
Subject: IDL is not accurate enough!

Posted by [noahh.schwartz](#) on Thu, 28 Aug 2008 16:30:14 GMT

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Hi,

I've been having problems with IDL accuracy. I'm trying to perform calculations using the gamma function. The problem is that it grows VERY fast! Performing this calculation in double (namely gamma(x)/gamma(y) with x and y big) yields the result: NaN...

Would it be possible to use a program like 'Mathematica' (or any other) and to plug it in my ILD program? Some kind of CALL_EXTERNAL that is to say. If it is possible, how can I do it and what is the best program to use?

Thanks,
Noah

Subject: Re: IDL is not accurate enough!

Posted by [Haje Korth](#) on Tue, 02 Sep 2008 12:20:04 GMT

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Noah,

other in this thread have laid out the issue, nothing to add here. If you want to go brute force with extended precision, check out the cephes math library at <http://www.netlib.org/cephes/>. There is an extended precision version that has a gamma function. I have used that in the past for calculating hypergeometric functions and it served my needs. I used call_external, but you can certainly turn this into a dlm.

Cheers,
Haje

<noahh.schwartz@gmail.com> wrote in message
news:c7b7fc70-b4db-4c3d-8d2b-50f88dbd1d62@s50g2000hsb.google groups.com...

> Hi,

>

> I've been having problems with IDL accuracy. I'm trying to perform
> calculations using the gamma function. The problem is that it grows
> VERY fast! Performing this calculation in double (namely gamma(x)/
> gamma(y) with x and y big) yields the result: NaN...
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> other) and to plug it in my ILD program? Some kind of CALL_EXTERNAL
> that is to say. If it is possible, how can I do it and what is the
> best program to use?

>

> Thanks,

> Noah

Subject: Re: IDL is not accurate enough!

Posted by [Kenneth P. Bowman](#) on Thu, 04 Sep 2008 20:33:21 GMT

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In article

<e32f4688-b58e-4f27-b2f9-17faea24285a@i24g2000prf.googlegroups.com>,
rtk <oneelkruns@hotmail.com> wrote:

> On Aug 28, 2:50 pm, "Kenneth P. Bowman" <k-bow...@null.edu> wrote:
>> Mathematica can do arbitrary-precision arithmetic ... with hundreds of digits,
>> if necessary. Don't expect it to be fast, though, as it is all done
>> in software, not with the hardware floating-point unit with which we
>> normally do single- and double-precision arithmetic.
>
> Check on the IDL code contrib site sometime next week. I just
> uploaded DLMS that add arbitrary precision floating point as well as
> integer and rational types to IDL. These are wrappers on the MPFR and
> GMP libraries, respectively. Caveat emptor, but I'll answer emails.
> You will need to recompile if using something later than IDL 6.3.
> Examples included.
>
> Ron Kneusel
> rkneusel@ittvis.com

So, when you say DLMS, does that mean Windows only? It means nothing
to me as a Linux and Mac user.

Ken Bowman

Subject: Re: IDL is not accurate enough!

Posted by [Michael Galloy](#) on Fri, 05 Sep 2008 15:57:38 GMT

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On Sep 4, 2:33 pm, "Kenneth P. Bowman" <k-bow...@null.edu> wrote:

> So, when you say DLMS, does that mean Windows only? It means nothing
> to me as a Linux and Mac user.

DLMS (Dynamically Loadable Modules) are available on all platforms.
This is a way of wrapping and loading C code to make it usable from
within IDL. DLLs are a Windows thing (the equivalent of a shared
object on Unix).

Mike

--

www.michaelgalloy.com
Tech-X Corporation
Software Developer

Subject: Re: IDL is not accurate enough!
Posted by [MP](#) on Fri, 05 Sep 2008 16:18:27 GMT
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On Sep 5, 9:57 am, "mgal...@gmail.com" <mgal...@gmail.com> wrote:

- > DLMs (Dynamically Loadable Modules) are available on all platforms.
- > This is a way of wrapping and loading C code

and Fortran code, too!

mp

Subject: Re: IDL is not accurate enough!
Posted by [Kenneth P. Bowman](#) on Fri, 05 Sep 2008 16:53:05 GMT
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In article
<53e9aaf0-6cd2-41c0-95ca-1559353845a4@m36g2000hse.googlegroups.com>,
"mgalloy@gmail.com" <mgalloy@gmail.com> wrote:

>> to me as a Linux and Mac user.

>

- > DLMs (Dynamically Loadable Modules) are available on all platforms.
- > This is a way of wrapping and loading C code to make it usable from
- > within IDL. DLLs are a Windows thing (the equivalent of a shared
- > object on Unix).

>

> Mike

> --

> www.michaelgalloy.com
> Tech-X Corporation
> Software Developer

Thanks, Mike. I will take a look and see what I need to do to
make one work.

Ken

Subject: Re: IDL is not accurate enough!
Posted by [pgrigis](#) on Thu, 11 Sep 2008 14:35:27 GMT
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noahh.schwa...@gmail.com wrote:

>> On Thu, 28 Aug 2008, noahh.schwa...@gmail.com wrote:
>>> Hi,
>>
>>> I've been having problems with IDL accuracy. I'm trying to perform
>>> calculations using the gamma function. The problem is that it grows
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>>> other) and to plug it in my ILD program? Some kind of CALL_EXTERNAL
>>> that is to say. If it is possible, how can I do it and what is the
>>> best program to use?
>>
>>> Thanks,
>>> Noah
>>
>> gamma(x)/gamma(y) => exp(lngamma(x)-lngamma(y))
>>
>> regards,
>> lajos
>
>
> lngamma works fine for my propose! Would you know if an equivalent
> function exists for the beselk function? Something like lnbeselk?
> beselk(x) for x>709 doesn't seem to work.

Isn't 0 a good enough approximation?

Paolo

> If not, I guess that I'll have to wait for the DLMS that add arbitrary
> precision floating point...
>
> cheers,
> Noah

Subject: Re: IDL is not accurate enough!
Posted by [pgrigis](#) on Thu, 11 Sep 2008 14:44:44 GMT
[View Forum Message](#) <> [Reply to Message](#)

pgri...@gmail.com wrote:

> noahh.schwa...@gmail.com wrote:

>>> On Thu, 28 Aug 2008, noahh.schwa...@gmail.com wrote:

>>>> Hi,

>>>

>>>> I've been having problems with IDL accuracy. I'm trying to perform

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>> function exists for the beselk function? Something like lnbeselk?

>> beselk(x) for x>709 doesn't seem to work.

>

> Isn't 0 a good enough approximation?

If not, $\log(K(x,n)) - \ln(\sqrt{\pi/(2*x)}) - x$ for large x

Paolo

>

> Paolo

>

>

>> If not, I guess that I'll have to wait for the DLMS that add arbitrary

>> precision floating point...

>>

>> cheers,

>> Noah

Subject: Re: IDL is not accurate enough!

Posted by [noahh.schwartz](#) on Mon, 15 Sep 2008 09:37:01 GMT

On 11 sep, 16:44, pgri...@gmail.com wrote:

> pgri...@gmail.com wrote:

>> noahh.schwa...@gmail.com wrote:

>>> On 28 ao t, 18:42, F LDY Lajos <fo...@rmki.kfki.hu> wrote:

>>>> On Thu, 28 Aug 2008, noahh.schwa...@gmail.com wrote:

>>>> > Hi,

>

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> Paolo

>

>

>

>> Paolo

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>>> If not, I guess that I'll have to wait for the DLMS that add arbitrary

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>

>>> cheers,

>>> Noah

Hi Paolo,

Your approximation seems to be missing a factor? This is what IDL gives me:

```
IDL> x=705d & n=1.1 & print, alog10(beselk(x,n)), (alog(sqrt(!pi/(2*x))))-x)
      -307.50372      -708.05331
```

Cheers,
Noah

Subject: Re: IDL is not accurate enough!
Posted by [pgrigis](#) on Mon, 15 Sep 2008 13:40:22 GMT
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noahh.schwa...@gmail.com wrote:

> On 11 sep, 16:44, pgri...@gmail.com wrote:

>> pgri...@gmail.com wrote:

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```
>> Paolo
>>
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> (2*x)))-x)
>      -307.50372    -708.05331
```

I meant the natural log (why should a bessel function care about base 10 anyway?), so use alog instead.

Cheers,
Paolo

```
>
> Cheers,
> Noah
```
