Problem HOLLOWEARTH: Hollow earth

Some people already suspected it, and it's true: we are living on the outside of a hollow earth! Some even claim that we're living on the inside, but who would listen to such absurd conspiracy theories... In fact, the inside of the hollow earth is inhabited by people like you and me — they call themselves the "insiders". Lately, more and more people have become aware of the inner world, and consequently, the insiders started to fear that their part of the world could be invaded by greedy people from the outside who only want to exploit their abundant resources of He^3.

Thus, the insiders decided to start a gigantic media campaign on the outside by publishing articles depicting people who believe in the inner world as weirdos. They have already created a detailed plan where to publish specific articles by bribing some newspapers.

Shortly before starting their campaign, they noticed an important fact: Newspapers are organized in a hierarchy, where each newspaper has at most one superior newspaper (of course, there are no cycles). Also, each newspaper publishes two types of news: Local and supra-regional news. To save time and money, all newspapers copy all of the supra-regional news of their superior newspaper. They may still add new supra-regional news to their newspaper, though. Local news are only published in one specific newspaper and never copied to others.

Due to this hierarchy, the insiders are able to publish an article in an entire set of newspapers by bribing just one newspaper! While it might be cheaper to change the original plan and publish articles in superior newspapers, the insiders worried that this might draw too much attention. So they decided to stick to their original plan.

Given a newspaper hierarchy and a set of articles with the newspaper they have to be published in, find out the minimum number of newspapers to bribe.
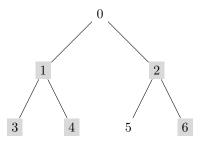

Figure 1: Illustration of the first sample input (first article). The insiders want to publish the article in the newspapers $1, 2, 3, 4, 6$. They can do so by bribing the newspaper 1 to publish the article in the supra-regional section and by bribing newspapers 2 and 6 to publish the article in the local section. Thus, they have to bribe 3 newspapers.

Input

The first line of the input contains an integer N ($1 \leq N \leq 2\,000$), the number of newspapers. The next line contains N integers. The ith integer $S_i (0 \leq S_i < N)$ is the ID of the newspaper the ith newspaper copies all supra-regional articles from, or -1 if there is no such newspaper.

Then follows a single line containing A ($1 \leq A \leq 300$), the number of articles. For each article, a line follows giving L ($0 \leq L \leq N$), the number of newspapers this article is to be published in, followed by L numbers, the IDs of the newspapers P_i ($0 \leq P_i < N$).

Output

One line per article, containing the minimum number of newspapers to bribe.

Sample Input 1

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7
-1 0 0 1 1 2 2
2
5 1 2 3 4 6
7 6 5 4 3 2 1 0
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Sample Output 1

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3
1
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