Subject: Hypergeometric functions
Posted by Ralf Flicker on Wed, 24 Oct 2001 07:37:34 GMT
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Does anybody know of an available IDL implementation for
generalized hypergeometric functions ? I need in particular
2F3(a,b;c,d,e;z^2), which is absolutely convergent for all real
z. I can't seem to find anything among the standard sources, but
thought I'd check here before I start coding it myself.

ralf

--
Ralf Flicker UIN : 65334076
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Hilo 96720, HI, USA Fax : (808) 935-9235

Subject: Re: Hypergeometric functions
Posted by Craig Markwardt on Tue, 30 Oct 2001 03:47:29 GMT
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Ralf Flicker <rflicker@gemini.edu> writes:

> Does anybody know of an available IDL implementation for
> generalized hypergeometric functions ? I need in particular
> 2F3(a,b;c,d,e;z^2), which is absolutely convergent for all real
> z. I can't seem to find anything among the standard sources, but
> thought I'd check here before I start coding it myself.

Hi Ralf--

I see you haven't gotten a response to this question for the past
several days. I think the answer is that IDL is pretty weak on
special functions, although it does have a few.

However, the particular hypergeometric function you are seeking is
rather esoteric. I cannot find it in the GNU scientific library, nor
in CEPHES. These are two C libraries of special functions. [Nor,
for that matter, can I find it cursorily in Abramowitz & Stegun.] It
looks like you will have to code this yourself.

If it's really convergent then it should be rather simple to code the
series directly.

Craig

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Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
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Subject: Re: Hypergeometric functions
Posted by Ralf Flicker on Tue, 30 Oct 2001 06:34:17 GMT
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Craig Markwardt wrote:
>
> Ralf Flicker <rflicker@gemini.edu> writes:
>
>> Does anybody know of an available IDL implementation for
>> generalized hypergeometric functions ? I need in particular
>> 2F3(a,b;c,d,e;z^2), which is absolutely convergent for all real
>> z. I can't seem to find anything among the standard sources, but
>> thought I'd check here before I start coding it myself.
>
> Hi Ralf--
>
> I see you haven't gotten a response to this question for the past
> several days. I think the answer is that IDL is pretty weak on
> special functions, although it does have a few.
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> However, the particular hypergeometric function you are seeking is
> rather esoteric. I cannot find it in the GNU scientific library, nor
> in CEPHES. These are two C libraries of special functions. [Nor,
> for that matter, can I find it cursorily in Abramowitz & Stegun.] It
> looks like you will have to code this yourself.
>
> If it's really convergent then it should be rather simple to code the
> series directly.

Yes, that's what I ended up doing, and it works fine. I realize
the function is somewhat special (the only substantial reference
to 2F3 that I could find on the web was to a Mathematica
implementation), but I was partly fishing for information in
general about these kinds of special functions. As you say, IDL
is a mite weak on this point.

ralf

--
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Subject: Re: Hypergeometric functions
Posted by colinr on Tue, 30 Oct 2001 09:53:17 GMT
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On Mon, 29 Oct 2001 20:34:17 -1000,
Ralf Flicker <rflicker@gemini.edu> wrote:

> Yes, that's what I ended up doing, and it works fine. I realize
> the function is somewhat special (the only substantial reference
> to 2F3 that I could find on the web was to a Mathematica
> implementation), but I was partly fishing for information in
> general about these kinds of special functions. As you say, IDL
> is a mite weak on this point.

There's a book by Slater which contains formulae for asymptotic expansions
etc. of hypergeomtric functions. The book is called, fascinatingly
enough, "Hypergeometric Functions" and is a rip-roaring read. If you
find yourself enthralled by the lyricism of her chapter on integral
representations, may I recommend her thrilling sequel "Confluent Hypergeometric
Functions"?

--
Colin Rosenthal
Astrophysics Institute
University of Oslo

Subject: Re: Hypergeometric functions
Posted by Craig Markwardt on Tue, 30 Oct 2001 15:24:21 GMT
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colinr@toliman.uio.no (Colin Rosenthal) writes:

> On Mon, 29 Oct 2001 20:34:17 -1000,
> Ralf Flicker <rflicker@gemini.edu> wrote:
>
>> Yes, that's what I ended up doing, and it works fine. I realize
>> the function is somewhat special (the only substantial reference
>> to 2F3 that I could find on the web was to a Mathematica
>> implementation), but I was partly fishing for information in
>> general about these kinds of special functions. As you say, IDL
>> is a mite weak on this point.
>

> There's a book by Slater which contains formulae for asymptotic expansions
> etc. of hypergeomtric functions. The book is called, fascinatingly
> enough, "Hypergeometric Functions" and is a rip-roaring read. If you
> find yourself enthralled by the lyricism of her chapter on integral
> representations, may I recommend her thrilling sequel "Confluent Hypergeometric
> Functions"?

I cried in the fourth chapter. (sniff)

Craig

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Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
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