Problem K. Keychain

Input file:	*standard input*
Output file:	*standard output*
Time limit:	10 seconds
Memory limit:	256 mebibytes

Consider a two-dimensional plane and n points $p_1, \ldots, p_n$ on it. Consider n circles $C_1, C_2, \ldots, C_n$: the i-th circle is centered at p_i. All the radii of the n circles are R.

Determine the minimum value of R such that one can draw another *generalized circle* Γ that intersects all the n circles. Please find one such Γ as well.

- A circle C with radius r contains all points such that the Euclidean distance between the point and the center of the circle is exactly r.
- A *generalized circle* is either a circle or a straight line.
- We say two objects A and B intersect if they share a common point.

Input

The first line contains an integer n ($1 \le n \le 3000$). On each of the next n lines, there will be two integers x_i and y_i indicating the coordinates of point p_i ($0 \le x_i, y_i \le 10^5$). It is guaranteed that no two given points coincide.

Output

On the first line, print the optimal answer R_{opt}.

Your output should satisfy $0 \le R_{opt} \le 10^5$.

It can be proved that the minimum value exists and is in this range.

Suppose that Γ_{opt} intersects all $C_1, \ldots, C_n$ when $R = R_{opt}$.

It can be shown that, under the constraints in this problem, Γ_{opt} can be chosen to be either a circle centered at a rational coordinate, or a straight line with integer coefficients.

- In the circle case, print "`C` X Y Z r", which means that the radius is r, and the center of the circle is $O = (X/Z, Y/Z)$.

  The values X, Y, Z must be integers with absolute value not greater than 10^{18}. The value r should be a non-negative real number not greater than 10^{18}.

- In the straight line case, print "`L` a b c", which means that the line L satisfies the equation $ax + by = c$.

  The values a, b, c must be integers with absolute value not greater than 10^{18}.

When checking your answer, the jury will first check whether Γ_{opt} intersects each of the C's. This will be judged by checking:

- if $|R - r| - \varepsilon \le d(O, p_i) \le R + r + \varepsilon$ in the circle case ($d(O, p_i)$ is the Euclidean distance between p_i and O),
- or $R \le d(L, p_i) + \varepsilon$ in the line case ($d(L, p_i)$ is the distance from point p_i to line L).

Here, $\varepsilon = 10^{-6}$.

After that, your answer will be considered correct if the absolute or relative error between your R_{opt} and jury's R_{opt} doesn't exceed 10^{-6}.

Examples

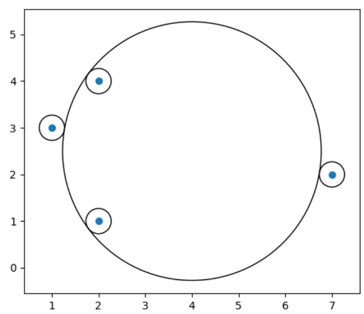
standard input
4 2 1 1 3 2 4 7 2
standard output
0.27069063257455492223 C 1152 720 288 2.77069063257455492234

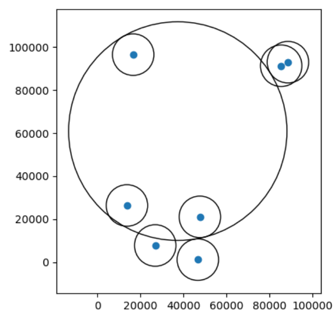
standard input
7 26919 7739 85584 91359 47712 21058 13729 26355 16636 96528 88747 93023 46770 1150
standard output
9663.87959749101919015857 C 3605577680770432 5873755742321056 96368792608 50864.33205303458045065668

standard input
10 756 624 252 208 504 416 378 312 203 287 329 391 0 0 707 703 126 104 581 599
standard output
46.05915288207108030175 L -1248 1512 90300

Note

The first two examples:





Be careful of overflow. Consider using `long double` or `__int128`.