Escape

Introduction

In order to satisfy the "immoderate curiosity of the world" (or rather "the urge to conquer everything that exists" as enemy fractions call it), the beetlejumpers need valuable resources. During their mining works in the asteroid group HTA-13, they discovered upon the deposits of dangerous gas that could destabilize artificial atmosphere created around the asteroid group. The risk of an accident was so high that it forced the Executive Engineer to evacuate the beetlejumpers from all asteroids. The presence of the gas prevented beetlejumpers from using typical beetlebase transport ships as they could approach the contaminated site only at a certain distance.

Fortunately, each asteroid was prepared for such a possibility and equipped with an escape vehicle - Quadroplane, which ensures a safe travel from the surface of the asteroid to the base ship. A unit can transport up to four passengers. Moreover, Quadroplane is powered by the force generated by muscle fiber of beetlejumpers present at the ship. Due to the fact that the force has to be transferred synchronously, the speed depends only on the fitness of the weakest individual (not on the number of crew members).

In his report on the evacuation, the Executive Engineer has to present the exact data concerning the minimal time needed for the whole process. The task of estimating the values has been assigned to you. Knowing the distance between asteroids and the nearest base ship as well as the fitness levels of passengers (the jump kinetics of each beetlejumper working on gas extraction is regularly examined) you have estimated how much time each passenger would need to cover the distance with a Quadroplane on their own.

Problem

Finish your calculation and provide the minimal time required to fully evacuate each asteroid.

Input data

Testing sets are located in escape*.in files.

The first line of the testing set has the number N, which is the number of asteroids with passengers to be evacuated. The rest of the file has N line pairs.

In each pair there is the K number on the first line, it is the amount of beetlejumpers present at a given asteroid; the second line has K numbers indicating individual times required to cover the escape route T (integer numbers representing minutes) for each beetlejumper at a given asteroid.

$$1 \leq N \leq 1000$$
$$1 \leq K \leq 2000$$
$$1 \leq T \leq 2000$$

Output data

For each asteroid it is necessary to submit a single result line with the minimal number of minutes needed for the evacuation. Asteroids order has to be the same as in the input data.

Example

For input data:

```
2
6
1 2 3 4 1 2
8
3 9 21 8 9 15 5 4
```

A correct answer file would be:

```
7
40
```

Score

If the answer for a given set is correct, the score is 1; otherwise the score is 0.