Subject: Re: reading unformatted fortran
Posted by Nigel Wade on Mon, 13 Dec 1999 08:00:00 GMT
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Morwenna Grifiths wrote:
>
> I'm having difficulty reading unformatted fortran in IDL. I think I am
> doing just what the manual tells me to, but I assume I'm not! Here's a
> sample program.
>
> The fortran code to write the unformatted data:
> program write_out
> integer bb
> real aa
>
> write(6,*) 'in write_out now'
> open(unit=15,file='t1',form='unformatted',status='unknown')
> bb = 23
> write(15) bb
> close(unit=15)
>
> open(unit=16,file='t2',form='unformatted',status='unknown')
> aa=47.0
> write(16) aa
>
> close(unit=16)
>
> stop
> end
>
> The IDL code that doesn't work:
> a=1 & b=1 & c=1 & d=1 & e=1 & f=1 & aa=1.0
>
> openr,1,'t1',/f77_unformatted
> readu,1,a
> close,1
> print,'should be',a ; gives an answer of 0

Here you are reading a 16 bit integer from the file
rather than a 32 bit integer. IDL defaults to 16 bit
integers whereas IRIX defaults to 32bit (unless you are
running IRIX64). To get IDL to create a 32 bit integer
define a=1L.

>
> openr,1,'t1',f77_unformatted
> readu,1,a,b,c,d,e,f

> print,'but it is: ',a,b,c,d,e,f ; gives answers of 0 4 0 23 0 4, so the
> 4th number is correct
> close,1

Here you have read the file as plain binary (the f77_unformatted is
not a keyword, it is an argument as there is no /). So you read the file
as it was written by FORTRAN - here it has a 32 bit byte count followed
by the data followed by a trailing 32 bit byte count.

>
> openr,2,'t2',f77_unformatted
> readu,2,aa
> print,'real number ',aa ; gives an answer of 5.60519e-45, no idea why!
>

Here again, f77_unformatted is an argument not a keyword so IDL is not
reading FORTRAN data. It's loading the first 4 bytes (0x00000004), the
byte count, into the floating point value.

Change it to /f77_unformatted and you should get the 47.0 you expect.

> close,/all
>
> So it seems that IDL is reading some extra characters before and after
> the integer, and I have no idea what's happening with the real data.

Binary data is alway fun. Especially when it is created by FORTRAN.
AFAIK those byte counts at the start and end of the FORTRAN unformatted
records are implementation dependant - the FORTRAN standard leaves it up
to the compiler writers as to how they store unformatted data.
So you can't reliably transfer unformatted FORTRAN data from one machine
to another; maybe not even on the same machine if you have executables
created with different compilers.

>
> I'm running both the fortran and IDL on the same machine (a silicon
> graphics).
>
> Can anyone help me, please?

If you really have to read FORTRAN unformatted data into non-FORTRAN
programs be very careful.

>
> Morwenna

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