Space Miner

Input: from standard input   Output: to standard   output
Source file: space.c

There are M ($1 \le M \le 1{,}000$) planets each with v_i ($1 \le v_i \le 10{,}000$) units of resources and radius r_i ($1 \le r_i \le 100$).

Starting from $(0, 0, 0)$, you travel in straight lines through N ($1 \le N \le 1{,}000$) waypoints in a specific order.

Whenever you travel within $D + r_i$ ($1 \le D \le 50$) units from a planet's center, you can mine the planet using your tractor beam retrieving v_i units of resources. Note that if you are exactly D units from the surface of the planet, you can mine the planet. If your path takes you through a planet, do not worry, since your spaceship can drill through planets, which makes mining even easier. Also note that you cannot mine the same planet on a subsequent visit.

Give the number of minerals that can be mined on your journey.

Hint: you should do all calculations with 64-bit integers.

Input Specification

On the first line of input is the number M, the number of planets. On the next M lines are five integers describing each of the M planets. These integers are $x_i y_i z_i v_i r_i$, where the planet i is at position (x_i, y_i, z_i), (where $-1{,}000 \le x_i, y_i, z_i \le 1{,}000$) and this planet has v_i resources and radius r_i. On the next line is the number N, the number of waypoints to pass through. Each of the next N lines contains the position of these waypoints, as three integers $x_i y_i z_i$ ($-1{,}000 \le x_i, y_i, z_i \le 1{,}000$). The last line of input is the number D, the maximum distance from a planet's surface that your ship can be and still mine a planet.

Output Specification

On one line, output the amount of minerals that you can mine on your journey.

Sample Input

```
3
10  0   1 1
0   10  2 1
0 0 10 4 1
3
8 0 0
0 7 0
0 0 9
1
```

Output for Sample Input

```
5
```