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HS 2012
Exercise Sheet BGL Week IV

Algorithms Lab

Exercise 4 – *Cantonal Courier*

To earn money for the journey of your dreams (Barcelona, Gothenburg and London) you come up with an idea for a shipping company. You are going to have an employee (a courier) in each canton of Algoland. The caveat that is going to let you offer competitive rates while promoting sustainability is that your couriers are going to use public transport. The distinctive feature of Algoland's public transport system is that each canton consists of several zones – depending on the route you need to buy tickets for some subset of those zones.

For each canton you are given a list of possible assignments and the reward for each of them that a customer will pay if you agree to take it. For each assignment you are also given the list of zones for which you need a ticket in case you take it. Finally, you are given the price of the ticket for each zone. All the tickets are day passes and your couriers are truly excellent, so you can be sure that once bought, a single ticket can be reused for several jobs.

Find the optimal profit (payment from jobs minus costs of tickets) you can achieve for each canton.

Input The first line of the input contains $1 \leq T \leq 100$, the number of testcases.

Each testcase describes a single canton and starts with a line holding two integers: $1 \leq Z, J \leq 100$, where Z is a number of zones and J number of jobs. In the next line there are Z integers $c_1, \ldots, c_Z, 1 \leq c_i \leq 5000$, where c_i is the cost of the ticket for zone i. The third line contains J integers $p_1, \ldots, p_J, 1 \leq p_i \leq 5000$, where p_i is the reward for job i.

J lines follow: i-th of those lines describes the tickets needed for job i. Each of those lines starts with $0 \leq N_i \leq Z$, followed by a strictly increasing sequence of N_i zones (1-based) for which the tickets are needed.

All consecutive numbers in a line are single-space separated.

Output For each testcase output a single line with an integer: your profit given optimum choice of jobs.

Sample input

```
2
4 3
1 5 6 7
3 4 10
2 1 2
1 2
2 3 4
3 3
3 3 3
4 4 4
3 1 2 3
3 1 2 3
3 1 2 3
```

Sample output

```
1
3
```