ECE30018 Problem Solving Studio, Fall 2023

P7. Wells

| Submission due: 1:00 PM, 7 Nov Tue

Wells

The tribe of Isaac and the tribe of Abimelech are sharing a border which runs on a straight horizontal line; Isaacs live in the south side, and Abimeleches in the north side. Abimeleches form n number of villages for $n \leq 10000$. As we represent the border line as $y = 0$, the location of the i-th vileage of Abilemech is represented as (x_i, y_i) where $-10000 \leq x_i \leq 10000$ and $0 \leq y_i \leq 10000$.

As gift to Abimelech, Isaac decided to dig one or multiple wells on the border lines such that every village of Abimelech can reach one of the wells within distance *d*.

Write a program that finds the minimum number of wells that Isaac needs to dig for given locations of Abimelech villages.

Input data

- Input is given as text via the standard input
- The first line has two integers n and d. n is the number of Abimeleches villages, and d is the maximum distance between a Abimeleches villesgae and a well.
- From the second to the (n+1)-th lines, each line has a pair of integers x_i and y_i which is a location of a Abimeleches village.

Output data

- Print the minimum number of wells to the standard output. Your program should return the answer within 0.5 second.

Test case example

Input

```
3 2
1 2
-3 1
2 1
```

Output

```
2
```