

Re: Recommend please : free math library

Source: <http://sci.tech-archive.net/Archive/sci.math.num-analysis/2005-10/msg00205.html>

- *From:* spellucci@xx (Peter Spellucci)
 - *Date:* Wed, 19 Oct 2005 10:26:48 +0000 (UTC)
-

In article <1129673308.013874.267330@xx>,

linq936@xxxxxxxxxxxxx writes:

>linq...@xxxxxxxxxxxxx wrote:

>> Hi,

>> I am writing a C++ program on network resource assignment and
>> confliction overcoming. After sort out all kinds of requirement and
>> constraints, it boils down to some large linear algebra matrix
>> calculation.

>>

>> If I work it on a paper by hand, I can work out the solution. But the
>> problem is I must implement this in C++ programming.

>>

>> I am wondering how to proceed here? I do not do scientific computing
>> much, I know there are some Fortran libraries doing this kind of work.

>>

>> If there such free library for C++? Is there some entry level
>> tutorial of doing this kind of thing?

>>

>> Thanks so much!

>

>Sorry, I have one thing to add as example.

>

>If I take an extreme example, here is the matrix I can sort out,

>

>/ 1 0 -1024 0 \ * / x1 \ = / 1024 \

>| 0 1 0 -1024 || x2 || 1024 |

> | x3 |

> \ x4 /

>

>I think somehow I can express the above equation in C++, and the
>purpose is to get the answer of x1, x2, x3 and x4.

>

>You can see that there are multiple answers to the above equation, then

>how are they presented from libraries?

>

lapack++ is a possibly entry, and for more look here:

<http://www.faqs.org/faqs/C++-faq/libraries/>

but ... you want the general solution of an underdetermined system of linear

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equations. this can be done only using symbolic, not numeric computation.
then systems like mathematica maple etc would be appropriate.
doing this numerically is also possible "in principle"
(you reduce the matrix to "row echelon" form using e.g. the householder
reduction of the transpose with pivoting, but then you will have to decide
'numerical rank" (since roundoff will make a rank deficient matrix full rank)
use the free variables as parameters and add a basic least squares solution .)
but this is very delicate and not a job for a beginner.
hth
peter
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• ***Follow-Ups:***

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◇ *From:* linq936

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