Subject: RFC 1: Common functions for beginners
Posted by Ed Wright on Wed, 14 May 2003 22:39:23 GMT
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To: IDL guri
From: Ed Wright

I have a request for comments (just like the IETF).

I learned the basics of IDL use and programming over a long time interval while writing the magnum opus of dlms. Rather than have new users repeat my learning process, I'd like your suggestions for the twenty or so most common IDL functions a new user should understand.

I mean most basic-most used. Open file, read numbers, plot numbers, write text, close file.

As always,
Ed Wright

Subject: Re: RFC 1: Common functions for beginners
Posted by Liam E. Gumley on Thu, 15 May 2003 16:12:57 GMT
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"Ed Wright" <ed.wright@jpl.nasa.gov> wrote in message
news:BAE813AB.B700%ed.wright@jpl.nasa.gov...
> To: IDL guri
> From: Ed Wright
>
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>
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> Ed Wright

Ed,

No doubt we can all come up with our twenty favorite IDL functions,

procedures, or statements that new users should understand. However it seems to me a bit like asking for my 20 favorite functions or statements in C, FORTRAN, Java, etc.

To get new users climbing the IDL learning curve quickly, I think it's much more effective to have them work through a good book on IDL programming. I'm told there are several decent titles available.

Cheers,
Liam.
Practical IDL Programming
http://www.gumley.com/

Subject: Re: RFC 1: Common functions for beginners
Posted by Matt Feinstein on Thu, 15 May 2003 17:37:28 GMT
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On Wed, 14 May 2003 15:39:23 -0700, Ed Wright <ed.wright@jpl.nasa.gov> wrote:

>
> To: IDL guri
> From: Ed Wright
>
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> As always,
> Ed Wright

Some things I learned the hard way:
0. The 'where am I' and 'what am I doing here' functions CD, ? , PRINT
1. Always use the /GET_LUN flag
2. How to write programs so they don't have to be explicitly compiled
3. How to use WINDOW, WSET, and the various interrelated coordinate systems
4. The sorting and searching functions-- WHERE, SORT, UNIQ

Matt Feinstein

--
The Law of Polarity: The probability of wiring a battery with
the correct polarity is (1/2)^N, where N is the number of times
you try to connect it.

Subject: Re: RFC 1: Common functions for beginners
Posted by Paul Van Delst[1] on Thu, 15 May 2003 18:04:38 GMT
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Matt Feinstein wrote:
>
> On Wed, 14 May 2003 15:39:23 -0700, Ed Wright <ed.wright@jpl.nasa.gov>
> wrote:
>
>>
>> To: IDL guri
>> From: Ed Wright
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>> As always,
>> Ed Wright
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> Some things I learned the hard way:
> 0. The 'where am I' and 'what am I doing here' functions CD, ? , PRINT
> 1. Always use the /GET_LUN flag

Since we're dealing with absolutes here, let me suggest a correction:
1. Always use the GET_LUN _procedure_

paulv

--
Paul van Delst
CIMSS @ NOAA/NCEP/EMC
Ph: (301)763-8000 x7748
Fax:(301)763-8545

Subject: Re: RFC 1: Common functions for beginners
Posted by David Fanning on Thu, 15 May 2003 18:13:53 GMT
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Paul van Delst (paul.vandelst@noaa.gov) writes:

> Since we're dealing with absolutes here, let me suggest a correction:
> 1. Always use the GET_LUN _procedure_

Truth be told, I'd forgotten there *was* a
GET_LUN procedure. :-(

Cheers,

David

--
David W. Fanning, Ph.D.
Fanning Software Consulting, Inc.
Phone: 970-221-0438, E-mail: david@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Toll-Free IDL Book Orders: 1-888-461-0155

Subject: Re: RFC 1: Common functions for beginners
Posted by Jeff Guerber on Fri, 16 May 2003 01:38:42 GMT
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On Wed, 14 May 2003, Ed Wright wrote:

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> text, close file.

1) Not really a function or procedure, but fundamental to making good use of IDL: Vectors, arrays, and operations on them, including in particular vector-vector, vector-array, and array-array operations, in addition to those involving scalars. Especially for those who cut their teeth on C or who haven't upgraded their Fortran compiler in 25 years! :-)
As a subtopic here, vector indexing and WHERE. (Someone mentioned SORT and UNIQ along with WHERE, but I find I use those _much_ less often.
Also, I think REBIN and HISTOGRAM, which Pavel mentioned, are much more advanced topics.)

2) PLOT. After all, it's pretty much IDL's raison d'... d'...
oh phooey... reason for existence!

3) _Correct_ use of AND, OR, and NOT in making logical comparisons. As bitwise operators, this isn't always obvious to the uninitiated.

4) On a somewhat more advanced level (so probably further down than #4 in the final list), pointers. Since IDL's pointer facility is so different from C's, it's something that users often find confusing when they first try them.

5) Something I've rarely seen discussed, but which might be a really good topic: When NOT to use IDL! Heretical as it may sound, it's not always the best choice... or even a good one. For example, I once had the misfortune to work on a project where we were archiving large quantities of data from Exabyte tapes onto video disks, doing various validations along the way. The Civil Servant in charge insisted on using IDL for the processing pipeline. There was no way it could keep up with the flood! A Fortran version I coded up ran in 1/2 to 2/3 the time, and he still wouldn't let me use it. Don't get me wrong, IDL's terrific for many things... but this wasn't one of them!

Jeff Guerber

Subject: Re: RFC 1: Common functions for beginners
Posted by Kelly Dean on Fri, 16 May 2003 18:09:39 GMT
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In my last job, I did alot of work with college students needing to learn IDL to do their class work. After reading the comments on this newsgroup I started writing some of my methods down that I used to get these students going.

There are two list I started, although they are incomplete right now. One list is for getting started and the other is for the students asking how to do this better, which were few and far between.

http://reef/atmos.colostate.edu/dean/IDL20tips.htm

Kelly Dean
CSU/ATS

Ed Wright wrote:

> To: IDL guri
> From: Ed Wright
>

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> As always,
> Ed Wright
>
>

Subject: Re: RFC 1: Common functions for beginners
Posted by Kelly Dean on Fri, 16 May 2003 18:21:34 GMT
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Opps! URL is mis-spelled. I haven't learn how to cut and paste in
Linux yet.

http://reef.atmos.colostate.edu/dean/IDL20tips.htm

Kelly

Kelly Dean wrote:

>
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> learn IDL to do their class work. After reading the comments on this
> newsgroup I started writing some of my methods down that I used to get
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>
>
> Kelly Dean
> CSU/ATS
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> Ed Wright wrote:
>
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Subject: Re: RFC 1: Common functions for beginners
Posted by condor on Mon, 19 May 2003 23:35:49 GMT
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Ed Wright <ed.wright@jpl.nasa.gov> wrote in message
news:<BAE813AB.B700%ed.wright@jpl.nasa.gov>...
> To: IDL guri
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>
> As always,
> Ed Wright

I think such alist would depend on the background of the user. Someone
mentioned that IDL counts from zero, which is important if you have a
fortran background but natural to someone who comes from C. (and could
go either way with someone who doesn't know any programming at all).

The 'format' for formatted output is trivial to the fortran guy, but will stump the C-programmer. etc.

I wonder why nobody has mentioned indgen/findgen yet.

I also don't think anybody has mentioned plotting into a PS device.

Someone needs to spell out that there's two "help-functions", one is called "?" and the other is called "help". Something like "help,!P,/struct" can tell you where to start looking for something or what to look for in the "?".

If people have any programming background at all, I'd hand them "begin...end" as the basic grouping tool and mention that "end" can often optionally be replaced with a more descriptive "endfor" or "endif" and such and that this should be done. (I spent a year or two blindly using 'if ... begin ... endif else begin ... endelse' without knowing why IDL syntax for 'else' was so screwy, until someone told me to think of the 'endif' and 'endelse' as 'end' and suddenly it's all fairly trivial).

Integers are 16 bit! "Loop limit expression too large". 'Nuff said.

Many people mentioned "where" and it should include ",/count" so that "if count gt 0 then ..."

The most common things in PLOT: psym=, thick=,
[xy]range=,/[xy]style,color=
  [xy]title= vs. title= vs. subtitle=

a = indgen(20) & a[0:10] = (b = (a[5:15] = indgen(11)*3)) & print,a
; etc

When to ignore error messages (like Floating errors and such)

a = b+c/d   ; if b,c and d are arrays of different dimensions.

Some word of warning about 'histogram'

I disagree that people need to know "device,decomposed=0" as this already presumes a certain color model. Instead I'd introduce to people the different color models and then direct them to something that works for their machine (Some students are being placed in front of a 5-year old Sparc box with 256 colors, some others have 24 (or even 32-bit displays...) PLUS Some method to get a few clear, well-known colors (red, green, blue, yellow) into their plot on screen and in PS

Just what comes to my mind...

Subject: Re: RFC 1: Common functions for beginners
Posted by Mark Hadfield on Tue, 20 May 2003 03:46:05 GMT
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"Big Bird" <condor@biosys.net> wrote in message
news:df160b8f.0305191535.214da775@posting.google.com...

> Integers are 16 bit! "Loop limit expression too large". 'Nuff said.

Not quite 'nuff:

```
  compile_opt DEFINT32
```

> I disagree that people need to know "device,decomposed=0" as this
> already presumes a certain color model.

Then I take it you won't mind David redirecting all email inquiries on this
subject to you?

--
Mark Hadfield "Ka puwaha te tai nei, Hoea tatou"
m.hadfield@niwa.co.nz
National Institute for Water and Atmospheric Research (NIWA)

Subject: Re: RFC 1: Common functions for beginners
Posted by David Fanning on Tue, 20 May 2003 03:58:43 GMT
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Mark Hadfield (m.hadfield@niwa.co.nz) writes:

>> I disagree that people need to know "device,decomposed=0" as this
>> already presumes a certain color model.
>
> Then I take it you won't mind David redirecting all email inquiries on this
> subject to you?

I've kept track. I've only answered the question 5,456,489 times!

Cheers,

David

--

David W. Fanning, Ph.D.
Fanning Software Consulting, Inc.
Phone: 970-221-0438, E-mail: david@dfanning.com
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Subject: Re: RFC 1: Common functions for beginners
Posted by condor on Tue, 20 May 2003 16:12:16 GMT
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"Mark Hadfield" <m.hadfield@niwa.co.nz> wrote in message
news:<bac8jd$4vp$1@newsreader.mailgate.org>...
> "Big Bird" <condor@biosys.net> wrote in message
> news:df160b8f.0305191535.214da775@posting.google.com...
>> I disagree that people need to know "device,decomposed=0" as this
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>
> Then I take it you won't mind David redirecting all email inquiries on this
> subject to you?

Heh - go ahead: all email to this account is automatically bounced to president@whitehouse.gov - clearly we need a national color model infrastructure... ;)

(Slightly more seriously: the OP was referring to things to teach to people he has sitting in front of him, not random people who send him emails because they can't get some program to work that was written in the early neolithic.)

ObIDL: maybe I understand device,decomposed=0 wrong, but it is really only useful if you have a true-color display (like every cheap PC these days!) and you're trying to use something that was written in the bad old days of 8-bit indexed color, right? (Wrong?)

I've come across these situations a few times; and so far the best choice was every time to go into the code and rewite it to expect a true-color display. I cannot imagine what economic upheavals would have to happen to make people go back to 8-bit pseudo color...

Subject: Re: RFC 1: Common functions for beginners
Posted by Matt Feinstein on Tue, 20 May 2003 16:28:51 GMT
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On 20 May 2003 09:12:16 -0700, condor@biosys.net (Big Bird) wrote:

> "Mark Hadfield" <m.hadfield@niwa.co.nz> wrote in message
news:<bac8jd$4vp$1@newsreader.mailgate.org>...
>> "Big Bird" <condor@biosys.net> wrote in message
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> choice was every time to go into the code and rewite it to expect a
> true-color display. I cannot imagine what economic upheavals would
> have to happen to make people go back to 8-bit pseudo color...

It's not so much a hardware issue as a question of how to display data
that comes to you compressed and encoded in pseudocolor-- there's a
performance penalty if you display it in 'true' color. But even in
that case, these days, you pay only a rather small penalty.

Matt Feinstein

--
The Law of Polarity: The probability of wiring a battery with
the correct polarity is (1/2)^N, where N is the number of times
you try to connect it.

Subject: Re: RFC 1: Common functions for beginners
Posted by James Kuyper on Tue, 20 May 2003 16:38:49 GMT

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Big Bird wrote:
...
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> choice was every time to go into the code and rewite it to expect a
> true-color display. I cannot imagine what economic upheavals would
> have to happen to make people go back to 8-bit pseudo color...

Some people never left 8-bit psuedo color. Neither of my two home machines have graphics cards which can do true color when running at the highest resolution the monitor can support. One of them has so little memory on the graphics card that I wouldn't dream of running it in true color mode (there's room for extra memory chips on that card, but it's been several years since it was possible to buy compatible chips for that card). I've used both machines to remotely log into work, and I've displayed IDL graphics on those monitors. I won't say it was easy: doing X-windows across a 56K connection is painfully slow. However, it did display properly, when I used the right IDL settings.

Subject: Re: RFC 1: Common functions for beginners
Posted by David Fanning on Tue, 20 May 2003 16:38:55 GMT
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Big Bird (condor@biosys.net) writes:

> (Slightly more seriously: the OP was referring to things to teach to
> people he has sitting in front of him, not random people who send him
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> the early neolithic.)
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> only useful if you have a true-color display (like every cheap PC
> these days!) and you're trying to use something that was written in
> the bad old days of 8-bit indexed color, right? (Wrong?)

Right. Like 95% of the programs living in your IDL directory structure. :-)

> I've come across these situations a few times; and so far the best
> choice was every time to go into the code and rewite it to expect a
> true-color display. I cannot imagine what economic upheavals would
> have to happen to make people go back to 8-bit pseudo color...

A few times!? I pretty much run into it constantly, and I go to GREAT effort to write programs in a device-independent fashion. If you are restricted to direct graphics for whatever

reason, there are some things you can't do EXCEPT with
DEVICE, DECOMPOSED=0. Filled contour plots come immediately
to mind. :-(

Cheers,

David
--
David W. Fanning, Ph.D.
Fanning Software Consulting, Inc.
Phone: 970-221-0438, E-mail: david@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com/
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Subject: Re: RFC 1: Common functions for beginners
Posted by David Fanning on Tue, 20 May 2003 16:42:51 GMT
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David Fanning (david@dfanning.com) writes:

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> I go to GREAT effort to write programs in a device-independent
> fashion. If you are restricted to direct graphics for whatever
> reason, there are some things you can't do EXCEPT with
> DEVICE, DECOMPOSED=0. Filled contour plots come immediately
> to mind. :-(

Whoops! I was so exercised I hit that Send button before
I was ready.

But what makes this *essential* to teach in the first
20 things you have to know, is that if you run into it
your first impression is that you have gone completely
crazy (It worked yesterday!!) instead of blaming the
stupid software for not being able to figure it out.

Cheers,

David
--
David W. Fanning, Ph.D.
Fanning Software Consulting, Inc.
Phone: 970-221-0438, E-mail: david@dfanning.com
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