Problem F. Flappy Bird

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	1024 mebibytes

Have you ever played *Flappy Bird*? Flappy Bird is a game released on iPhone in May 2013. The player controls a bird that constantly moves to the right and falls, and by tapping, they can make the bird rise. Green pipes continuously appear on the screen to block the bird's path. Specifically, these pipes can be thought of as columns that span from the top to the bottom of the screen, with a gap at a random position in the middle.

The challenge of the game is, of course, to control the bird perfectly to pass through as many pipes as possible. However, one day, a gaming expert named Zisk mastered the game and noticed that the number of pipes seems to be only N (he probably downloaded a pirate version of the game). No matter what he does, he can't get a higher score because he has already passed all the pipes!

Feeling bored, Zisk decided to give himself a new challenge: to find the shortest **path length** from a starting point on the left side of the screen to an endpoint on the right side.

Formally, we can place all the objects on a two-dimensional plane bounded by the rectangle with $0 \le x \le L$ and $0 \le y \le H$. The starting point is at $(0, s)$, and the endpoint is at (L, t). The N pipes are located at the x coordinates $x_1, x_2, \ldots, x_N$, and the gap in the i-th pipe is located in the y-coordinate range $[\ell_i, r_i]$. Consider the bird as a point on the plane, and assume that its path can be an arbitrary curve.

Can you help Zisk calculate the shortest path length so that he can verify his performance?

Input

The first line of the input contains five integers: N, L, H, s, and t, which are described in the problem statement ($1 \le N \le 3 \cdot 10^5$; $1 \le L, H \le 10^9$; $0 \le s, t \le H$).

Each of the next N lines contains three integers: x_i, l_i, and r_i, which describe the i-th pipe ($0 < x_i < L$; $0 \le \ell_i < r_i \le H$).

All x_i are distinct. However, note that the values of x_i may **not** be sorted.

Output

Output a real number representing the shortest path length from the starting point to the endpoint.

Your answer will be accepted if the absolute or relative error does not exceed 10^{-6}. Formally, let your answer be a, and the jury's answer be b. Your answer is considered correct if $\frac{|a-b|}{\max(1,|b|)} \le 10^{-6}$.

Example

standard input	*standard output*	*illustration*
3 9 11 0 11 2 2 5 5 0 2 7 3 6	15.68572788688027230819