

Spacecraft

Input file: **standard input**
Output file: **standard output**
Time limit: 4 seconds
Memory limit: 1024 megabytes

In a 3-dimensional space, there are N distinct stars shining at different coordinates. The i -th star is located at point $P_i(x_i, y_i, z_i)$. Additionally, a spherical spacecraft with radius R is floating with the origin as its center.

A point p in space is considered a *lovely point* if the following conditions simultaneously hold for $i = 1, 2, \dots, N$:

- Star i is observable from point p . In other words, the line segment with endpoints p and P_i does not pass through or touch the spacecraft's surface.

Find the number of connected components in the region where lovely points exist. Specifically, for the set L of all lovely points and the relation \sim defined below, determine the size of the quotient set L/\sim .

- For $p_1, p_2 \in L$, $p_1 \sim p_2$ if and only if there exists a curve on L with endpoints p_1 and p_2 .

Note that this value can be proven to be an non-negative integer.

Given T test cases, solve each of them.

Input

The input is given from Standard Input in the following format:

```
T
case1
case2
⋮
caseT
```

Each case _{i} ($1 \leq i \leq T$) is given in the following format:

```
N R
x1 y1 z1
⋮
xN yN zN
```

- All values in the input are integers.
- $1 \leq T \leq 10$
- $1 \leq N \leq 500$
- $1 \leq R < \sqrt{x_i^2 + y_i^2 + z_i^2} \leq 10^3$ ($1 \leq i \leq N$)
- $(x_i, y_i, z_i) \neq (x_j, y_j, z_j)$ ($1 \leq i < j \leq N$)
- The answer remains unchanged by the following operations:

- For $i = 1, 2, \dots, N$, independently choose a line l_i passing through the origin and a real number θ_i ($|\theta_i| \leq 10^{-6}$). Move the position of star i to the position obtained by rotating it around the axis l_i by an angle of θ_i .

Output

Output the answer.

Example

standard input	standard output
3	1
4 12	0
13 0 0	3
0 15 0	
0 -15 0	
0 0 15	
6 100	
0 0 101	
0 0 -101	
0 101 0	
0 -101 0	
101 0 0	
-101 0 0	
20 333	
328 -160 -572	
-165 417 -847	
-319 -45 271	
359 -467 -625	
-355 -451 658	
-280 -424 687	
-65 -224 573	
475 -371 373	
-246 -54 -903	
595 -196 -305	
622 -570 -250	
386 -541 -566	
647 455 -424	
734 117 -405	
830 -10 -393	
-334 137 154	
74 459 -92	
-651 -93 -131	
879 148 45	
-48 126 -660	

Note

In the first test case, there exist lovely points.

- For example, $(0, 0, 100)$ is a lovely point. Any line segment connecting this point with any of the given 4 points does not pass through or touch the spacecraft.
- Additionally, $(21, 0, 0)$ is also a lovely point. These two points belong to the same connected component.

In the second test case, there are no lovely points.