An algorithm to solve the Erdős-Strauss equation. Preliminary report.

The Erdős-Strauss conjecture states: for all integers $n > 1$, $4/n$ have an Egyptian Fraction Development (EFD) of length at most 3, i.e. for all integers $n > 1$ the Erdős-Strauss equation, has a solution: 

$$\frac{p}{q} = \frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3}.$$ 

This conjecture isn’t proven but a result by Mordell states that the conjecture is true for all $n$ except possibly the Mordell primes. We propose here an algorithm that is a Las-Vegas algorithm, i.e. it can fail but when it finds a solution, the solution is correct. The algorithm we propose is very simple, we just need an algorithm that gives an EFD: compute the EFD of $\frac{4i}{q}$ from $i=1$ till a solution of length 3 is found and divide the solution by $i$. Despite its simplicity, this algorithm gives very interesting results with the Bezoutian algorithm:

- For all experiments it has always found a solution;
- It can be quite fast but with some rare pathological cases.
- All integers $i$ that gives a solution verify $(i/q) = -1$.

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