Subject: Re: Locate an underflow
Posted by Paul van Delst on Thu, 24 May 2001 14:36:01 GMT
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William Thompson wrote:
>
> Paul van Delst <paul.vandelst@noaa.gov> writes:
>
>> ... If, on running said code, I get a crapload of underflow errors, it's an
>> indication that that either a) the code hasn't been tested very well or b) the
>> programmer didn't really think about the problem enough ...
>
> I disagree. It's exceedingly easy to get underflow errors, and extremely
> difficult to program around them. For example, a simple Gaussian
>
> Y = A*exp(-((X-X0)/Sig)^2)
>
> is almost guaranteed to generate underflow errors. At some point this is going
> to be indistinguishable from zero. You'd have to jump through hoops to avoid
> getting the completely useless underfloat messages.

Not really. what about something like (assuming double precision):

```
tolerance = (MACHAR(/DOUBLE)).EPS

y = DBLARR( N_ELEMENTS( X ) )
xarg = ((X-X0)/Sig)^2
index = WHERE( xarg < tolerance, count )
IF ( count GT 0 ) THEN $
  y = A*exp(-xarg[index])
```

Or, as I mentioned in my reply to Craig:

```
y = A * gaussian_function( (X-X0)/Sig )
```

(or similar) which contains all the bits and pieces for checking. Craig also provided a method of avoiding the underflows.

paulv

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Paul van Delst A little learning is a dangerous thing;
CIMSS @ NOAA/NCEP Drink deep, or taste not the Pierian spring;
Ph: (301)763-8000 x7274 There shallow draughts intoxicate the brain,
Fax:(301)763-8545 And drinking largely sobers us again.
Alexander Pope.