

JAS in SDA

My Experience

- My assignment was to use JAS to read SDA data and make plots.
 - I used OSDA and OSDAphysics to read SDA data.
 - OSDA and OSDAphysics are Java libraries to extract archived SDA data from stores.

IDEs

- The JAS IDE is minimalistic but functional.
 - The editing environment is Notepad-like.
 - The compiler shows sufficient, but not detailed, error messages, and has no debugger.
 - JAS has no program-killing button.

IDEs cont.

- JAS and JBuilder
 - The JAS IDE was not efficient enough for me to develop programs.
 - I used JBuilder instead. It has these features which JAS does not:
 - Real-time compiling
 - Syntax-specific colored text
 - A debug mode

IDEs cont.

- Compatibility
 - JBuilder is compatible with JAS except for a few differences:
 - The indentations in JBuilder are different than in JAS.
 - There are specific packages required for JBuilder to be able to compile and execute JAS or JAIDA programs.
 - This info was hard to find. It is presently in the JAS3 release notes.

JAIDA

- JAIDA: A Java version of AIDA
 - AIDA is an efficient and easy-to-use data interface. Once the syntax has been learned, it is easy to manipulate data and create plots.
 - JAIDA allows OSDA and AIDA to coexist in the same program.
 - A single program can take data from OSDA, store it in an ITuple, and use the IPlotter to generate plots.
 - An example of a JAIDA-generated plot is in the Shot Scrapbook:
<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=scrap03&action=view&page=342&scroll=false&load=no>

JAIDA cont.

- JAIDA's missing elements:
 - Support for multiple axes in the Plotter
 - This will be implemented in the next release of JAIDA.
 - Support for multiple data styles
 - This is supposed to be already there; I was not able to understand it.

JAS Interactive Plotter

- The interactive plotter is what makes JAS the most useful analysis tool I have used.
- The plotter allows users to take AIDA ITuples and make plots in real-time.
 - The Tuple format allows one-click plots to be made that already have labels and statistics.
 - Real-time histogram rebinning is integrated.
 - During talks, plots being shown in the presentation can be recreated quickly.
 - The Supertable is a good example.
 - The data ITuple must be already on disk.

Interactive Plotter cont.

- There are a few limitations:
 - The cuts are specified by a Java syntax.
 - Is this documented somewhere?
 - Can any mathematical function be used?
 - Names of the columns in the Tuples must be without spaces, or the cuts won't work. However, names with spaces don't cause any errors before this step.
 - The plotter will not recognize two ITuples with the same length.
 - It should be possible to plot two data sets of the same size, no matter what ITuple they come from.
 - The plotter automatically assigns random colors and shapes to data points.
 - Sometimes the plots seem invisible.
 - Reformatting the plots every time becomes tedious.
 - This should be customizable.

Conclusions

- JAS has lots of potential. If we commit to the program, we can develop a seamless interface for users to gather and analyze data.
 - A key feature of JAS that allows this is plugins.
 - We could write a Fermi-specific GUI plugin that would allow users to choose what SDA data they want, and the data could then be acquired within the program. The user would only see an ITuple containing the data, which could then be manipulated.

Conclusions cont.

- Some specific issues should be resolved before I think we can really consider committing to JAS:
 - JAIDA and the SDA firewall are not friends.
 - The memory cleanup in JAS seems to be a problem.
 - A garbage collect button may fix the problem.
 - Another possible solution is more efficient code.
- The JAS IDE could use improvement.
 - If the development environment is made more efficient, JAS could become a one-stop-shop for JAIDA development.