the set of topics $F_i \subseteq \{1, 2, \ldots, T\}$, and only wants to write tasks about topics in F_i. Each task author cannot write more than one task about the same topic.

Additionally, each contest also has a syllabus. The jth contest syllabus contains the set of topics $S_j \subseteq \{1, 2, \ldots, T\}$, and the topic for the tasks written for the contest must be in S_j. Each contest cannot have more than one task for the same topic.

You are a programming contest enthusiast in Indonesia. Surprisingly, you observed the following:

- Each task author likes at most two contests. Similarly, each contest is liked by at most two task authors.

- Each task author is familiar with at most two topics. Similarly, each topic is familiarized by at most two task authors.

- Each contest has at most two topics in its syllabus. Similarly, each topic is present in at most two contest syllabuses.

You want to find the maximum total number of tasks that can be written across all contests.

Input

Input begins with a line containing three integers: $A\ C\ T$ ($1 \leq A, C, T \leq 50\,000$) representing the number of task authors, contests, and topics, respectively.

The next A lines each begins with an integer: $|L_i|$ ($0 \leq |L_i| \leq 2$) representing the number of contests that the ith task author likes, followed by $|L_i|$ integers: $L_i[x]$ ($1 \leq L_i[x] \leq C$) representing the liked contests. It is guaranteed that the values in L_i are distinct. It is also guaranteed that for all $1 \leq j \leq C$, the value j only appears at most twice in $\bigcup_{i=1}^{A} L_i$.

The next A lines each begins with an integer: $|F_i|$ ($0 \leq |F_i| \leq 2$) representing the number of topics that the ith task author is familiar with, followed by $|F_i|$ integers: $F_i[y]$ ($1 \leq F_i[y] \leq T$) representing the familiarized topics. It is guaranteed that the values in F_i are distinct. It is also guaranteed that for all $1 \leq k \leq T$, the value k only appears at most twice in $\bigcup_{i=1}^{A} F_i$.

The next C lines each begins with an integer: $|S_j|$ ($0 \leq |S_j| \leq 2$) representing the number of topics in the jth contest syllabus, followed by $|S_j|$ integers: $S_j[z]$ ($1 \leq S_j[z] \leq T$) representing the topics in the syllabus. It is guaranteed that the values in S_j are distinct. It is also guaranteed that for all $1 \leq k \leq T$, the value k only appears at most twice in $\bigcup_{j=1}^{C} S_j$.

Output

Output in a line an integer representing the maximum total number of tasks that can be written across all contests.

Sample Input #1

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

Sample Output #1

```
2
```

Explanation for the sample input/output #1

There are at most two tasks that can be written:

1. The 1st task author writes a task about the 1st topic for the 1st contest.

2. The 2nd task author writes a task about the 1st topic for the 2nd contest.

Note that the 1st task author has written a task about the 1st topic, thus they cannot write a task for the 2nd contest about the same topic.

This example can be illustrated by the following figure, with A_i represents the ith task author, C_j represents the jth contest, T_k represents the kth topic, thick lines represent the first task, and the dashed lines represent the second task.