834 - Continued Fractions

Time limit: 3.000 seconds

Continued Fractions

Let $b_0, b_1, b_2, \ldots, b_n$ be integers with $b_k > 0$ for $k > 0$. The *continued fraction* of order n with coeficients $b_1, b_2, \ldots, b_n$ and the initial term b_0 is defined by the following expression

$$b_0 + \cfrac{1}{b_1 + \cfrac{1}{b_{2+\cdots+\frac{1}{b_n}}}}$$

which can be abbreviated as $[b_0; b_1, \ldots, b_n]$.

An example of a continued fraction of order $n = 3$ is $[2; 3, 1, 4]$. This is equivalent to

$$2 + \cfrac{1}{3 + \cfrac{1}{1 + \cfrac{1}{4}}} = \frac{43}{19}$$

Write a program that determines the expansion of a given rational number as a continued fraction. To ensure uniqueness, make $b_n > 1$.

Input