IOITC 2016 Practice Test Day 3

Racing Gems

You are playing a racing game. Your character starts at the x-axis ($y = 0$) and proceeds up the race track, which has a boundary at the line $x = 0$ and another at $x = w$. You may start the race at any horizontal position you want, as long as it is within the track boundary. The finish line is at $y = h$, and the game ends when you reach that line. You proceed at a fixed vertical velocity v, but you can control your horizontal velocity to be any value between $-\frac{v}{r}$ and $\frac{v}{r}$, and change it at any time.

There are n gems at specifc points on the race track. Your job is to collect as many gems as possible. How many gems can you collect?

Input

The first line of input contains four space-separated integers: n, r, w, and h. Each of the following n lines contains two space-separated integers x_i and y_i, denoting the coordinate of the i^{th} gem. There will be at most one gem per location.

The input does not include a value for v.

Output

Print, on a single line, the maximum number of gems that can be collected during the race.

Test Data

In all the subtasks,

- $1 \leq n \leq 10^5$
- $1 \leq w, h \leq 10^9$
- $1 \leq x_i \leq w$
- $1 \leq y_i \leq h$

Subtask 1 (40 Points): $r = 1$

Subtask 2 (60 Points): $1 \leq r \leq 10$

Sample Input1

```
5 1 10 10
8 8
5 1
4 6
4 7
7 9
```

Sample Output1

```
3
```

Sample Input2

```
5 1 100 100
27 75
79 77
40 93
62 41
52 45
```

Sample Output2

```
3
```

Sample Input3

```
10 3 30 30
14 9
2 20
3 23
15 19
13 5
17 24
6 16
21 5
14 10
3 6
```

Sample Output3

```
4
```

Limits

Time: 2 seconds

Memory: 256 MB