Problem B: Deliveries

Time limit: 20s, memory limit: 1GB.

After finishing his Master's, Krzysztof decided it's time to stop coloring graphs and find a job. He chose a new domain: logistics. After a week-long search he started as a delivery guy in Linear Eats.

Krzysztof delivers packages along an infinite bidirectional road, which can be modelled as OX axis. He starts every shift at position 0 and goes back and forth to fulfill his duties. This is not a standard 9-to-5 job. The only requirement is that he delivers all packages assigned to him. Thus his shift can end at any point when all packages are delivered.

On his first day, he received n delivery requests. Each request consists of a single pickup location and one or more possible destinations. Krzysztof can deliver a package to any of those destinations. Obviously, to deliver a package he first needs to pick it up.

Moreover, Krzysztof is a proud owner of a driving license. That's why he was assigned a company van, so he can collect as many packages as he needs.

What is the minimum total distance he needs to travel to deliver all packages?

Input

The first line of input contains the number of test cases z ($1 \leqslant z \leqslant 10\,000$). The descriptions of the test cases follow.

The first line of each test case contains a single integer n ($1 \leqslant n \leqslant 200\,000$) – the number of packages to deliver.

Next n lines describe delivery requests. Each line starts with integers s_i and k_i ($-10^9 \leqslant s_i \leqslant 10^9, 1 \leqslant k_i \leqslant 100$) – the pickup location and number of possible destinations respectively. Then k_i integers $t_{i1}, \ldots, t_{ik_i}$ ($-10^9 \leqslant t_{ij} \leqslant 10^9$) follow – the possible destinations. It is guaranteed that the coordinates $s_i, t_{i1}, \ldots, t_{ik_i}$ in a single request are pairwise distinct.

The sum of n over all test cases does not exceed $2\,000\,000$. The sum of k_i over all test cases does not exceed $4\,000\,000$.

Output

For each test case, print in a single line the minimum distance that needs to be traveled to deliver all packages.

Example

For an example input	the correct output is
2 4 5 3 -1 1 25 10 3 3 5 12 15 2 13 25 -1 2 -2 10 2 1 1 -2 -5 1 5	27 17

Explanation

In the first test case, the optimal route is as follows:

- Krzysztof starts at position 0 as he always does.
- He moves to position -1 and picks up the fourth package.
- He moves to position 5 and grabs the first package. After this step, he has two packages.
- He moves to position 1 and drops the first package. After this step, he still has the fourth package.
- He moves to position 10, drops the fourth package and picks up the second package.
- He moves to position 12 and drops the second package.
- He moves to position 15 and grabs the third package.
- Finally, Krzysztof moves to position 13 and delivers the final package.