Subject: Re: random number trap
Posted by Adam Shane on Wed, 27 Sep 1995 07:00:00 GMT
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scott@abyss.ATMOS.ColoState.Edu (Scott Denning) wrote:
>
> Peter Webb writes
>> A warning about the random number generator in IDL/PV-Wave (not a bug,
>> per se, but something to watch out for).
>>
>> As the documentation states, if the seed value given to randomu is
>> undefined, it is derived from the system time. The time only changes
>> once per second, however. So if you repeatedly call a procedure that
>> calls randomu, the return will be the same if the calls occur within a
>> second of each other, but will be different if they are in different
>> seconds.
>>
>> This can lead to random numbers being a *lot* more structured than you
>> expect. I had naively expected that the seed value would change each
>> microsecond, so this behavior came as a bit of a surprise.
>>
>> The solution is to place the seed variable in a common block so that it
>> is preserved from call to call, and then each returned sequence will
>> truly be random.
>>
>> Peter
>>
>> ------------------------------
>> Peter Webb, HP Labs Medical Dept
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>
> Actually, the problem goes much deeper than the granularity of the system
> time, and hinges on what you mean by "random." Many scientific users
> expect a "random" variable to have a Gaussian distribution, which no
> "random number generator" in any language is likely to provide.
>
> For an excellent discussion of this problem, as well as nice, simple
> solutions, see W. H. Press et al., 1992: Numerical Recipes, Cambridge
> University Press, Chapter 7 (Random Numbers).
>
> --
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In IDL there are two routines, RANDOMU and RANDOMN. The former gives

a set of random numbers of UNIFORM distribution over the interval [0,1) (assuming you don't keep changing the random number seed as stated above). The latter will give a NORMAL or GAUSSIAN distribution that you say you "expect." A simple but informative example was supplied in the IDL documentation for version 3.6.

Adam Shane
Arete Associates
