Brief Intoduction to IDL

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IDL (Interactive Data Language)

1. What is IDL?
2. Basic Commands
3. Programming in IDL
4. Plotting
5. ULySS software for Astronomical Spectroscopy

What is IDL?

Produced & sold by Research Systems Inc., Colorado.

• Acronym for Interactive Data Language.

• High-level language designed specifically for scientific programming & data analysis.

• Array based language

• Interactivity and graphics display.

• Runs under a variety of operating system (Ubuntu,

Windows).

Basic Commands

- How to run IDL?

  Interactively (IDLDE): type "IDLDE" on command prompt.

  Using Command line: Type "IDL" on command prompt.

- Defining a variable: Type on IDL prompt "a=5.0"

- Insensitive to uppercase or lowercase letters.

- Printing output: "Print, 2*4"/ Print, variable name

- Generating array: indgen, findgen.....

- Checking variable type: help variable_name

- Array(matrix) manipulation: detterm, transpose, inverse

Basic Commands

- Accessing any element of an array: print[2,4] prints the element of an array from 3rd column & 5th row.

- Accessing a data file: openr, openw, openu, readcol

- Writing data to a file: writef, forprint

- Looping structure: for do, while do

  for do structure: FOR Variable=sta_value,end_value,inc DO (begin) Statement (end for)

  while do structure: WHILE expression DO statement

- Online help: ?help

- Exiting IDL: exit

Programming in IDL

Three primary types of IDL programs

- Batch files: contains one or more executable command, can include the statements of some other program.

- Main-Level programs: don't want to creat a separate file

- Named programs: procedures & functions

  Procedure: A self-contained sequence of IDL statements with a unique mane; performs a well defined task.

  Functions: same as procedure, but returns a value.

- Compilation: system rotines are compiled automatically

Programming in IDL

- User defined functions are compiled in three ways:

  Automatically: if found in IDL's path and has a name similar to system routine.

  Interactively: from the DE window RUN>compile.

  Manually: .compile, .run

- Example: Function to calculate the area of a circle.

  Compiling Batch files.

  Using "readcol", "print", "forprint"..etc

Programming in IDL

Three basic types of routines

- Procedure: performs a well defined task

- Functions: performs a well define task and returns a value

- Executive Commands: control the exectution

Parameters accepted by IDL routine:

- Argumnets: to pass the information to/fro from IDL routine

  supplied in ordered way, may be optional

- Keywords: Always optional, no ordering

Plotting

- Plotting command

Plot, [X,] Y [, /ISOTROPIC] [, MAX_VALUE=value] [, MIN_VALUE=value] [, NSUM=value] [, /POLAR] [, THICK=value] [, /XLOG] [, /YLOG] [, /YNOZERO]

with graphic keywords

[, BACKGROUND=color_index] [, CHARSIZE=value] [, CHARTHICK=integer] [, CLIP=[X0, Y0, X1, Y1]] [, COLOR=value] [, /DATA | , /DEVICE | , /NORMAL] [, FONT=integer] [, LINESTYLE={0 | 1 | 2 | 3 | 4 | 5}] [, /NOCLIP] [, /NODATA] [, /NOERASE] [, POSITION=[X0, Y0, X1, Y1]] [, PSYM=integer{0 to 10}] [, SUBTITLE=string] [, SYMSIZE=value] [, /T3D] [, THICK=value] [, TICKLEN=value] [, TITLE=string]

UlySS (University of Lyon Spectr. Software)

- http://ulyss.univ-lyon1.fr/

- ULySS (University of Lyon Spectroscopic analysis Software) is an open-source software package written in the GDL/IDL language to analyse astronomical data.

- ULySS fits a spectrum with a linear combination of non-linear components convolved with a line-of-sight velocity distribution (LOSVD) and multiplied by a polynomial continuum.

- ULySS is used to study stellar populations of galaxies and star clusters and atmospheric parameters of stars.

- For tutorials and examples: http://ulyss.univ-lyon1.fr/tuto_base.html

Thanks