

Watering Grass


Problem ID: grass

CPU Time limit: 2 seconds

Memory limit: 1024 MB

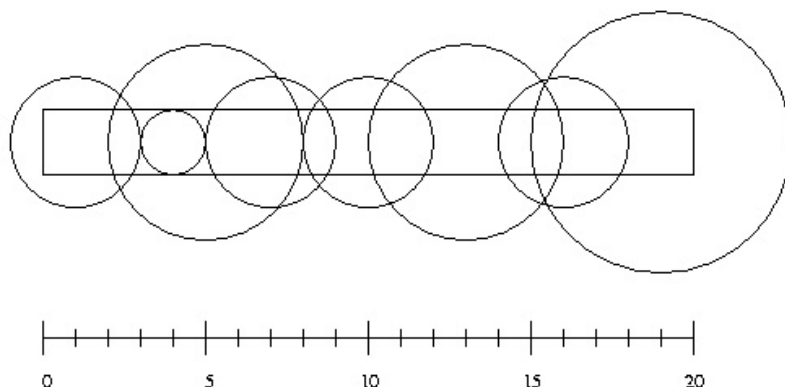
Difficulty: 5.4

Author: Piotr Rudnicki

License: 

n sprinklers are installed in a horizontal strip of grass l meters long and w meters wide. Each sprinkler is installed at the horizontal center line of the strip. For each sprinkler we are given its position as the distance from the left end of the center line and its radius of operation.

What is the minimum number of sprinklers to turn on in order to water the entire strip of grass?



Input

Input consists of at most 35 cases. The first line for each case contains integer numbers n , l and w with $1 \leq n \leq 10\,000$, $1 \leq l \leq 10^7$, and $1 \leq w \leq 100$. The next n lines contain two integers giving the position x ($0 \leq x \leq l$) and radius of operation r ($1 \leq r \leq 1\,000$) of a sprinkler.

The picture above illustrates the first case from the sample input.

Output

For each test case output the minimum number of sprinklers needed to water the entire strip of grass. If it is impossible to water the entire strip output -1 .

Sample Input 1

```
8 20 2
5 3
4 1
1 2
7 2
10 2
13 3
16 2
19 4
3 10 1
3 5
9 3
6 1
3 10 1
5 3
1 1
9 1
```

Sample Output 1

```
6
2
-1
```