

2421 - The Asteroids

Description

It is the year 2111, and the inhabitants of planet Earth are migrating to planet Complexus, mainly because planet Earth is running out of natural resources. The migration towards Complexus is being done using the Ultimate Transportation for Planets (UTP), and is done by selecting different groups of people, which have been chosen according to their profession.

By random chance, the first group of people to travel was the group of computer scientists, and the second group was the group of musicians. Some time after the musician's space shuttle was launched, they were informed about the presence of large asteroids in their path to Complexus, and their assessment is that there are so many asteroids that they urgently need a program that identifies the closest asteroid to their shuttle, so they can perform an evasive maneuver if necessary.

The bad news is that all communication with the computer scientists' space shuttle has been lost. No one on Earth or in the musician's shuttle can communicate with the computer scientists. You are one of the few people remaining on Earth with the skills to create this program. Can you help the musicians reach their destination safely?

The following assumptions can be made for this program:

- The shuttle and the asteroids can be represented in a 2D plane.
- The shuttle can be represented as a single point, with coordinates (X_t, Y_t) .
- The asteroids can be represented as a circle, with its center at (X_i, Y_i) and with a radius R_i ($1 \leq i \leq N$, where N is the total number of asteroids).
- The shuttle will not be inside the area of any asteroid.

No pair of asteroids will intersect. In other words:

$$(R_i + R_j)^2 < (X_i - X_j)^2 + (Y_i - Y_j)^2 \text{ for all } 1 \leq i, j \leq N, \quad i \neq j.$$

The distance between the shuttle and an asteroid is defined as the minimal distance between the circumference that represents the asteroid and the point that represents the shuttle. The distance for the closest asteroid will always be unique. There will be a difference of at least $1e-3$ units between the distances for any two asteroids.

Input specification

Input contains several test cases. The first line of each test case contains an integer N ($1 \leq N \leq 1000$), representing the amount of asteroids around the shuttle. The second line contains two integers X_t, Y_t ($-1000 \leq X_t, Y_t \leq 1000$), representing the shuttle's position. N lines follow, each one with three integer numbers X_i, Y_i and R_i , representing the i th asteroid, where: $-1000 \leq X_i, Y_i$

≤ 1000 , $1 \leq R_i \leq 50$, $1 \leq i \leq N$. Input ends with a case where $N = 0$.

Output specification

For each test case, your program must print the index i ($1 \leq i \leq N$) that identifies the asteroid closest to the shuttle, in a single line. The indices for all the asteroids must be assigned according to the order in which they were given in the input.

Sample input

```
3
0 0
0 -10 5
18 4 6
0 7 3
1
3 3
-1000 -1000 15
0
```

Sample output

```
3
1
```

Hint(s)

Source	Internal Programming Contest IV. UTP, Colombia. Diego Alejandro Agudelo España
Added by	ymondelo20
Addition date	2013-05-19
Time limit (ms)	1000
Test limit (ms)	1000
Memory limit (kb)	130000
Output limit (mb)	64
Size limit (bytes)	15000

Enabled languages

Bash C C# C++ Java Pascal Perl PHP
Python Ruby Text