My switch from Windows to Linux:

Corwin D. Smidt

September 30, 2008

Ongoing; will be updated

In my line of research I do some statistical work in R/Stata/NumPy/SciPy, computer programming in Python and Perl, and most of my word processing in LaTeX. I am also Emacs-centric in my use of these programs.

Listed below were some of my experiences in getting things working and optimized for me when I switched to (X)ubuntu. Since I am a Linux newbie I am not certain whether my process was optimal – in fact I am certain it was suboptimal. So if any one out there has better suggestions or notices some mistakes please give me an email.

Linux version: Xubuntu 8.04
Processor: Intel Core2 Quad CPU @ 2.83 GHz

Perfunctory Things

I assume you have downloaded R, Emacs, and the texlive packages from your distribution's package manager. I also like the emacs-goodies-el package, since I prefer the high contrast color themes. Dark background, white type is both good for your eyes and it saves energy.

LaTeX

One thing I realized is that my understanding of LaTeX, AucTeX, RefTeX, BibTeX, and Emacs was totally screwed up in Windows. Let me go through how things work.

- Emacs is your text editor - that's it. It has certain style files, indenting rules, and macros that make it modify how .tex, .bib, and other files are displayed and your ability to insert text.

- AucTeX modifies Emacs so certain commands and macros can be called and run from within Emacs. For instance, C-c C-c calls texlive to run latex (or pdflatex depending on your settings) on your document. To compile TeX documents within Emacs you need AucTeX, otherwise you need to use the Terminal.

- RefTeX is a convenient add-on to Emacs that is pre-installed and helps you search and manage your citations, tables, references, and lists. To enable RefTeX make sure you include the relevant commands in your `.emacs` file in your home drive.

```
;; Reftex
(autoload 'reftex-mode    "reftex" "RefTeX Minor Mode" t)
(autoload 'turn-on-reftex "reftex" "RefTeX Minor Mode" t)
(add-hook 'LaTeX-mode-hook 'turn-on-reftex) ; with AUCTeX LaTeX mode
;  (add-hook 'latex-mode-hook 'turn-on-reftex)) ; with Emacs latex mode
(setq reftex-enable-partial-scans t)
(setq reftex-save-parse-info t)
(setq reftex-use-multiple-selection-buffers t)
;; To integrate with AUCTeX, use
   (setq reftex-plug-into-AUCTeX t)
```

Specifying your Central Bibliography File

I work with a master bibliography folder which I use to cite within all my documents. As a result, I want Emacs to tell AucTeX to go find that master BibTeX file each time I run BibTeX from any folder.

You do that by specifying the BIBINPUTS environment so it references the directory/folder where your .bib file is (you could also save your .bib file in some default directory, but I think it makes sense to keep your .bib file with your actual documents, not in some tex library.)

In Xubuntu add this to your .profile document changing "/tex" to whatever directory you desire:

```
if [ -d "$HOME/tex" ] ; then
```

```
   export BIBINPUTS="$BIBINPUTS:$HOME/tex"
fi
```

Setting up Stata (version 10):

Installation

The installation directions were clear enough from Stata, but only the Terminal version of Stata (stata) worked out of the box.

The X-window version (xstata) did not however. My problem with the dynamic version of xstata was that it searched for an old TIFF library. Stata's website gives you three different options for addressing this problem. The Linux people I talked to seemed to prefer the third for this problem (since it is only a graphing library): simply create a symbolic link to the new library. If you have this problem with another library you might want to install the static version of Stata. You can do this with the following command:

```
ln -s /usr/lib/libtiff.so.4 /usr/lib/libtiff.so.3
```

Modifications

A modification that you will most likely want is to grant write privileges to the following folders/files:

> `/.xstata` - for saving windowing preferences in your personal home directory. Not that big of deal.
>
> `/usr/local/stata10` - for allowing downloadable updates from your X-windows sessions. Otherwise you have to run stata10 as root from the Terminal and then type out the update commands. The command gives all users write access to the whole stata10 directory. Since I'm the only user on my box, I find this setup less worrisome than logging in as root and accidently doing something stupid.

To do this, from the terminal in your home directory type

```
sudo chmod a+w .xstata
```

for the first and

```
sudo chmod a+w stata10
```

in your `/usr/local/` folder for the second.

Getting R setup in X/K/Ubuntu

The instructions are fairly clear on `http://cran.r-project.org/bin/linux/ubuntu/`.

You most likely will get an error, and need to get a key added. Scroll down the webpage and follow the instructions under "SECURE APT."

This website is very helpful: `http://wiki.r-project.org/rwiki/doku.php?id=getting-started:installation:debian`

Getting R Optimized

Have a dual/quad/multi-core machine? Then your R (or programs like NumPy) isn't optimized out of the box, at least in Ubuntu. With a Pentium you have a number of options for quicker matrix computations.

1. ATLAS - is a package that optimizes your BLAS (Basic Linear Algebra System) and there is a Debian/Ubuntu package available to install. It is by far the simplest way to get your R faster. The `libatlas3gf-base` will work on most systems, but is slower. The `libatlas3gf-sse2` version (works on Pentium 4 and up) calculated matrix crossproducts twice as fast on my computer.

2. Goto BLAS - Programmed by Kazushige Goto, the code is apparently faster than the ATLAS implementation. However, you have to register, compile, and install it yourself. For more on this see `http://cran.r-project.org/doc/manuals/R-admin.html#BLAS`

3. Intel also offers a free Linux version of their Math Kernel Library. I haven't compared it to the ATLAS or Goto times.