

Escape

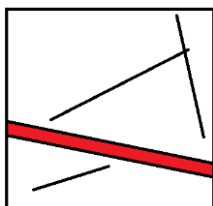


SEASON 6 – ROUND TWO – 250 points

There is a square shaped room, defined by the coordinates of its bottom left corner (0, 0) and the coordinates of its top right corner (1000, 1000). There are N “unstable” fields – segments (x_1, y_1, x_2, y_2) where x_1, y_1, x_2, y_2 are between 0 and 1000.

A robot needs to walk through the room in a straight line by entering through the left wall and exiting through the right wall, not crossing any “unstable” fields (but it can touch them). The robot is not a point (it has a certain width), so it cannot always escape from the room – its path could be blocked by “unstable” fields.

Example of a successful escape:



Ivancho wants to construct a robot with maximum width, which would be able to escape from the room. He wonders what that width is.

Input

The first line of the input file `escape.in` contains the integer N . Each of the following N lines contain four integers x_1, y_1, x_2, y_2 , describing the coordinates of the first and the second point of the current segment.

Output

In the output file `escape.out` write a single real number – the maximum width of the robot. Write the number with four digits after the decimal point.

Constraints

$$1 \leq N \leq 60$$

$$0 \leq x_1, y_1, x_2, y_2 \leq 1000$$

Time limit: 2.0 sec

Memory limit: 256 MB

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Example

Input (escape.in)	Output (escape.out)
4 785 618 829 598 700 757 660 762 244 135 268 178 337 687 356 674	503.7460

Notice – when outputting in C/C++ with printf use %f for double and %Lf for long double.