Gambler's Ruin

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	1024 megabytes

The football match between Bobo United (BU) and Bobo City (BC) is about to start. As an odds compiler working for a gambling company, Bobo needs to set odds for each team.

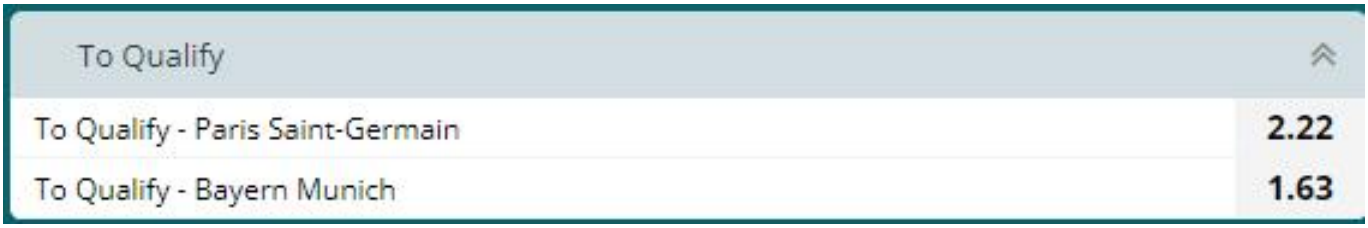
There are n gamblers ready to gamble on this game, and each has an estimated p_i of BU's probability of winning. Here, we consider the setting that the gambling company previously collects all gamblers' information, so each p_i is known.

If you set odd x for BU and odd y for BC, then for each gambler i:

- if $p_i \cdot x \geq 1$, he/she will bet c_i dollars on BU.
- **otherwise,** if $(1 - p_i) \cdot y \geq 1$, he/she will bet c_i dollars on BC.

Suppose the total amount of money bet on BU is s_x dollars and the total amount of money bet on BC is s_y dollars. If BU eventually wins the match, the company needs to pay out $s_x \cdot x$ dollars; if BC wins, the company needs to pay out $s_y \cdot y$ dollars. **In the worst case**, the profit of the gambling company is $s_x + s_y - max(s_x \cdot x, s_y \cdot y)$ dollars (the profit might be negative, meaning the company actually loses money).

Bobo needs to set the value of x and y to maximize the profit **in the worst case**, or otherwise, he might be fired by the company. Can you help him?



An example of pot odds offered by the online gambling company. Source: some mysterious website

Input

The first line contains an integer n ($1 \leq n \leq 10^6$), denoting the number of gamblers.

The n lines follow. The i-th ($1 \leq i \leq n$) line contains a real number p_i and an integer c_i ($0 \leq p_i \leq 1, 1 \leq c_i \leq 10^8$). with meaning already given in the statement. It is guaranteed p_i contains at most 6 digits after the decimal point.

Output

Output a number in one line, denoting the maximum profit the gambling company can get in the worst case by optimally setting the value of x and y. Your answer will be considered correct if its absolute or relative error does not exceed 10^{-6}. Formally, let your answer be a and the jury's answer be b. Your answer will be considered correct if $\frac{|a-b|}{\max(b,1)} \leq 10^{-6}$.

Examples

standard input	standard output
2 1 15 0 10	10.0000000000
3 0.4 100 0.5 100 0.6 100	33.3333333333