LaTeX , BibTeX , and Friends

Robert Buels

Outline

- What is LaTeX
- Using LaTeX
- Using BibTeX
- LyX – the graphical LaTeX
- Managing your BibTeX references
- Further reading

Pronunciation

TEX : tech

- Properly: like loch in “Loch Ness” or ach in “Ach, du lieber!”
- I just say tech like technology. Close enough and easier.

LATEX : lay-tech or lah-tech

BibTEX : bib-tech

LYX : licks

This is how Leslie Lamport said to say these things. [4]

LaTeX Philosophy

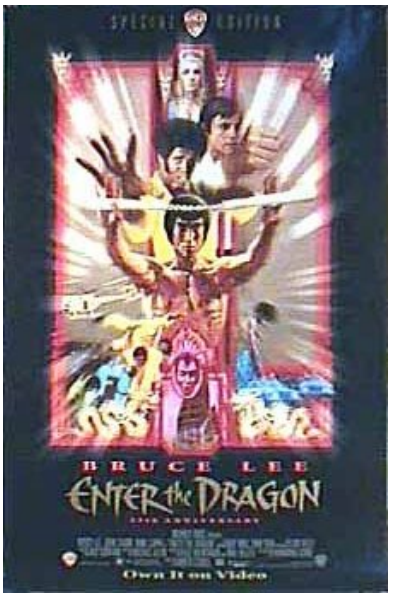
- Authors write their work in ASCII text files with LaTeX markup that indicates bulleted lists, chapter divisions, etc.
- Run these files through the LaTeX system to generate some kind of output.
  - Postscript (`.ps`), PDF
  - HTML
  - RTF - Rich Text Format (for Microsoft ®Word®, Wordpad®, etc.)
  - Unix MAN format
- **Result:** when writing, author concentrates on the *structure* of the document, not the formatting.

LaTeX History

- In the beginning (the 70s) was TeX .
  - Written by Donald Knuth to typeset his new book *The Art of Computer Programming*.
  - A markup language (like HTML and XML), aimed at typesetting text and mathematical formulas.
  - Designed to run on any platform. Unix, Linux, Windows, Mac, whatever.
  - Famously stable and almost entirely bug-free. Version number converging to π, currently at 3.14159.
  - Too low-level for everyday use – you need to specify every single little thing.
- Enter LaTeX , a (large) set of TeX macros by Leslie Lamport.

Enter the LaTeX

- Powerful macros for making and using templates to automate most of the work at various levels
  - Whole document (article, report, book, ...)
  - Medium-sized structures (framed boxes, block quotes, math formulas)
  - Small things (emphasized text, example code, paragraph breaks)
- Of course, LaTeX comes with default templates for all of these. These produce the distinctive "LaTeX look".
- Many many add-on packages available to extend functionality.



Typical LaTeX Usage

- Write. Maybe a lot.

```
rob@toblerone$ emacs latex_presentation.tex
```

- Preview the output.

```
rob@toblerone$ pdflatex latex_presentation.tex
pdflatex: <...blahblahblah generate stuff blahblahblah...>
! LaTeX Error: \begin{slide} on input line 118 ended
by \end{center}.
```

- Slap forehead.

```
rob@toblerone$ emacs latex_presentation.tex
rob@toblerone$ pdflatex latex_presentation.tex
pdflatex: <...blahblahblah everything's fine blahblahblah...>
```

- Really preview the output.

```
rob@toblerone$ acroread latex_presentation.tex
```

Typical LaTeX Usage, continued

- Tweak the formatting a little.

```
rob@toblerone$ emacs latex_presentation.tex
rob@toblerone$ pdflatex latex_presentation.tex
rob@toblerone$ acroread latex_presentation.tex
```

- Give a talk for the Cornell Genomics Forum.

Your mileage may vary.

Strengths of LaTeX

Superior Typographic Quality Widely agreed to be much better at typesetting than any WYSIWYG word processor. For math formulas, the gap is even wider.

Programmatic Features Write your own macros. Save time and impress your friends.

Longevity LaTeX documents written 10 years ago look pretty much the same today. Compare this to the planned obsolescence of Word documents.

Structure! Authors concentrate on the *structure* of their work, not the details of formatting.

Plain Text Files Similarity to programming means you can use many of the same tools! (Makefiles, Perl scripts, CVS/Subversion, etc.)

Weaknesses of LaTeX

Learning Curve

- More moving parts - text editor, LaTeX program, viewers for produced output.
- Your LaTeX code must be syntactically correct
- Have to remember markup commands.
- Amounts to a steep learning curve for non-programmers.

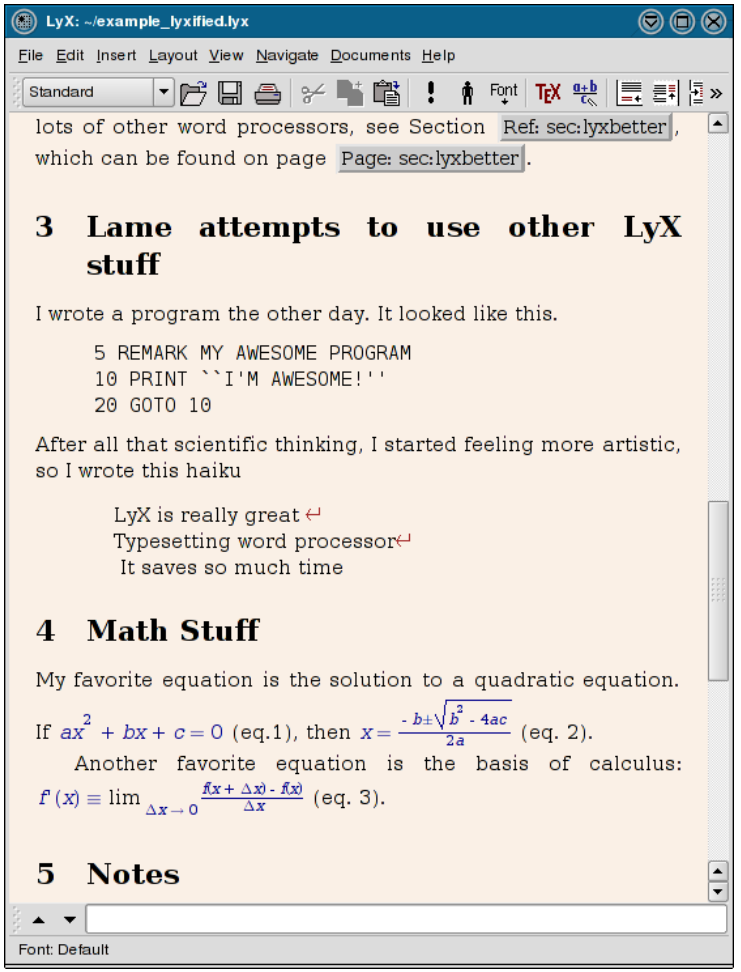
Other

- Not the best choice for things that are free-form and very graphical.
- Constructing a new document format template can be a lot of work!

Fortunately for non-coders, we have LyX .

LyX , the Graphical LaTeX

- Completely graphical (no coding), much easier for non-programmers to learn.
- LyX still manages to stay true to the LaTeX ideal of formatting following automatically from structure.
- Really available on all Unix-like things (including Mac OS X), sort of available on Windows.
- Web site: `http://www.lyx.org`



What is BibTeX

BibTeX autogenerates references and associated bibliographies for TeX and LaTeX documents.

1. Keep all your references in a BibTeX -format database.
2. Run LaTeX once, takes note of any dangling `\cite` references.
3. Run BibTeX to fill them in and generate the contents of the bibliography.
4. Run LaTeX to typeset the new references and bibliography along with the rest of the document.

```
emacs latex_presentation.tex
pdflatex latex_presentation.tex
bibtex latex_presentation
pdflatex latex_presentation
acroread latex_presentation.pdf
```

BibTeX Reference Managers

All Platforms

JabRef: java. Very nice and full-featured. My favorite. [1]

BibManager: java. Good categorizing system. [5]

SixPack: perl/tk. Many input/output formats. [3]

tkbibtex: tcl/tk. Small, simple and fast. [2]

Linux (and OS X?)

gbib: GTK+. Simple and fast. Has a Debian package.

Pybliographer: Python/GTK. Has a Debian package.

Windows

EndNote: using a custom style file, can export in BibTeX format. [6]

BibDB

BibTeXMng

BibEdit: streamlined editor for BibTeX files.

BibTeX Managers Demo

Now let’s play with a few GUI reference managers.

Translating Between EndNote and BibTeX

EndNote → BibTeX

EndNote can be made to export in BibTeX format by downloading a BibTeX style file from the EndNote site at `http://www.endnote.com/help/ENStyles.htm`

BibTeX → EndNote

Create a LaTeX document that uses a specific BibTeX reference style definition[6], and EndNote will be able to import it.

Both Directions

SixPack[3] can read and write both EndNote and BibTeX database formats. Open as one and save as the other.

Translating Between Word and LaTeX

- The ugly truth: conversion is very difficult.
- LaTeX and Word (and the like) are just too different.
- The following is a digest of the material at:
  `http://www.tug.org/utilities/texconv/index.html`

LaTeX → Word

- Two categories of solutions for importing into Word
- **Intermediate Format**
  - Convert LaTeX to RTF using latex2rtf, then import that with Word
  - Use TeX4ht to convert to HTML and then import that into Word.
  - Oddly: can make a PDF, convert that to RTF with BCLDrake (commercial), and import THAT into Word.
- **Directly into Word**
  - Use TeX2Word, a shareware import filter for MS Word
  - Use TexPort, a commercial converter. Can also do WordPerfect.
  - Word macros tex2doc(can attempt tables) and ltx2word(no tables).
- Once again, find all of this at:
  `http://www.tug.org/utilities/texconv/index.html`

Word → LaTeX

- **From within Word**
  - Word macros winw2ltx and MathType(commercial).
  - Word export filter Word2TeX(shareware), fairly well-developed.
  - Export as HTML with a special add-on export module (*Not the default one!*)
- **From Word `.doc` Files**
  - Open `.doc` with AbiWord and save as LaTeX .
  - `LAOLA` can extract just the text.
  - `word2x` can convert Word 95 documents.
  - `antiword` can convert up to Word 2000 documents to plain text or Postscript.
- **From RTF** (exported by Word), can read in with `rtf2latex2e`
- Once again, find all of this at:
  `http://www.tug.org/utilities/texconv/index.html`

Bibliography

References

[1] Morten Alver and Nizar Batada. Jabref. WWW Page, December 2004. http://jabref.sourceforge.net/.

[2] Peter Corke. tkbibtex - a portable tcl/tk browser/editor for bibtex files. WWW Page, December 2004. http://www.cat.csiro.au/cmst/staff/pic/tkbibtex.html.

[3] Michael Lachmann. Sixpack - bibliography and reference manager. WWW Page, December 2004. http://www.santafe.edu/~dirk/sixpack/.

[4] Leslie Lamport. *LaTeX: A Document Preparation System*. Addison-Wesley, Reading, MA, 2nd edition, 1994.

[5] Yee Wei Law. Bibtex manager. WWW Page, December 2004. http://wwwhome.cs.utwente.nl/~ywlaw/bibman.php.

[6] Rob MacLeod. Using endnote with latex/bibtex. WWW Page, December 2004. http://www.cvrti.utah.edu/~macleod/litbase/endnote.html.