Problem E.
Pairing Points in Three-Dimensional Spaces

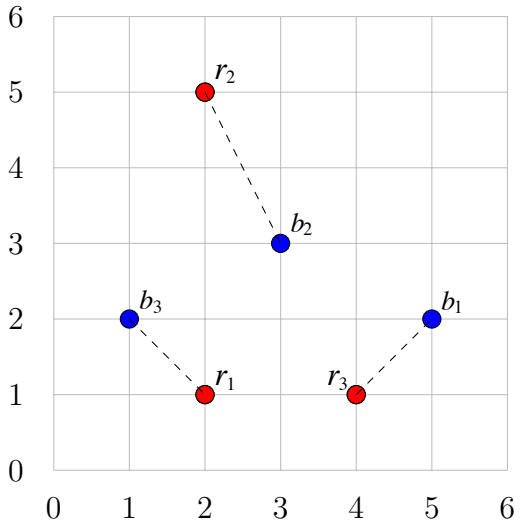
Time limit: 5 seconds

We are particularly concerned with the problem of pairing points in three-dimensional spaces. There are two sets of equally sized points, each with coordinates (x, y, z), and we need to group these points into pairs. The cost of pairing two points is the *squared Euclidean distance* between them. The goal is to find the optimal pairing such that the total cost is minimized.

Formally, there are two sets of n points; namely red points $R = \{r_i, r_2, \ldots, r_n\}$ and blue points $B = \{b_1, b_2, \ldots, b_n\}$, where $r_i, b_i \in \mathbb{R}^3$ for all $1 \le i \le n$. The cost function between two points p and q is defined by

$$\text{cost}(p, q) = (p_x - q_x)^2 + (p_y - q_y)^2 + (p_z - q_z)^2.$$

For example, consider the the following two sets of 3 points; here the red points $R = \{r_1 = (2, 1, 0), r_2 = (2, 5, 0), r_3 = (4, 1, 0)\}$ and blue points $B = \{b_1 = (5, 2, 0), b_2 = (3, 3, 0), b_3 = (1, 2, 0)\}$.



(An illustration of the plane $z = 0$.)

It can be easily verified that the corresponding minimum cost can be achieved by pairing b_1 with r_3, b_2 with r_2, and b_3 with r_1; note that the minimum total costs in the pairing is $2 + 2 + 5 = 9$.

Input

The first line of input contains an integer T indicating the number of test cases. The following lines describe T cases in order.

For each test case, the first line contains an integer n indicating the number of points in sets R and B. Subsequently, it is followed by $n+n=2n$ lines. Each of the first n lines contains three integers representing the (x, y, z)-coordinates of the red points; each of the other n lines contains three integers representing the coordinates of the blue points.

Note that the given points may have same coordinates of (x, y, z).

- $1 \leq T \leq 20$
- $1 \leq n \leq 250$
- $0 \leq x, y, z \leq 40000$ for all the given points.

Output

For the output for each test case, please print out an non-negative integer as the the minimum total costs in the optimum pairing.

Sample Input	Sample Output
1 3 2 1 0 2 5 0 4 1 0 5 2 0 3 3 0 1 2 0	9

Sample Input	Sample Output
2 1 2018 2018 2018 2019 2019 2019 2 0 0 100 0 0 100 0 0 100 0 0 100	3 0

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