2026/2027 SOUTHERN CALIFORNIA REGIONAL INTERNATIONAL COLLEGIATE PROGRAMMING CONTEST

Problem 2
Permutation Computation

You have 2 variables A and B, both of which are initialized to 1, and you are given some number of executable statements of the following 4 forms:

1. $A \mathrel{+}= A$
2. $A \mathrel{+}= B$
3. $B \mathrel{+}= A$
4. $B \mathrel{+}= B$

(In the statements above, "+=" is the addition-assignment operator, which adds the left-hand side and right-hand side together and stores the result in the left-hand side.)

Specifically, you are given o_1 copies of statement 1, o_2 copies of statement 2, o_3 copies of statement 3, and o_4 copies of statement 4.

You want to permute the statements in such a way that $\max(A, B)$ is maximized after executing all the statements in the permuted order. What is this value? Since this value is quite large, print out $\ln \max(A, B)$. Note that $\ln X$ represents the natural logarithm of X, which is the value v such that $e^v = X$.

Input to your program is four space separated integers o_1 o_2 o_3 o_4 ($0 \leq o_1, o_2, o_3, o_4 \leq 500$) on one line, representing the counts of statements 1, 2, 3, and 4. It is guaranteed that $1 \leq o_1 + o_2 + o_3 + o_4 \leq 500$.

Print a single number, representing the natural logarithm of the maximum value of either A or B across all permutations of the statements. Your answer will be accepted if it is within an absolute or relative difference of 10^{-6} from the judges' reference value.

Sample Input

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1 2 1 1
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Output for the Sample Input

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2.8903717579
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