Problem A

A demon is captured in a plane fortress. The demon is at the point with coordinates $(0, 0)$, and around it there is a number of walls; each wall is a straight line segment, and any two of these segments can intersect only in their endpoints. The demon cannot leave—any curve from $(0, 0)$ to infinity intersects at least one of the walls.

However, maintaining the fortress is quite expensive; for each of the walls, we are given the amount it costs to keep it in good repair. As our budget is quite tight, we would like to determine the cheapest way how to keep the demon contained. That is, determine a set of walls which still ensure that the demon cannot leave, and their total cost is minimum.

Input and output

The first line contains an integer n ($3 \leq n \leq 10^4$), the number of walls. On each of the following n lines, there are five integers x_1, y_1, x_2, y_2, c ($-10^9 \leq x_1, y_1, x_2, y_2 \leq 10^9$, $0 \leq c \leq 10^9$), describing there is a wall of cost c with endpoints (x_1, y_1) and (x_2, y_2). You can assume the point $(0, 0)$ is not contained in any of the walls.

Output a single integer, the minimum total cost of a set of walls with the property that any curve from $(0, 0)$ to infinity intersects at least one of them.

Example

Input:

```
6
-1 -1 1 -1 10
-1 -1 -1 1 10
1 1 -1 1 10
1 1 1 -1 10
-1 1 -10 2 1
1 1 -10 2 1
```

Output:

```
32
```

Problem B

A toy shop sells a number of toys; the toy t has price $p(t)$, quality $q(t)$, and beauty $b(t)$. A toy t' is better than a toy t if it is more expensive, has higher quality, and is more beautiful, i.e., $p(t') > p(t)$ and $q(t') > q(t)$ and $b(t') > b(t)$.

In your class, you have many classmates, and you numbered them 1, 2, 3, ... according to how much you like them (you like number 1 best, then number 2, etc.). You want to give a toy to each of your classmates, but you want to make sure that a classmate that you like more also gets a better toy. You wonder whether this is actually possible; how many toys can you get so that for any two of them, one of them is better than the other one?

Input and output

The first line contains an integer n ($1 \leq n \leq 10^5$), the number of toys. On the i-th of the following n lines, there are three integers p_i, q_i, and b_i ($1 \leq p_i, q_i, b_i \leq 10^9$), giving the price, the quality, and the beauty of the i-th toy. You can assume that no two toys have the same price, the same quality, or the same beauty.

Output a single integer, the maximum number k of toys with indices $i_1, \ldots,$ i_k such that $p_{i_1} < p_{i_2} < \ldots < p_{i_k}$, $q_{i_1} < q_{i_2} < \ldots < q_{i_k}$, and $b_{i_1} < b_{i_2} < \ldots < b_{i_k}$

Example

Input:

```
6
1 1 1
2 3 4
4 2 3
3 4 2
5 5 6
6 6 5
```

Output:

```
3
```