Subject: IDL FAQ: beta release
Posted by pat on Tue, 16 Mar 1993 14:20:04 GMT
View Forum Message <> Reply to Message

Here is the beta version of the IDL FAQ.

A few notes:
 The history of RSI was incorrectly attributed. It was written by
Ali Bahrami.
 For the question of "How do I call routines in language X under
system Y?", I may make that a separate document. I have received several
excellent replies, each 300+ lines in length.
 Much to my amazement, there *is* an idl-mode of sorts (actually
wave-mode) for Emacs! Details below.
 The details of the RSI-PVI schism have been cleaned up.
 Format changed to make it easier to read the FAQ in am Emacs
buffer.

 I am, of course, still accepting questions, answer, corrections,
clarifications, etc. for the FAQ.

Archive-name:
Version: $Header: /home/pat/News/faq/RCS/idl-faq,v 0.4 1993/03/16 14:09:16 pat Exp pat $

A Note from the editor about PV~WAVE:

I do not have any direct experience with PV~WAVE. As such, I will try to
minimize comments which appear to favor one package or the other. I will,
however, welcome concise descriptions of technical and functional
differences between the two packages.

If you are viewing this text in a GNU Emacs Buffer, you can type
"M-2 C-x $" to get an overview of just the questions. Then, when you want
to look at the text of the answers, just type "C-x $".

 ==
GENERAL:

G1. What is IDL?

 IDL is the Interactive Data Language. It is is a product of

Research Systems, Inc. (RSI).

The following is quoted from the README file at rsinc.com:/pub/idl/README.
As such, it describes IDL's capabilities in an understandably subjective
manner. ;-)

{begin quote}
 IDL, Interactive Data analysis Language, is a
complete package for the interactive reduction, analysis,
and visualization of scientific data and images. Optimized
for the workstation environment, IDL integrates a responsive
array oriented language with numerous data analysis methods
and an extensive variety of two and three dimensional
displays into a powerful tool for researchers.

IDL supports an extensive data import capability,
 publication quality hard copy output, and user-defined Motif
 graphical user interfaces.

Users can create complex visualizations in hours
 instead of weeks with the aid of IDL's high level capabilities
 and interactive environment.

IDL is useful in physics, astronomy, image and
 signal processing, mapping, medical imaging, statistics,
 and other technical disciplines requiring visualization of
 large amounts of data.
 {end quote}

Here is a short history of RSI:
 [attributed to ali@rsinc.com (Ali Bahrami)]

{begin quote}
  IDL is a product of Research Systems, Inc., founded in 1977
  by David Stern. The origins of IDL were developed at the Laboratory
  for Atmospheric and Space Physics (LASP) at the University
  of Colorado. David was one of the people involved in efforts to
  make computers easier to use for the physicists at the Lab.
  The first program in the evolutionary chain to IDL was named Rufus
  (named after Dave's dog). Rufus was a very simple vector oriented
  calculator that ran on the PDP-12. It accepted 2 letter codes that
  specified (1) An arithmetic operation (2) The input registers to
  serve as operands, and (3) the destination register. The next version
  was the Mars Mariner Spectrum Editor (MMED) which was a version
  of Rufus that ran on the PDP-8.

  The next program in this line was named SOL, and it also ran on
  the PDP-8. Unlike its predecessors, SOL was a real computer language

with a real syntax (no more 2 letter codes). It was an APL influenced
array oriented language with some primitive graphics capabilities.
The resemblance to IDL was there, but very faintly.

In 1977, Dave left LASP to start Research Systems Inc. (RSI) with the
intention of building on the ideas contained in SOL. The initial
result of this endeavor was PDP-11 IDL, which was much more capable than
SOL. Graphics was usually done on Tektronix terminals and outboard
raster graphics displays. I used this version at LASP in 1981 on a
PDP11/34 under RSX-11M in 1981 (I worked as a student at LASP from
1981 to 1987). I didn't use it for very long though,
because 1981 was the year that Dave released the VAX/VMS version of
IDL. This version, which was written in VAX-11 MACRO and FORTRAN,
took advantage of the VAX virtual memory and 32-bit address space,
and was a huge step beyond the PDP-11 version. It used essentially
the same sort of graphics hardware as the PDP-11.

In 1987, Dave decided that Unix workstations were the direction in
which IDL should progress, but porting the current VAX IDL to Unix
didn't make much sense because of its MACRO and FORTRAN implementation.
I had just finished my Masters degree and was looking for work.
Dave hired me and together we wrote the current version of IDL for
Unix on the Sun 3 taking advantage of the re-write to extend and
improve the language. Since then, we've ported it to many Unix
machines as well as moving it back to VMS. We have more employees
now, but we're still developing and extending IDL as our sole product.
{end quote}

G2. Where can I contact them?

Their address is:

Research Systems, Inc.
777 29th Street, Suite 300
Boulder, CO 80303
(303) 786-9900   (Voice)

Email:
 info@rsinc.com or support@rsinc.com   # Internet
 ORION::IDL   # SPAN
 IDL@COLOLASP   # Bitnet

G3. How do I get IDL?

 RSI's distribution scheme is unique in that all of the
 binaries and IDL one needs are available via anonymous ftp.

IDL binaries and code are available at these sites:

gateway.rsinc.com (192.5.156.17)
  pub/idl
boulder.colorado.edu (128.138.240.1)
  pub/idl
lumpi.informatik.uni-dortmund.de (129.217.36.140)
  pub/idl

  The README file describes which files are needed, how to unpack
  them, and how to install them.
 If you install IDL without a valid license, you will
  get IDL's 7 minute demo mode. This mode is designed for users
  who are considering buying the package.
 To actually get IDL running for good, you must pay for
  a license from IDL and follow their instructions. You will be
  asked to fill out a form with information unique to your
  machine. IDL will create a license key which the license
  manager program (lmgrd) reads to validate your license.
 For more details, contact RSI.

G4. What is the current version of IDL?

 Version 3.0.0 is the current version. The next release
  is expected around May, 1993.

G5. On what systems does IDL run?

 The information below is from the file RELEASE_LEVEL
  located at rsinc.com:/pub/idl/RELEASE_LEVEL:

  {begin quote}
  This release supports the following systems:

 - Convex C2 and C3: ConvexOS 10.0.5.
 - Data General Aviion: DG/UX 5.4.1 and later
 - HP 9000: HP-UX 8.0 on Series 300, 400 and 700.
 - IBM 6000: AIX 3.2.
 - MIPS: Risc/OS 4.52B.
 - Risc Ultrix: Ultrix 4.2.
 - SGI: IRIX 4.0
 - Sun 3: SunOS 4.1.0. Widgets are built using OpenWindows 2.0.
 - Sun 4 (sparc): SunOS 4.1.0. Widgets are built using
   OpenWindows 3.0.
 - VAX/VMS: The standard release which does not include widgets
   requires VMS 5.1 or later. The version including widgets requires

VMS 5.4.
- DOS based personal computers running Microsoft Windows 3.1
{end quote}

Rumor has it that there is a version of IDL which runs on DEC
Alphas under OpenVMS 1.0.

G6. What is PV~WAVE and how is it related to IDL?

Around the time that the Unix version of IDL first became available
(1988), Precision Visuals Inc. (PVI) entered into an agreement with RSI
under which they enhanced and resold IDL under the name PV~WAVE. In
September of 1990, they exercised an option in that agreement that
resulted in the following:

- They received a copy of the IDL source code as it existed in
September 1990 in return for a one-time payment to RSI.

- The connection between RSI and PVI was severed.

IDL and PV~WAVE are now on separate development tracks. Each
company enhances, supports, and maintains its own product.

PVI has since merged with IMSL and is now Visual Numerics, Inc.
(VNI).

G7. Are there anonymous FTP sites for IDL?

The sites below contain public domain IDL code.

JHU/APL IDL library
fermi.jhuapl.edu [128.244.147.14]
/pub/idl-pvwave/jhuapl

NASA IDL Astronomy User's Library
idlastro.gsfc.nasa.gov [128.183.57.82]
/

IUE RDAF library
iuesn1.gsfc.nasa.gov [128.183.57.16]
cetus.colorado.edu [128.138.238.151]
/pub

ICUR Spectral Analysis Software
ftp.astro.psu.edu [128.118.147.28]

/pub/nefftp/icur

IDL ROSAT software
rosserv.gsfc.nasa.gov [128.183.8.43]
 /pub/IDL

IDLmeteo library
ftp.sma.ch (141.249.3.33)
 /pub/idlmeteo

G8. How can I get help?

 RSI has excellent telephone support. You can contact them at:

 (303) 786-9900   (Voice)
 (303) 786-9909   (Fax)

      Email:
 info@rsinc.com or support@rsinc.com   # Internet
 ORION::IDL   # SPAN
 IDL@COLOLASP   # Bitnet

 Keep in mind, however, that their phone support is primarily for
 their paying customers.

G9. Why are there two newsgroups for IDL?

 Unfortunately, there are two very different packages
    with the abbreviation "IDL". The newsgroup comp.lang.idl
    is for the Interface Description Language. The newsgroup
    for discussing issues related to RSI's IDL and PV~WAVE is
    comp.lang.idl-pvwave.

 ==
TECHNICAL QUESTIONS:

Note for Sun users:

There is a mini FAQ for Sun IDL in $IDL_DIR/notes, and the following
questions are answered in the file openwin3.doc:
(1) IDL complains about missing fonts when creating widgets.
(2) IDL complains about missing bitmap files when creating widgets.
(3) How to make IDL work with OpenWindows version 3.0.
(4) 3-D appearance for OpenLook IDLwidgets.
(5) Why does one of the widgets appear red?

(6) Why does pressing the left button while pointing at a pulldown
   menu button cause the menu to pop up with the pushpin in?
   Older versions of IDL didn't to that.
(7) The font used by the list widget is much larger than it used to
   be, and I don't like the result on my program.
(8) Why do I get "Cannot allocate colormap entry" errors, and why do
   they kill IDL?
(9) I've changed my .Xdefaults file, but nothing different happened. Why?

T1. Why doesn't polycontour fill open contours?

 This problem is described in the POLYCONTOUR manual page.

 {begin quote}
 RESTRICTIONS:
 This routine will NOT draw open contours. To eliminate open
 contours in your dataset, surround the original array with a 1-element
 border on all sides. The border should be set to a value less than
 or equal to the minimum data array value.

 For example, if A is an (N,M) array enter:

 B = REPLICATE(MIN(A), N+2, M+2) ;Make background
 B(1,1) = A   ;Insert original data
 CONTOUR, B, PATH=Filename ... ;Create the contour file.
 {end quote}

 Sources at RSI tell me that efforts to fix this problem have
 been given a high priority. In the next release, expect a new
 parameter to CONTOUR which will automatically draw filled
 contours, closed and open.

T2. How do I increase the number of commands stored in the
 history buffer?

 The system variable !EDIT_INPUT controls command recall. By
 default, it is set to 1, causing the last 20 commands to be saved. If it
 is 0, no commands are saved. To save more than 20 commands, just put
 !EDIT_INPUT=50 (or other large number) in your startup file.

T3. How do I get IDL to call routines in language X, running
 under system Y?

 [this question still under construction]

T4. Why does XPALETTE edit my color table incorrectly?

 [this question still under construction]

T5. Is there on-line help for IDL?

 Try ?.

T6. I run IDL under X in SunOS 4.x, and after I logout, the screen
  becomes completely blank. Typing in login names and passwords 'blindly'
  logs you in again with the 'correct' colors. How to prevent this?

 Add the following to your .Xdefaults:

 Idl*colors: -5

 which reserves some colors for the colormap so that IDL does not exhaust
  all the available colors. (For a nice summary of Sun IDL interactions
  with OpenWindows, see $IDL_DIR/notes/openwin3.doc)

 Another solution is to put a call to clear_colormap in your .login
  file to be executed after OpenWindows start up.

T7. Sometimes my variables seem to disappear. Why is this?

 Quoting the IDL User's Guide, page 10-8:

 {begin quote}
 IDL users may find that all their variables have seemingly disappeared
  after an error occurs inside a procedure or function. The misunderstood
  subtlety is that after the error occurs, IDL's context is inside the called
  procedure, not in the main level. Typing RETALL or RETURN will make the
  lost variables reappear.

 RETALL is best suited for use when an error is detected in a procedure and
  it is desired to return immediately to the main program level despite
  nested procedure calls. RETALL issues RETURN commands until the main
  program level is reached.

 The HELP command can be used to see the current call stack (i.e., which
  program unit IDL is in and which program unit called it).
 {end quote}

T8. Is there a major mode for editing IDL code in Emacs?

 No and yes.

PV-Wave has developed a PV-Wave major mode, which they have made
available under the FSF copyleft. Given the (remaining) strong similarity
between Wave and IDL, it has many of the features that one would like in
such a mode.
It is available by anonymous ftp from ftp.pvi.com (128.138.213.22) in
the ./PVI/emacs directory

T9. How do I get 3-D widgets under OpenLook 3.0?

This subject is discussed on page 53 of the OpenWindows Version 3
User's Guide Release Manual.

OpenWindows 3.0 added 3-D appearance for widgets. In order for
the 3-D look to work, it must be enabled and the background color
must be a medium tone color such as "grey" or "wheat".
Add the following resources to your ~/.Xdefaults file:

For plain IDL:

Idl*threeD: TRUE
Idl*background: PeachPuff2

For IMSL/IDL:
Imslidl*threeD: TRUE
Imslidl*background: PeachPuff2

T10. Why does one of the widgets appear red under OpenWindows?

This subject is discussed on page 53 of the OpenWindows Version 3
User's Guide Release Manual.

The OLIT widget toolkit, which is used by IDL, added the
concept of "mouseless focus" under version 3.0. The red widget
indicates where the current mouseless focus is. Use the arrow keys
to traverse the widgets, and the spacebar to make a selection.

T11. Where are all the IDL routines and userlib procedures?

The basic routines are not accessible, for obvious reasons. The userlib,
statlib and widget procedures are in $IDL_DIR/lib/. The procedure XDL also
displays the full pathname. The system variable !path also contains the
directory names for all accessible IDL procedures.

T12. Does anybody know how to put multiple image plots on one page in
PostScript?

Because PostScript has scalable pixels, you must specify the xsize and
ysize parameters, as well as the position parameter, in TV or TVSCL.
I don't know about PV-Wave, but the following works in IDL:

```
; Display four images in a 2x2 grid
; Assume data(x,y,4) = array containing the 4 images

set_plot, 'ps'          ;request PostScript output
device, ...             ;modify page size, orientation, etc. as desired
ximsize = 0.5*!d.x_size  ;define output image size
yimsize = 0.5*!d.y_size  ;note: 0.5 assumes 2x2 grid
for i=0,3 do begin       ;display the 4 images, using i as position index
  tv, data(*,*,i), i, xsize=ximsize, ysize=yimsize
endfor
```

T13. Does case matter in IDL?

No, but yes. All variable names (including system variables) are case
insensitive. But routines compiled via .run ARE case sensitive, but
once they are compiled, case sensitivity disappears. Does anyone
know what is happening here?

==

Disclaimer:

I do not work for RSI and I am in no way answerable to them. Questions and
answers in this document are culled from the user community. No warranty,
express or implied exists regarding this document. Permission to copy all
or part of this work is granted, provided that the copies are not made or
distributed for resale.

This file can always be found at jaameri.gsfc.nasa.gov [128.183.88.75]
in pub/idl/idl-faq.

Additions and corrections should be sent to:

pat@jaameri.gsfc.nasa.gov (patrick m. ryan)

Many thanks to the following for their contributions.

black@breeze.rsre.mod.uk (John Black)
edelsohn@npac.syr.edu (David Edelsohn)
fireman@iuegtc.DNET.NASA.GOV (Gwyn Fireman)

gurman@umbra.gsfc.nasa.gov (Joseph B. Gurman)
jdlb@kukui.IFA.Hawaii.Edu (JF Pitot de La Beaujardiere)
kashyap@oddjob.uchicago.edu (Vinay Kashyap)
oet@maz.sma.ch (Thomas Oettli)
rmmoss@Texaco.COM (Robert M. Moss)
sterne@dublin.llnl.gov (Philip Sterne)

--
patrick m. ryan
nasa / goddard space flight center / oceans and ice branch / hughes stx
pat@jaameri.gsfc.nasa.gov / zmpmr@charney.gsfc.nasa.gov