Problem K
Knockout Tournament
Time limit: 2 seconds

Laura is organising a knockout tournament, in which her friend Dale takes part. Laura would like to maximise the probability of Dale winning the tournament by arranging the games in a favourable way. She does not know how to do it, so she asked you for help. Naturally, you refuse to cooperate with such a deplorable act—but then you realise that it is a very nice puzzle!

When the number of players is a power of two, the tournament setup can be described recursively as follows: the players are divided into two equal groups that each play their own knockout tournament, after which the winners of both tournaments play each other. Once a player loses, they are out of the tournament.

When the number of players is not a power of two, some of the last players in the starting line-up advance from the first round automatically so that in the second round the number of players left is a power of two, as shown in Figure K.1.

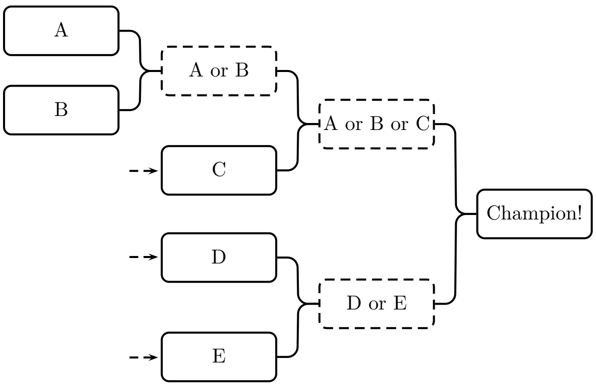

Figure K.1: A tournament tree with 5 players. Players C, D, and E advance from the first round automatically.

Every player has a rating indicating their strength. A player with rating a wins a game against a player with rating b with probability $\frac{a}{a+b}$ (independently of any previous matches played).

Laura as the organiser can order the starting line-up of players in any way she likes. What is the maximum probability of Dale winning the tournament?

Input

The input consists of:

- One line with an integer n ($2 \leq n \leq 4096$), the total number of players.
- n lines, each with an integer r ($1 \leq r \leq 10^5$), the rating of a player. The first rating given is Dale's rating.

Output

Output the maximum probability with which Dale can win the tournament given a favourable setup. Your answer should have an absolute or relative error of at most 10^{-6}.

Sample Input 1	Sample Output 1
4 3 1 2 4	0.364285714

Sample Input 2	Sample Output 2
5 1 1 3 3 3	0.125