Subject: monte carlo analysis
Posted by charliesolomon on Fri, 17 Dec 1999 08:00:00 GMT
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Hello ng,

Does anyone have experience with monte carlo analysis in IDL? I'm just starting to research it and would appreciate any insights or pointers in the right direction. The purpose would be to take an existing scientific model and run gads of iterations, using different distributions for the input variables to get statistical results.
Thanks,

Charlie Solomon
csolomon@usc.edu

Subject: Re: monte carlo analysis
Posted by thompson on Sat, 18 Dec 1999 08:00:00 GMT
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charliesolomon@my-deja.com writes:

> Hello ng,

> Does anyone have experience with monte carlo analysis in IDL? I'm just
> starting to research it and would appreciate any insights or pointers
> in the right direction. The purpose would be to take an existing
> scientific model and run gads of iterations, using different
> distributions for the input variables to get statistical results.
> Thanks,

> Charlie Solomon
> csolomon@usc.edu

The trick with Monte Carlo analysis is to generate a properly randomized set of test particles with the correct characteristics. There was some discussion a while back about the properties of the random number generators in IDL. You might check out www.dejanews.com, for example

http://x45.deja.com/ [ST_rn=if]/getdoc.xp?AN=509839686&CONTEXT=945475070.1365508166&hitnum=12

Other than that, Monte Carlo is a fairly straightforward process. IDL may not

be the best language to implement it in, though, because of all the looping
you'll probably need to do.

William Thompson

Subject: Re: monte carlo analysis
Posted by Andy Loughe on Tue, 21 Dec 1999 08:00:00 GMT
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William Thompson wrote:

<snip>

> There was some discussion a
> while back about the properties of the random number generators in IDL. You
> might check out www.dejanews.com, for example

One concern is generating the initial seed.
Here is one simple method using the system clock...

```
seed = long((systime(1) - long(systime(1))) * 1.e8)

;  Then for a Normal distribution:
num_rans = 100000
ran_nums = randomn(seed, num_rans)
stats    = moment(ran_nums)
plot, histogram(ran_nums, binsize=.1), thick=3
print, '1)MEAN,  2)VARIANCE,  3)SKEWNESS,  4)KURTOSIS :', stats
```

Then there is no need to set the seed again, unless you
delvar, seed

--
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"We must believe in free will, we have no choice"-Isaac B. Singer

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Subject: Re: monte carlo analysis
Posted by htonishi on Wed, 22 Dec 1999 08:00:00 GMT

I often set up simple monte carlo analyes in IDL especially when visualization is useful for debugging. However, I have found that you have to be VERY careful about how you code your loops because you can easily loose a factor of 10 in performance if you don't design your loops correctly. I have also found just recently that the profiler in 5.3 (I don't know if it's in earlier versions) is very handy for determining where time is being spent and where you should therefore look to optimize run time.

If, however, you're going to run a lot of monte carlos -- hundreds of thousands or millions of iterations -- then I think you should really consider C or Fortran.

Howard Onishi