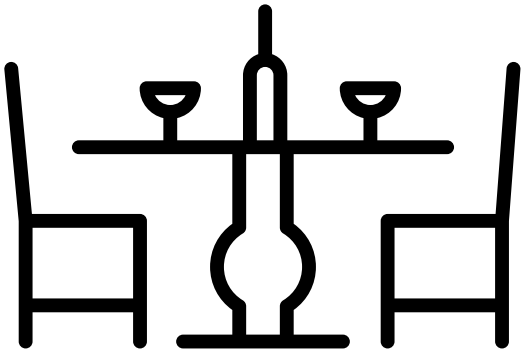
L: Restaurants

Time limit: 3 seconds



Everybody is very happy to go back outside and to restaurants in Paris. However, for a while yet the restaurants have a very limited number of seats. We want to ensure that both restaurants can receive as many people as possible, and that customers go in their preferred seats.

We have N customers, numbered from 1 to N, and M restaurants, numbered from 1 to M. Each customer makes reservation in a subset of the restaurants, and give their list of reservations ordered by preference. Each restaurant ranks the reservations it received by some order of preference – for instance, the restaurant might wish customers who have signed up first to be ranked higher. Each restaurant i also has a capacity c_i, i.e. the maximal number of customers it can support.

Your task is to find an allocation of *some* of the customers in restaurants such that the following conditions are fulfilled:

1. No restaurant places more customers than their capacity.
2. Each customer is given a table in at most one restaurant.
3. There is no restaurant r and customer c having made a reservation for r, such that:
   - c has not been given a table or prefers r to the restaurant he was given a table in, and
   - r has some seats left or r is full but prefers c to at least one of the customers assigned to it.

Other remarks to note:

- Every customer has made at least one reservation.
- Restaurants only rank the customers having expressed a reservation for them. It is possible that a restaurant has no customers wishing to make a reservation.

Input

The first line contains N and M.

The M following lines describe capacities with the i-th line containing an integer c_i, the capacity of restaurant i.

N lines follow. The i-th line describes the list of reservations for customer i, sorted by preferences: the line contains a list of distinct space-separated integers (between 1 and M), from most to least preferred.

M lines follow. The i-th line describes the sorted preferences of restaurant i. This line contains either the number 0 when no customer made a reservation to restaurant i or it contains a list of space-separated distinct integers, the list of customers who made a reservation to restaurant i ordered from most to least preferred by the restaurant.

Output

The output described the set of customers which have a table in one possible allocation (according to the rules above). The set is given with one customer per line, sorted ascending by id.

Limits

- $1 \leqslant N \leqslant 50\,000$
- $1 \leqslant M \leqslant 10\,000$
- total number of reservation options is at most 1 000 000.
- $1 \leqslant c_i \leqslant N$

Sample Input

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

Sample Output

```
2
3
4
```