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Administrivia

- Notes from last time updated/expanded and posted.
- More links for TEX and friends added to "Useful links" page.

Slide 2

Minute Essay From Last Lecture

- Question: What text editor do you currently use under Linux? What do you like/dislike about it?
- Answers mostly mentioned `vi(m)`.

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What are TEX and LATEX?

- TEX — program for typesetting mathematics, developed by Knuth (1978) for his book *The Art of Computer Programming* and made freely available.
- LATEX — extensive set of macros for TEX written by Lamport (1985), that provide functionality needed for scholarly papers. Extended over the years by many people.
- These are "text formatters" not "word processors", and as such don't include a built-in editor.
- Basic idea — you write "source code" for your document (text and markup) with a text editor, then use TEX or LATEX to turn it into a formatted document.
- Both available in zero-cost form for many platforms. Included in complete Linux distributions (as far as I know).

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Basics (Under Unix)

- You write "source" (`foo.tex`) with a text editor — includes your text plus "logical markup" — e.g., `\section{A Section Heading}`.
- You use the command `latex` to generate a `.dvi` file, then `dvips` to generate PostScript, then (if desired) convert to PDF with `ps2pdf`.
  (Supposedly you can also go directly to PDF with `pdflatex`. I haven't tried it.)
- There are also several tools to convert to HTML. I use `latex2html`, but there are others.

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Isn't That a Lot of Trouble?

- In some ways, yes. There is a learning curve, and there are many "gotchas".
- But those who persevere get:
  - Very nice-looking output (math in particular looks great).
  - Facilities for cross-referencing, bibliographic references, footnotes, tables of contents, etc., built in, and usually they "just work".
  - Stable documents — the only way to "corrupt" a document is to mess up with your text editor. Very old documents usually still compile, and if they don't the text is still accessible.
  - Once you figure out how to do a particular trick, it's there in the `.tex` source for future reference.

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Basics, Continued

- LaTeX provides a small set of "document classes" — article, report, book, etc. These classes group definitions for section headers, lists, etc., supposedly in a way that everything looks good together. Also can have "packages" that group together related customizations, provide extra features.
- Basic document structure (look at example):
  - `\documentclass[options]{foo}`
  - Additional global definitions, packages, etc.
  - `\begin{document}`
  - Your text. "Paragraphs" continue until first blank line.
  - `\end{document}`

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Some Features

- "Sectioning commands" provide consistent layout and automatic numbering. Also collects info to make table of contents.
- "Environments" provide support for lists, tabular forms, centered text, "verbatim" (equivalent of HTML preformatted text).
- Other macros provide simple markup, e.g., `\textit{foo}`.
- Math — a bit cryptic, but IMO not worse than point-and-click equation editor. Support for numbered equations.

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More Features

- Graphics in EPS form can be included (and scaled). I use `xfig` to draw pictures — old, but nice integration with LaTeX. There are other tools.
- Figures and tables can "float" (put them where they fit).
- Lots of cross-referencing features — declare symbolic label (for section, figure, etc.) with `\label{foo}`, reference with `\ref{foo}`. Also footnotes.
- Support for bibliography / list of references — usually use companion package BibTeX.
- Support for indexes and glossaries.
- Facilities to define your own "commands" and "environments". Makes it easy to get consistent formatting; also allows shorthand.

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Gotchas

- Some characters have special meaning and must be "escaped": backslash, brackets, #, %, $<$, $>$, $|$, caret (^), underscore (_), tilde (~).
- Quotation marks should be entered as ``` ``foo'' ```. Dashes should be entered as `--` or `---`.

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Advice For Getting Started

- Get hold of an example that looks somewhat similar to what you want to produce, plus some sort of documentation — a guide from online or a book.
- Tinker with the example, putting in your prose and other stuff.
- When something doesn't work, ask a local expert.

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Minute Essay

- What do you currently use to produce formatted documents? What do you like/dislike about it?