Alice's Delivery Sprint

Note

The difference between the last part and this one is the difference in the input. In the last part, it was possible to get the maximum possible score. But this time, a heuristic is needed that would maximize the score.

Problem Statement

Alice the delivery drone has a list of n delivery locations across the city. Each location has a package with a reward value v if it is delivered *on or before* a specific time. Alice starts from her hub at coordinates $(0, 0)$ and can travel in straight lines at a constant speed.

The reward at each location decreases linearly from the `Deadline` to the `Expire` time. If she delivers a package **before or exactly at** the `Deadline`, she earns the full reward. If she delivers **after** the `Expire` time, she earns nothing. If she delivers in between, the reward is linearly interpolated between full and none.

Your task is to help Alice determine an optimal sequence of deliveries that maximizes her total reward.

Input

- The first line contains an integer n, the number of delivery locations.
- The next n lines each contain three integers x, y, and v — the coordinates of the delivery location and the full reward value.
- The next line contains a float s, the speed at which Alice travels.

- The next line contains two timestamps: `Deadline` and `Expire`.

Constraints

- $1 \leq n \leq 100$
- $0 \leq x, y, v \leq 10^6$
- $0 < s \leq 10^6$
- $0 \leq \texttt{Deadline} < \texttt{Expire} \leq 10^6$

Output

- The first line should contain an integer X, the number of locations Alice should deliver to.
- The second line should contain X space-separated integers — the indices (0-based) of the locations, in the order Alice should visit them.

Scoring

The score for your solution will be:

$$\text{score} = \left(\frac{\text{Total reward earned}}{\text{Total available reward}} \right) \times 200$$

Example

Input

```
2
3 4 10
6 8 20
1
5 15
```

Output

```
2
0 1
```

Explanation

Alice starts at $(0, 0)$. She travels to delivery point 0 and then to point 1. The reward at each point is computed based on the time she reaches the location:

- If arrival time $t \leq$ `Deadline`: reward $= v$
- If $t \geq$ `Expire`: reward $= 0$
- Otherwise: reward decreases linearly between v and 0