

Introductory L^AT_EX Tutorial

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For the tutorial, please copy these files into your home directory:

```
cp /home/dowty/example.tex .
cp /home/dowty/example.bib .
cp /home/dowty/tree-macros.sty .
```

1 WHAT IS IT?

LaTeX is a high-level document formatting system which is especially good when a high level of precision is required, e.g., for logical formulas or tree diagrams. It is implemented as a set of macros and style definitions based on the typographical processing language “TeX”. A LaTeX file is a plain text file (ASCII) which contains text and a number of (LaTeX) commands that tell the processor how to format that text.

2 WHAT’S IN IT FOR ME?

- LaTeX allows a fairly elegant handling of example numbering, cross-references, trees, formulas, bibliographic databases, etc.
- The output is typographically very sophisticated, e.g. gives a typesetter’s exact spacing and font changes in headers, formulas, numbered examples, etc. Latex documents can be and are used directly by some printers of journals and books.
- The typographical niceties are usually handled automatically; the user only needs to specify the “logical structure” of the document, and latex does the rest.
- Latex can easily be extended in unlimited ways, and one user can use another’s extensions: special extension “packages” have already been created for almost every imaginable typographical problem that arises in linguistics, e.g. all kinds of trees, semantic formulas, IPA symbols, linguistic examples with aligned glosses, and many non-western alphabets. Packages exist that provide exact formatting for *Language*-style bibliographies, other journals’ style sheets, OSU dissertations, etc. Also, it’s easy to create your own extensions, command abbreviations, etc.

- LaTeX is widely used: any UNIX system anywhere in the world will have latex installed. Within linguistics, latex is the most commonly used text formatter in syntax, semantics, computational linguistics, and mathematical linguistics. A number of OSU linguistics students and faculty members use latex, so it's easy to get help.

3 STEPS IN USING LATEX

There are three basic steps in creating a latex document:

1. Write/edit your latex document, e.g. `example.tex`, using a text editor such as emacs. Any text editor can be used, so long as it can produce a pure text (ascii) file. (All latex commands are written in plain text (ascii).)
2. Run `latex` on your document; this will produce a dvi (DeVice Independent) file, e.g. `example.dvi`.
3. EITHER view the formatted output in a window, using `xdvi`.
4. OR/AND use `dvips` to convert the .dvi file to postscript and print it out.

There are two ways to process these steps. The “hard way” is to use the command-line in a terminal, the easy way is to take advantage of emacs’s latex (and auctex) mode and run these commands within emacs.

1. create document using emacs (latex/auctex mode)

command-line:	emacs latex/auctex-mode:
2. <code>latex example.tex</code>	C-c C-c Latex
3. <code>xdvi example.dvi</code>	C-c C-c View
4. <code>dvips -Pprinter200 example.dvi</code>	C-c C-c Print

(Other processes such as BibTeX and trees require additional steps.) You can shorten the latex-mode commands by using command completion, e.g. C-C C-c 1[TAB] to run latex.

When latex is run, it produces a series of messages about its progress, including error messages, that are valuable for debugging your document. In emacs/auctex, typing C-` moves your cursor to the point in your document where the error occurred (well, approximately where it occurred) and show you latex’s error message for it.

Many people find that the easiest way to write, debug and check latex documents is to open an xdvi window next to the emacs window in which you’re creating your document, so that you can repeatedly view the new output as you add to your document.

4 BIBTEX

There are a number of ways to include bibliographical references in your document. The most widely used system is BibTeX.

To use the automatic bibliography-creating feature of latex, called *BibTeX*, you do four things: (1) create a bibliographic database, with complete entries for each item, (2) as you write your document, use the `\cite` command to put citations in your text, and at the end, add a `\bibliography`

command to tell latex where the bibliography should go and what database should be used. Then (3) after you have run latex on your document, run BibTeX, then (4) run LaTeX two more times.

BibTeX files have entries with explicit fields for different parts of the bibliographical information. An example for a book entry is the following:

```
@book{NNP:94,  
  title      = "German in Head-Driven Phrase Structure Grammar",  
  editor     = "John Nerbonne and Klaus Netter and Carl Pollard",  
  address    = "Stanford",  
  publisher  = "CSLI",  
  series     = "Lecture Note Series",  
  number    = "46",  
  year      = "1994"  
}
```

This would have to be contained in a bibliographical database with a bib extension, for instance: 'my-refs.bib'

In order to refer to this particular entry in a document, you would have to include the following command: `\cite{NNP:94}`

In the final output, this will produce a bibliographical reference such as (Nerbonne et al. 1994) in the text with a full entry in the bibliography. To make this happen, you will have to tell latex where to look for the bibliographical database to be considered by including a pointer to the bibliography:

```
\bibliography{my-refs}
```

The place where this command occurs in the document determines the where the references will be listed. Note that the bibliography has to be in the same directory. Otherwise you have to supply a pathname.

You also need to tell latex the formatting style for the bibliography via '`\bibliographystyle`', for instance

```
\bibliographystyle{lsalike}
```

The advantage of BibTeX is that it allows you to keep a single bibliography database around, from which different lists of references can be produced depending on the citations that actually occur in your papers. ONCE YOU MAKE AN ENTRY FOR AN ITEM, YOU WILL NEVER HAVE TO TYPE IT AGAIN, NO MATTER HOW MANY PAPERS YOU USE IT IN!

5 L^AT_EX DOCUMENTATION

5.1 ON-LINE DOCUMENTATION

There are several versions of latex documentation on line, though none are as complete and useful as the hard-copy latex books (see below).

<http://www.ling.ohio-state.edu/local/support/Docs/latex/ltx-2.html>

(or, <http://ling.osu.edu/~i> Internal Information [~i](http://ling.osu.edu/~i) System Support Page [~i](http://ling.osu.edu/~i) Help with Latex)

<http://tex.loria.fr/general/latex2e.html>

5.2 HARD-COPY MANUALS

If you use LaTeX a lot, you will probably want to buy a hard-copy manual. The best one seems to be *A Guide to LaTeX* by Kopka and Daly (Kopka 1999). A book that includes descriptions of many, many packages for extending LaTeX is (Goossens 1993).

REFERENCES

GOOSSENS, MICHEL. 1993. *The LaTeX companion*. Addison-Wesley.

KOPKA, HELMUT. 1999. *A Guide to LaTeX*. Addison-Wesley, 3 edition.