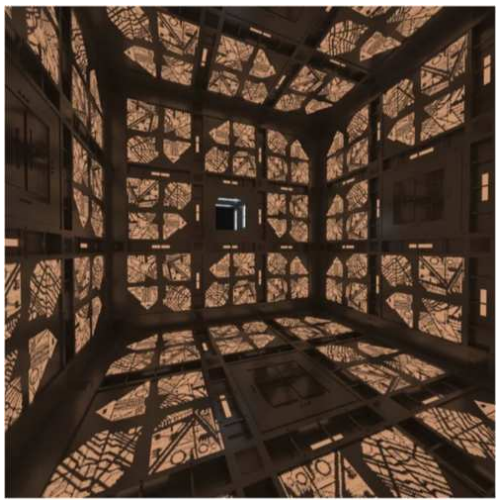
The Cube

P66524_en

Vint-i-tresè Concurs de Programació de la UPC - Semifinal (2025-06-20)

You are locked in "The Cube". It is a gigantic three-dimensional structure made up of cubic rooms distributed in a three-dimensional grid. Therefore, we can identify each room with its coordinates $(x, y, z) \in \mathbb{Z}^3$. Two rooms that completely share a face are connected. Hence, every room has six adjacents rooms. You need one minute to move from a room to any adjacent room.



After some exploration, you have discovered a way out. You have identified n special rooms with coordinates (x_i, y_i, z_i). You know that at a certain moment an alarm will sound and an announcement of which of the n rooms is the exit will be broadcast. To maximize your chances of survival, you will wait in a room that minimizes the average time to reach a special room.

Can you compute the sum of times to reach every special room if you place yourself in an optimal room?

Input

Input consists of several cases, each with n, followed by n different triplets $x_i\ y_i\ z_i$. Assume $1 \leq n \leq 10^5$ and that the coordinates are natural numbers between 1 and 10^9.

Output

For every case, print the minimum sum of times to reach every special room.

Sample input

```
1  23 42 100
2  1 1 1  10 20 30
4  1 1 1000000000  1 1000000000 1  1000000000 1 1  999999999 999999998 999999997
```

Sample output

```
0
57
5999999988
```

Problem information

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