
Problem A. MasterCodeChef Russia

Input file: `standard input`
Output file: `standard output`
Time limit: 3 seconds
Memory limit: 256 megabytes

The success of Russian competitors in programming contests caught the attention of Russian TV channels. Channel Russia 1, in trying to capitalize on the fact that the ACM-ICPC 2020 will be held in Moscow, decided to create a *reality show* on competitive programming, the MasterCodeChef Russia.

However, as soon as they realized the format of the competition, the producers were concerned. How to keep the TV show captivating for 5 hours, in this world of 280 characters and 10-minute videos?

So they made two decisions. The first was to adapt the test, and the second was to hire the legendary *talk show host* Carlos Eduardo Ferreira, from Brazil.

To plan the show, the producers also needed to understand how competitive programmers work. After many field studies, they concluded that a problem p may be described by its theoretical difficulty p_t and by its coding (or implementation) difficulty p_i . A good way to summarize a problem is by its total difficulty $d(p)$, defined by

$$d(p) = p_t^2 + p_i^2.$$

Similarly, a contestant c may be described by the difficulties he imposes into himself when trying to solve a problem: the theoretical difficulty c_t and its coding difficulty c_i . We may summarize its total difficulty $s(c)$ by

$$s(c) = c_t^2 + c_i^2.$$

The producers concluded that a contestant c can solve a problem p within

$$T(c, p) = \frac{s(c) + d(p)}{2}$$

seconds.

In view of this, producers decided that each program will have just one question for the contestants. All contestants start to solve the problem at the same time, and the contest ends when the last contestant finishes his problem.

The beginning of a competition is the most boring moment for spectators. All the competitors are with their hands off the keyboards, gazing at the screen and figuring out what to do. A contestant c solving a problem p only gets interesting in the last $I(c, p) = c_t p_t + c_i p_i$ seconds of the time he takes to solve the problem, and, of course, after solving the problem, since he starts giving interviews to the reporters and joins the rest of the show.

Since every spectator has a favorite contestant and the producers want everyone to be happy, they will use their secret weapon: The amazing entertainment skills of their show host Carlinhos. Carlinhos has to entertain the public until the last contestant gets interesting, so that no spectator gets bored and changes channel.

Since Carlinhos is such a star, it is extremely expensive to pay for his air time. Hence, the producers want to minimize the time t in which he has to entertain the spectators. To do so, they want to choose a problem p such that the inequality

$$T(c, p) - I(c, p) \leq t$$

holds for every contestant c , with minimal t .

Input

The input starts with a positive integer $0 < n \leq 10^5$. After this there are n lines, each with two positive reals c_t and c_i , which describe the theoretical and coding skills of the i th contestant.

For each contestant, we have $0 \leq c_t \leq 10^4$ and $0 \leq c_i \leq 10^4$.

Output

Print 3 real numbers p_t , p_i , and t , which are the theoretical difficulty of the chosen problem, the coding difficulty, and the amount of time during which Carlinhos needs to speak.

We will accept as correct answers with absolute or relative error below 10^{-4} .

Examples

standard input	standard output
2 0 0 4 0	2 0 2
5 0 0 0 1 1 0 1 1 2 2	1 1 1