

open source software project which might be of interest to mathematicians

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*Source:* <http://sci.tech-archive.net/Archive/sci.math/2006-04/msg04172.html>

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- *From:* [dj\\_barrow@xxxxxxxxxxxxx](mailto:dj_barrow@xxxxxxxxxxxxx)
  - *Date:* 22 Apr 2006 10:11:04 -0700
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I've a open source software project on my website  
<http://www.ariasoft.ie/gplcontributions.html>

It may be of use in Mathematics, Chemistry, Physics & Economics for Modeling data without a known formula. The program could be enhanced to do automatic algorithm generation using an open source forth language engine like Paflof or else Java bytecode. however it will be about 20 years before computation speeds will make this possible. Here is a description of what it how it works & what it currently does.

Fundamental internally uses reverse polish notation algorithm to search a solution space for a formula given test data, it can search for formulas for sequences of numbers as well as relationships between constants. To date it was successfully able to find the following by a brute force solution space search for..  
generate the maclaurin/taylor series for  $e(x)$   
An estimate formula for the nth prime.  
Design an n bit adder using only boolean logic.

It could have found out that  $\sqrt{\text{permability of material} * \text{permittivity of material}} = \text{speed of light}$  ( one of Maxwells equations ). It could have found the formula for the Balmier lines in the hydrogen spectrum

The Miraculous Bailey-Borwein-Plouffe Pi Algorithm was found by a similar program.

Example:

When set up properly you can enter a sequence like  
5,8,11,14,17 as follows

fundamental -h 5 -m 5 -i 5 5 8 11 14 17

Setting -h to 5 sets the maximum integer in the solution space to 5.

Setting -m to 5 sets the stack depth or the maximum complexity of the sum to 5 terms.

Setting -i to 5 tells fundamental that there are 5 terms following which contain the sequence.

The output of the testrun is:

5 3 n[0] \* +  
(5 + (3 \* n[0]))

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$$5 - 3 - n[0] * +$$
$$(5 + (-3 * -n[0]))$$

So the sequence formula is  $5 + (3 \times n)$   $n$  being an integer.

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