Subject: Re: geometric mean?
Posted by noymer on Fri, 08 Sep 2000 16:59:06 GMT
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In article <39B8B345.FDF4E45D@dkrz.de>,
Martin Schultz <martin.schultz@dkrz.de> wrote:
> Hi Andrew,
>
> I couldn't find such a routine either so I decided to hack it
> together using the algorithm you suggest but including some error
> cehcking and more caution with range limits or negative values. You
> can find geomean.pro on my web pages:
>
http://www.mpimet.mpg.de/~schultz.martin/idl/html/libmartin_ schultz.html
>
> Cheers,
> Martin
>

Dear Martin,

Thanks!!!

You include checking for negative values, which would mess up the ALOG function.

Since I am taking geometric means of rates that are by definition positive, I did not think of negative numbers.

There is a problem, though...

Someone please correct me if this is wrong; I'm not 100% sure. The way I implemented the geometric mean was not the DEFINITION of the geomean, but rather a computational SHORTCUT.

The DEFINITION goes something like:

GEOMEAN(Arr)=(PROD(Arr))^(1/n), where n is the number of elements, and PROD is the product operator. Logging both sides gets rid of the nasty "nth root" (i.e. ^(1/n)) and turns the product into a sum, which is also nice. Then exponentiating un-transforms the log.

Clearly we can't log any negative number, but we can product a bunch of numbers and then take an nth root of the result. And if there are zero or an even number of negative numbers there will be a real nth root, hence (I guess), the geomean would exist.

I don't know what the convention is with negative numbers, and

it doesn't affect me because I am using positive numbers, but maybe someone out there knows:

(1) Is geomean by convention undefined if any numbers in the set are negative?

(2) Is geomean always the positive nth root? geomean of -2 and -2 is +2?

Cheers,
Andrew