Subject: Re: random number trap Posted by Adam Shane on Wed, 27 Sep 1995 07:00:00 GMT View Forum Message <> Reply to Message 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 >> E-Mail: peter_webb@hpl.hp.com >> Phone: (415) 813-3756 > > 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.

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