Coupon Collector

This question is graded for 1.5%!

Statement

Fluffy has been enthusiastically collecting coupons and noticing special price offers from the supermarket, GoodPrice. All these promotions come in the form of a selected group of products sold by the store. If a customer buys all but one of a product promotion group, the store will automatically give the remaining item for free. Quantity bought does not matter, so purchasing 1 item is enough to fulfil the requirement.

Fluffy notices that these promotion groups **overlap**. Hence, the free product he gets from one promotion group, may be the final needed item for another group, giving him yet another free item in turn.

Given the list of promotion groups, and the initial items that Fluffy buys, what is the final list of items Fluffy leaves the store with?

Input

The first line consists of a single integer `N`, N being the number of product promotion groups.

N lines follow, each describing a promotion group, containing 1 or more integers. Each line starts with an integer K_i, the number of products in this group. The remainder of this line has K_i integers, which are the product IDs P_{ij} of the products in this group.

After that, the final line describes the products Fluffy initially pays for. Similar to the promotion group lines, it starts with an integer L, the number of products Fluffy buys. Then, the remainder of the line has L integers Q_i, the IDs of the purchased products.

Constraints

- $2 \leq K_i$ (Each promotion group has at least 2 items.)
- $1 \leq L$ (Fluffy purchases at least 1 item.)
- $1 \leq P_{ij}, Q_i \leq 10^9$ (Item IDs are in $[1 \ldots 10^9]$.)
- The combined length of all promotion groups (and the final purchase group), is at most $350K$.
- No two **promotion** groups contain the exact same list of items.
- Within each item group (promotion or initial purchase), there are no duplicate item IDs.

Output

Print the product IDs of the products Fluffy leaves the store with (after all relevant promotions have been applied), in **ascending order** of item IDs. Each ID should be printed on its own line.

Examples

Sample Input	Expected Output
3 3 1 2 3 2 1 2 2 4 5 1 1	1 2 3

The input describes 3 promotion groups $\{(1,2,3),(1,2),(4,5)\}$, and an initial purchase of (1).

Initially, Fluffy bought only item 1 (as per the final line of the input). This fulfils the condition for the second promotion group $(\mathbf{1},2)$, so we get the last item (ID 2) for free.

This in turn fulfils the first promotion group $(\mathbf{1},\mathbf{2},3)$, and we get item 3.

This no longer fulfils any more promotion groups, so we end here with items $(1,2,3)$, in sorted order.

Notes

1. A skeleton file has been given to help you. You should not create a new file or rename the file provided. You should develop your program using this skeleton file.
2. You are free to define your own helper methods and classes (or remove existing ones) if it is suitable but you must put all the new classes, if any, in the same skeleton file provided.

Skeleton File

You are given the skeleton file `Coupon.java`. You should see the following contents when you open the file:

```java
/**
 * Name          :
 * Matric. No    :
*/

import java.util.*;

public class Coupon {
    private void run() {
    }

    public static void main(String args[]) {
        Coupon runner = new Coupon();
        runner.run();
    }
}
```