leeing Sunlight

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

> *Spark Knight Klee of the Knights of Favonius, reporting for duty! ...There's some more, but uh, I forgot. I'm not so good at remembering...*
>
> *—Klee*

Klee's definition of playing is throwing explosives all over the place; she is particularly fond of "fish blasting" — throwing bombs in lakes full of fish.

Today, Klee also plans to blast fish in Starfell Lake. There are n fish in Starfell Lake. Klee will use a bomb with power x, then, every fish whose HP less than or equal to x will be blasted.

However, Klee doesn't know HP of every fish. Instead, she only knows HP of the i-th fish is a uniformly random real number in $[l_i, r_i]$. Now, Klee wants to determine minimum possible x such that the expected number of blasted fish is greater or equal to m.

Your answer will be considered correct, if its absolute or relative error does not exceed 10^{-4}. More formally, if your answer is a and jury's answer is b, your answer will be considered correct if $\frac{|a-b|}{\max(1,b)} \le 10^{-4}$.

Input

The first line contains two integers n, m ($1 \le m \le n \le 10^5$) — the number of fish and Klee's expection of the number of blasted fish.

In the following n line, each line contains two real numbers l_i, r_i ($0 \le l_i \le r_i \le 10^9$), which means HP of the i-th fish will be a random real number in $[l_i, r_i]$.

Output

Output minimum possible x such that the expected number of blasted fish is greater or equal to m.

Examples

standard input	standard output
2 1 1.4 2.8 1.4 2.8	2.1000000000
3 2 1.5 3.0 2.4 5.0 1.919810 1.919810	2.7804878048
1 1 0 1000000000	1000000000.0000000000

Note

In the first example, if Klee throws a bomb with power 2.1, the probability for blasting fish 1 is 0.5, the probability for blasting fish 2 is 0.5, so the expection of the number of blasted fish is $0.5 + 0.5 = 1$.

In the second example, if Klee throws a bomb with power $\frac{114}{41} \approx 2.7804878048$, the probability for blasting fish 1 is $\frac{35}{41}$, the probability for blasting fish 2 is $\frac{6}{41}$, the probability for blasting fish 3 is 1, so the expection of the number of blasted fish is $\frac{35}{41} + \frac{6}{41} + 1 = 2$.

> *Knights of Favonius Spark Knight! Forever with a bang and a flash! —And then disappearing from the stern gaze of Acting Grand Master Jean. Sure, time in solitary confinement gives lots of time to think about new gunpowder formulas...But it'd still be better to not be in solitary in the first place.*