# Phobia

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|---|---|
| Input file: | `standard input` |
| Output file: | `standard output` |
| Time limit: | 5 seconds |
| Memory limit: | 512 megabytes |

People with social phobia hate the moment when meeting some acquaintances on the street. So they will try to avoid any chance of making such things happen.

Though hate sudden encounters, people with social phobia still can't stay at home all the time. In order to keep physical health, they will take walks from time to time. The position of each one's house is known, which can be seen as a point on a number axis. We also learned that everyone will move at a constant speed when they take walks.

Now you are given the positions of their houses and their walking speed, and you are able to choose and order $k$ persons to stay home. Your task is to find out, if the remaining persons start to take walks at the same time, for how long at most they can walk without meeting anyone?

## Input

The first line contains two integers $n, k (1 \le n \le 10^5, 0 \le k \le n)$, the total number of persons and the number of persons you can order to stay home.

Then $n$ lines follow, each line contains two integers $x, v (|x|, |v| \le 10^9)$, denoting one person's starting position and walking speed.

It is guaranteed that at the beginning there can only be at most one person at each position of the number axis.

## Output

Print one decimal number, the longgest time they may walk without meeting anyone. If they may keep walking forever without meeting anyone, print `-1`. Your answer is considered correct if the relative or absolute error is below $10^{-4}$.

## Examples

| standard input | standard output |
|---|---|
| 2 0<br>0 1000<br>1 1000 | -1 |
| 2 0<br>0 5<br>10 -6 | 0.909090909091 |
| 2 1<br>0 5<br>10 -6 | -1 |