MARATONA DE PROGRAMAÇÃO
InterFatecs

Problema B

# Golden Number

*Arquivo fonte:* goldennumber.{ c | cpp | java | py }
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The golden number is the mathematical representative of perfection in nature. It has been studied since antiquity, and many Greek buildings and artistic works have this number as a base. The golden number is represented by the Greek letter phi and is obtained by the proportion $\phi = \frac{1+\sqrt{5}}{2} = 1.61803399....$ But why is this number so significant? Why does he represent perfection, the beauty of nature? The answer is simple: it appears almost everywhere in nature and in the things we consider most beautiful.

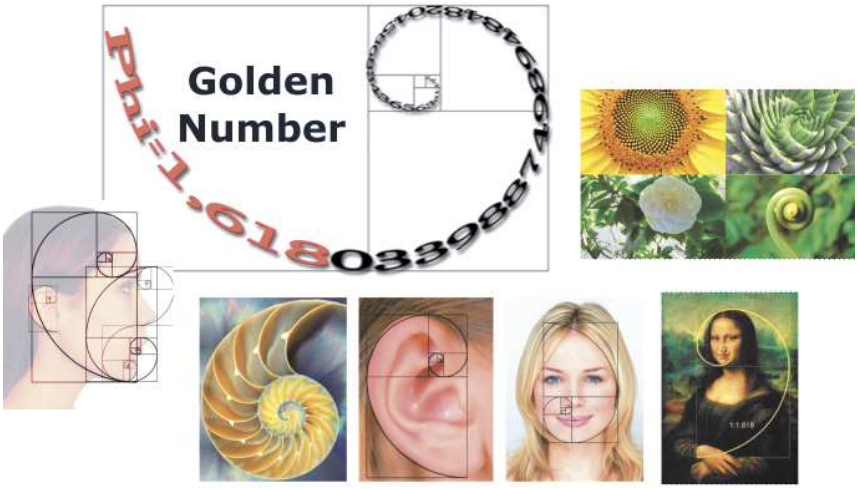


Figura B.1: Examples of the proportion of the number of gold in nature

The golden number can also be found through continued fractions, usually represented as [a,b,c,d,e,...], which results in:

$$\phi = a + \frac{1}{b + \frac{1}{c + \frac{1}{d + \frac{1}{e}}}} \tag{1}$$

The golden number approximation comes with the number of $1s$ in a Series of Fractions representation. The value varies around the golden number, being higher or lower alternately, but always approaching it. Below are some examples of approximation calculations:

$$[a = 1] = 1 + \frac{1}{1} = 2$$

$$[a = 1, b = 1, c = 1] = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1}}}} = 1.66666662693$$

Your job is to produce a program that given an integer representing the quantities of 1s of the continued fraction and answer the approximate golden number.

## Input

Each test case entry consists of an integer $N \leq 100$.

## Output

For each test case your program must output a real number accurate to within 15 places, followed by a line break.

| Example of Input 1 | Example of Output 1 |
|---|---|
| 1 | 2.000000000000000 |

| Example of Input 2 | Example of Output 2 |
|---|---|
| 2 | 1.500000000000000 |