
Problem A. Road Building

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

The burger eating contest is coming! The contest is taking place at two different cities. But there was a slight miscalculation — there is no direct road between these cities across the forest. To save enough time organizers decided to build a direct road with maximum width through the forest without cutting any trees. Moreover, it was decided to leave at least one tree on both sides of the road.

For simplicity, let's represent each tree as a circle on plane with Cartesian coordinates. Build a road of infinite length and maximum width parallel to straight line, that passes through two given points.

Input

First line contains four integers x_s, y_s, x_f and y_f — coordinates of points (x_s, y_s) and (x_f, y_f) that the line passes through.

Second line contains single integer n — number of trees in the forest ($2 \leq n \leq 2 \cdot 10^5$). There are no intersecting trees, but they can touch each other.

Each of the next n lines contains three integers x_i, y_i and r_i — coordinates of the center and radius of i -th tree ($1 \leq r_i \leq 10^9$).

All coordinates' absolute values don't exceed 10^9 .

Output

Output maximum width of the road parallel to straight line, that passes through points (x_s, y_s) and (x_f, y_f) . There should be at least one tree on both sides of the road. The road may touch the trees, but not intersect them. If there is no such road, output 0.

Your answer will be accepted, if it's absolute or relative error doesn't exceed 10^{-6} . Formally speaking, if your answer is a and jury's is b , then it will be accepted if $\frac{|a-b|}{\max(1,b)} \leq 10^{-6}$.

Scoring

Subtask	Score	Constraints	Scoring	Required subtasks
1	27	$2 \leq n \leq 100$	subtask	—
2	19	All radii are equal	subtask	—
3	23	The straight line is parallel to axes	subtask	—
4	31	No additional constraints	subtask	1, 2, 3

Feedback

In subtasks 1, 2, and 3 you will be able to see the outcome for each test.

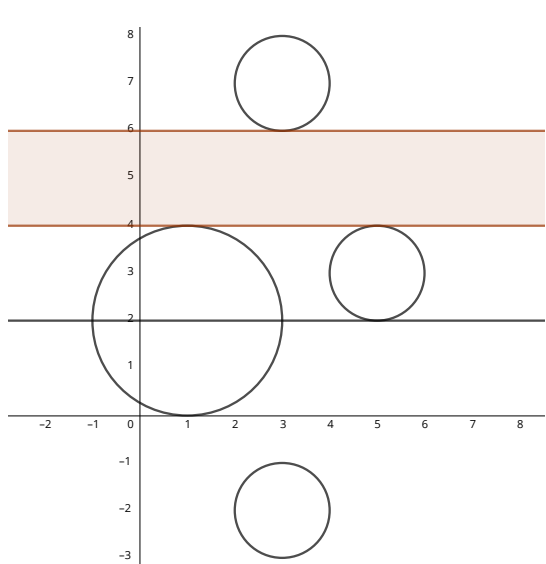
In subtask 4 you will be able to see the total score for the subtask and the outcome for the first failed test.

Examples

standard input	standard output
0 2 4 2 4 5 3 1 3 -2 1 1 2 2 3 7 1	2.0000000000000000
0 3 3 0 3 1 1 2 4 4 1 4 7 2	1.242640687119285

Explanations

First example:



Second example:

