Subject: Re: CalDat
Posted by m.hadfield on Tue, 15 May 2001 22:09:10 GMT
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"Ben Tupper" <pemaquidriver@tidewater.net> wrote in message
news:3B017E66.BD5C9F6D@tidewater.net...
> As single precision:
>
> IDL> CALDAT, 2529161.36, Month, Day, Year, Hour,
> Minute, Second
> IDL> PRINT, Month, Day, Year, Hour, Minute, Second
> 7 4 2212 18
> 0 0.00000000
>
> As double precision:
>
> IDL> CALDAT, 2529161.36d, Month, Day, Year, Hour,
> Minute, Second
> IDL> PRINT, Month, Day, Year, Hour, Minute, Second
> 7 4 2212 20
> 38 23.999989

I get the same results on my machine (which is not surprising as it's the same IDL version). But what about this:

CALDAT, double(2529161.36), Month, Day, Year, Hour, Minute, second
print, Month, Day, Year, Hour, Minute, second
; 7 4 2212 18 0
0.00000000

i.e. CALDAT gives the same result for double(2529161.36) as it does for 2529161.36.

If you look inside CALDAT you will see that there is no difference in the way it handles floats and doubles, and also that its constants are doubles and longs. So for most purposes a float argument is promoted to double in the calculation.

I suggest that there is nothing wrong with CALDAT, but that floats have inadequate precision to represent Julian dates. The following shows that they are only accurate to ~0.3 days.

ma = machar() & print, 2529161.36*ma.eps
; 0.301500

Mark Hadfield

m.hadfield@niwa.cri.nz http://katipo.niwa.cri.nz/~hadfield
National Institute for Water and Atmospheric Research

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Posted from clam.niwa.cri.nz [202.36.29.1]
via Mailgate.ORG Server - http://www.Mailgate.ORG

Subject: Re: CalDat
Posted by Martin Schultz on Wed, 16 May 2001 08:11:26 GMT
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m.hadfield@niwa.cri.nz ("Mark Hadfield") writes:

> But what about this:
>
> CALDAT, double(2529161.36), Month, Day, Year, Hour, Minute, second
> print, Month, Day, Year, Hour, Minute, second
> ;   7   4   2212   18   0
> 0.00000000
>
> i.e. CALDAT gives the same result for double(2529161.36) as it does for
> 2529161.36.

Well, of course it should. The number 2529161.36 cannot be accurately
represented as float. You can test this with
IDL> print,float(2529161.36d0),format='(f15.6)'
 2529161.250000

> I suggest that there is nothing wrong with CALDAT, but that floats have
> inadequate precision to represent Julian dates. The following shows that
> they are only accurate to ~0.3 days.
>
> ma = machar() & print, 2529161.36*ma.eps
> ;   0.301500
>

That hits the nail right on.

Martin

--
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Subject: Re: CalDat
Posted by Ben Tupper on Wed, 16 May 2001 15:48:56 GMT
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Thanks Mark and Martin,

I don't think the earlier discussion regarding float->double conversion had sunk in.

It would be nice if the documentation for CalDat made the behavior clear.

Ben

Martin Schultz wrote:

> m.hadfield@niwa.cri.nz ("Mark Hadfield") writes:
>
>> But what about this:
>>
>> CALDAT, double(2529161.36), Month, Day, Year, Hour, Minute, second
>> print, Month, Day, Year, Hour, Minute, second
>> ;   7   4   2212   18   0
>> 0.00000000
>>
>> i.e. CALDAT gives the same result for double(2529161.36) as it does for
>> 2529161.36.
>
> Well, of course it should. The number 2529161.36 cannot be accurately
> represented as float. You can test this with
> IDL> print,float(2529161.36d0),format='(f15.6)'
> 2529161.250000
>
>> I suggest that there is nothing wrong with CALDAT, but that floats have
>> inadequate precision to represent Julian dates. The following shows that
>> they are only accurate to ~0.3 days.
>>
>> ma = machar() & print, 2529161.36*ma.eps
>> ;   0.301500
>>
>
> That hits the nail right on.

>
> Martin
>
> --
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