



北京大学

PEKING UNIVERSITY

JUDGE ONLINE FOR ACM/ICPC



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Meteor Shower

Language:

Time Limit: 1000MS

Memory Limit: 65536K

Total Submissions: 28055

Accepted: 7246

Description

Bessie hears that an extraordinary meteor shower is coming; reports say that these meteors will crash into earth and destroy anything they hit. Anxious for her safety, she vows to find her way to a safe location (one that is never destroyed by a meteor) . She is currently grazing at the origin in the coordinate plane and wants to move to a new, safer location while avoiding being destroyed by meteors along her way.

The reports say that M meteors ($1 \leq M \leq 50,000$) will strike, with meteor i will striking point (X_i, Y_i) ($0 \leq X_i \leq 300$; $0 \leq Y_i \leq 300$) at time T_i ($0 \leq T_i \leq 1,000$). Each meteor destroys the point that it strikes and also the four rectilinearly adjacent lattice points.

Bessie leaves the origin at time 0 and can travel in the first quadrant and parallel to the axes at the rate of one distance unit per second to any of the (often 4) adjacent rectilinear points that are not yet destroyed by a meteor. She cannot be located on a point at any time greater than or equal to the time it is destroyed).

Determine the minimum time it takes Bessie to get to a safe place.

Input

* Line 1: A single integer: M

* Lines 2.. $M+1$: Line $i+1$ contains three space-separated integers: X_i , Y_i , and T_i

Output

* Line 1: The minimum time it takes Bessie to get to a safe place or -1 if it is impossible.

Sample Input

```
4
0 0 2
2 1 2
1 1 2
0 3 5
```

Sample Output

```
5
```

Source

USACO 2008 February Silver

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