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 (x1, y1, x2, y2) where x1, y1, x2, y2 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 *x1, y1, x2, y2*, 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 ≤ *N* ≤ 60

0 ≤ *x1, y1, x2, y2* ≤ 1000

**Time limit: 2.0 sec**

**Memory limit: 256 MB**

**Example**

|  |  |
| --- | --- |
| **Input (escape.in)** | **Output (escape.out)** |
| 4785 618 829 598700 757 660 762244 135 268 178337 687 356 674 | 503.7460 |

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