Spectral Data Analysis with IDL

Getting into IDL:
1. Log in to a Linux machine and open a terminal window.
2. If logging in remotely, you can use: ssh -p 2998 -XY user@astro.gsu.edu
   (to place or retrieve files you can use: sftp -P 2998 user@astro.gsu.edu)
3. Start up the IUE version of IDL:
   source /usr/local/idl_lib/iuerdaf/operations/iueidl_setup.sh

IDL facts:
   IDL is a programming language that is good for graphics applications. One can run individual commands from the prompt, or create a procedure (i.e., program) that runs a bunch of commands. Software for analysis of UV and optical spectra has been written at Goddard Space Flight Center for analysis of IUE, GHRS, and STIS spectra. To run a procedure, you type its name and arguments, separated by commas:
IDL> procedure,argument1, argument2, …   (IDL> is the prompt)

   IDL allows the manipulation of arrays (including one-dimensional arrays called "vectors") directly, without the need for DO loops. For example, one can store the wavelengths of a spectrum in a vector called "w1" and the fluxes in a vector called "f1". Note that the IDL convention is such that the first number in a vector starts at element number 0. For example, one could have a flux vector with 1024 elements, which would be stored in f1(0), f1(1), … f1(1023). To average two flux vectors f1 and f2 together (must be the same number of elements!), you would type:
IDL>f=(f1+f2)/2.

Common IDL commands:
1. .run goofy   (compile procedure goofy.pro that you have written)
2. help (display current vectors and compiled procedures)
3. retall   (return to main level, usually after a procedure has bombed)
4. close,/all (close all open files, usually run in conjunction with retall)
5. print,w(0) (print first element of w)
6. plot,w,f   (plot wavelength vs. flux)
7. $ (spawn out of IDL; e.g., $ls)
8. save,w,f,filename='spectrum.dat' (save vectors in IDL save file)
9. restore,'spectrum.dat'   (restore vectors in file spectrum.dat)

Common IUE IDL commands:
1. plot,w,f,xrange=[1500,2500],yrange=[0,5.0e-13]
2. point,w,f   (determine positions with a cursor)
3. feature,w,f,w0 (measure flux, centroid, EW of emission or absorption line)
(w and f are vectors, w0 is a number – approximate wavelength of feature)
4. doc_library,'procedure' (get information on an IUE procedure)

To generate a hard copy of a plot:
1. set_plot.'ps'
2. device,/landscape
3. plot,w,f
4. device,/close_file
5. set_plot,'x'
6. $gv idl.ps