D Job Assignment

You are given a set of workers, a set of jobs, and a catalog of skills. Each job requires exactly one skill, and each worker can perform any job whose required skill they possess. A worker can take at most one job. Additionally, each skill has a limited number of available "slots" (for example, due to licensing or equipment), so only a limited number of jobs that require that skill can be staffed overall.

Your task is to compute the maximum number of jobs that can be assigned under these constraints. This problem is intended to be solved using a max flow formulation.

Input

The first line contains an integer T, the number of test cases.

Each test case starts with a line containing three integers N, M, and S:

- N — number of workers

- M — number of jobs

- S — number of distinct skills

The second line of each test case contains S integers $L_1 \ldots L_S$, where L_s is the maximum number of jobs that can be staffed using skill s.

The next N lines describe workers. Each line starts with an integer k, followed by k integers listing the skills that worker has.

The next M lines each contain a single integer r_j, the required skill for job j.

Skills are numbered from 1 to S.

- $1 \le T \le 10$

- $1 \le N, M, S \le 10^4$ for each test case

- $0 \le k \le S$

- $1 \le r_j \le S$

- $0 \le L_s \le M$

- Sum of all N across test cases is at most 10^4

- Sum of all M across test cases is at most 10^4

- Sum of all S across test cases is at most 10^4

- Sum of all k across all workers and all test cases is at most 10^4

Output

For each test case, print a single integer: the maximum number of jobs that can be assigned.

Samples

Sample input 1	Sample output 1
1 3 4 2 2 1 2 1 2 1 1 1 2 1 1 2 2	3

Sample input 2	Sample output 2
2 2 2 2 1 1 1 1 1 2 1 2 3 3 1 2 1 1 1 1 1 1 1 1 1	2 2

Notes

In first example, skill 1 can staff at most 2 jobs and skill 2 can staff at most 1 job. The maximum assignment fills two jobs requiring skill 1 and one job requiring skill 2, for a total of 3 jobs.

In second example. In the first test case, each skill has capacity 1 and there are two workers who cover both skills, so two jobs can be assigned. In the second test case, all three jobs require the only skill, but only two slots are available, so at most two jobs can be assigned.

Scoring

- 10%: sample tests.

- 30%: $N, M, S \leq 20$.

- 30%: $N, M, S \leq 500$.

- 30%: $N, M, S \leq 10^4$.