

Mobile

The well-known mobile network operator Totalphone has set up a number of new base transceiver stations in order to cover a newly-built highway with its network. As always the programmers of Totalphone have been sloppy; as a result, the transmission power cannot be set up individually for the stations, but one can only set the transmission power to a fixed common value for all the stations. In order to minimize power consumption, the company wants to know the maximal distance of a point on the highway to the nearest base transceiver station.

Input data

the standard input

The first line of ~~text file mobile.in~~ consists of two integers N ($1 \leq N \leq 10^6$) and L ($1 \leq L \leq 10^9$) representing the number of base transceiver stations and the length of the highway, respectively. N lines follow, each containing a pair of integers x_i, y_i ($-10^9 \leq x_i, y_i \leq 10^9$) which describes the coordinates of a base transceiver station. All points are distinct. Coordinates are sorted in the non-decreasing order with respect to x_i coordinates. If two values of x_i are the same, then coordinates are sorted with respect to y_i coordinates in increasing order.

The highway is a straight line ranging from $(0; 0)$ to $(L; 0)$.

Output data

standard output

The first and only line of the ~~text file mobile.out~~ should contain a single number - the maximal distance of a point on the highway to the nearest base transceiver station. Your output will be regarded as correct if it differs by at most 10^{-3} from the precise result.

Example standard input

standard output

Input data (file mobile.in)	Output data (file mobile.out)
2 10 0 0 11 1	5.545455

Grading

Test cases where $N \leq 5000$ are worth 25 points.

Test cases where $N \leq 100000$ are worth 50 points.

Warning

Use at least double precision floating point numbers for your computations, as smaller types may fail to give the precision required for solving the problem.