LaTeX for Beginners

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Why LaTeX?

- *No* typesetting system formats mathematics better than LaTeX

$$f\left(x\right)=\frac{1-x^2}{\sqrt[3]{1-x^3}}\left[\phi_k^{(2)}(x-x_0)+\Gamma(\bar{x})\right]$$ Word

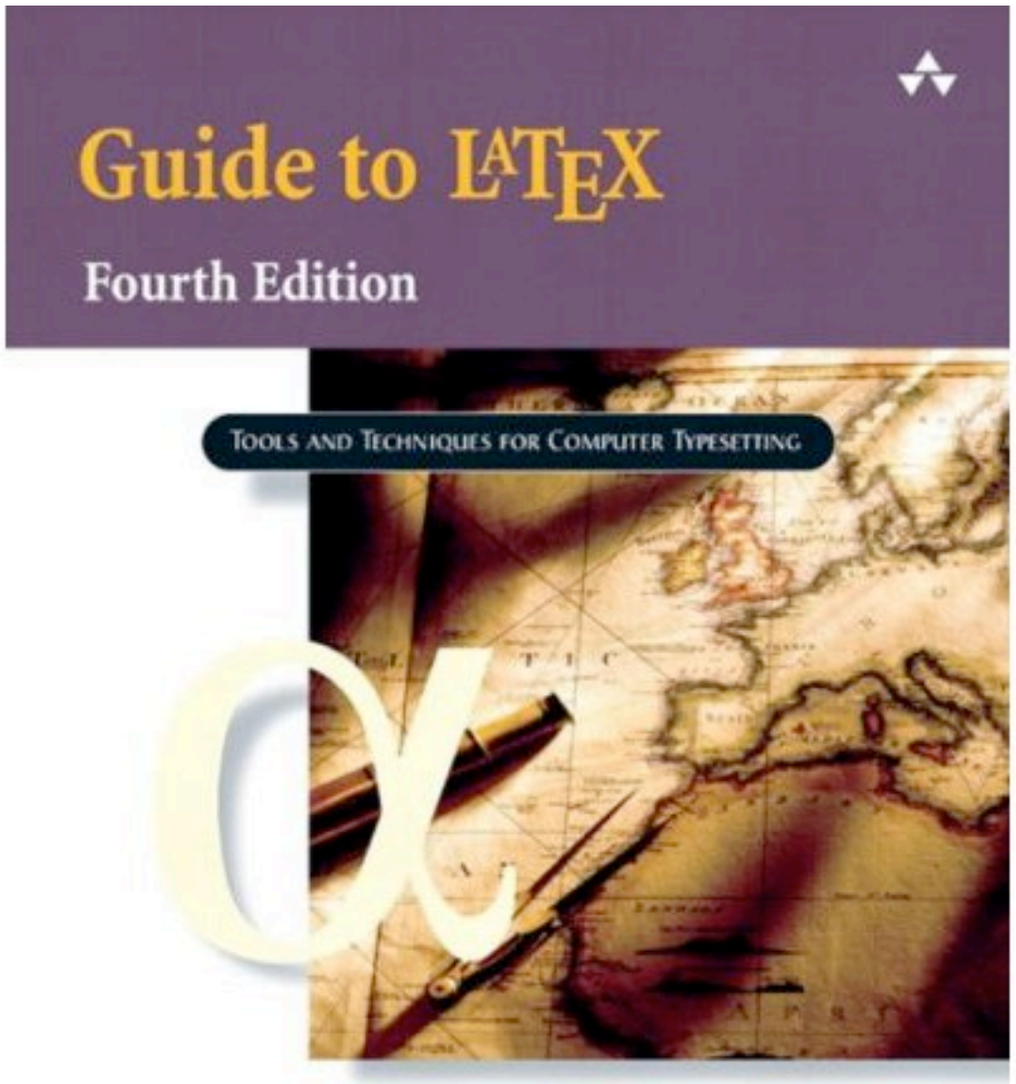
$$f(x)=\frac{1-x^2}{\sqrt[3]{1-x^3}}\left[\phi_k^{(2)}(x-x_0)+\Gamma(\bar{x})\right]$$ LaTeX

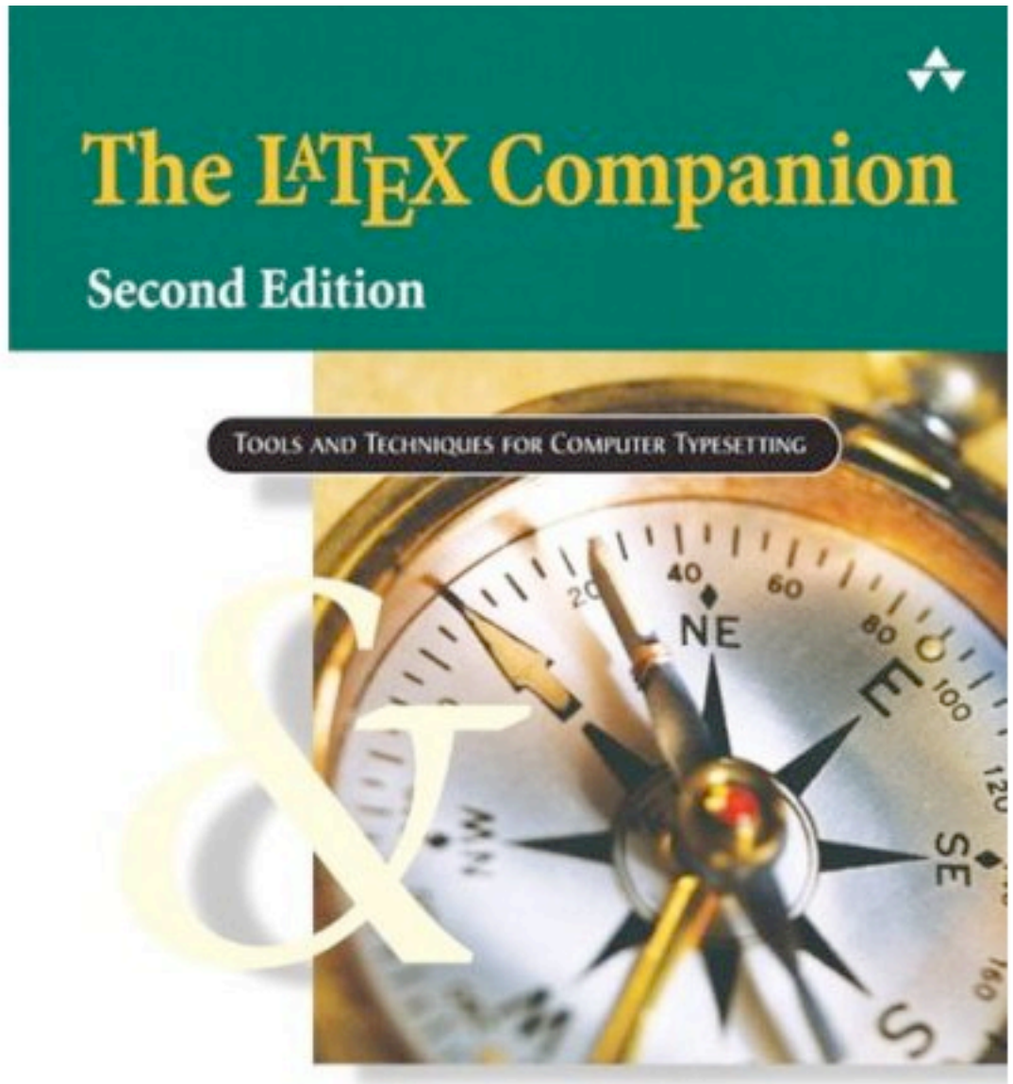
- And there are even more advantages!
  - ★ symbolic references
  - ★ extensible
  - ★ definable environments (theorems)
  - ★ portable (text based)

LaTeX

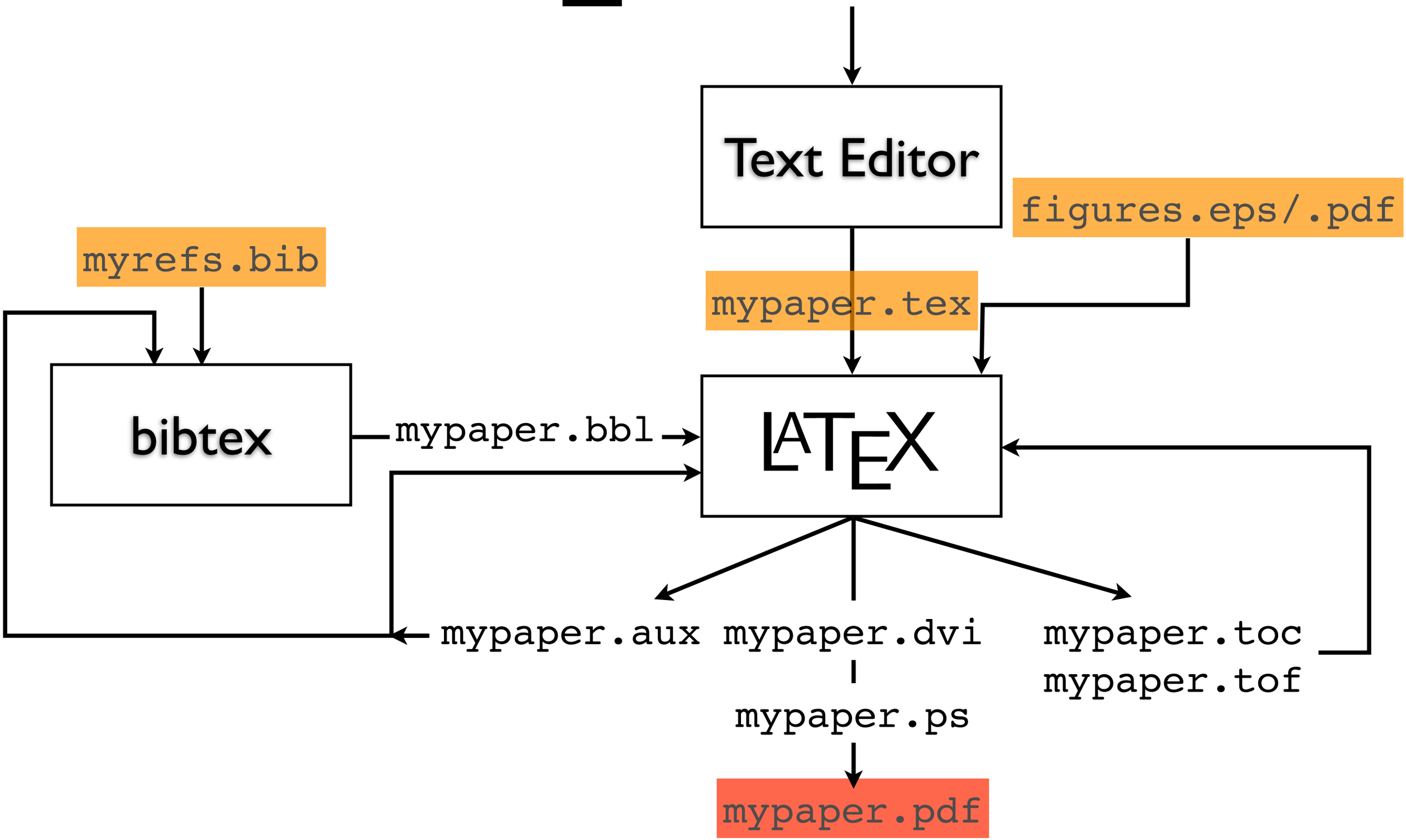
- LaTeX is, at its heart, a set of macros that ease the interface to TeX
- LaTeX incorporates *packages* to extend its capabilities beyond the LaTeX standard (LaTeX 2e)

up-to-date information





LaTeX Workflow



Special characters

- Some keyboard characters are reserved

  \ { } # $ % & ~ _ ^

- **All** LaTeX commands and (almost) all entities begin with \
- “{“ and “}” are used for grouping
- Each special character can have its special status removed by preceding it with a \ (for example, \{)

simple1.tex

- Working with a LaTeX environment shell
- Input file
- LaTeX output messages
- Output pdf
- Basic mathematics and formatting
- “\sloppy”
- Defining your own notation

simple2.tex

- Using packages
  - ★ Changing to space-efficient (and prettier?) Times-Roman font
  - ★ Incorporate AMS extensions
- Make page wider and taller

simple3.tex

- Adding sections
- Adding labels and referring to them
- “\renewcommand”
- Footnotes
- Itemized lists

simple4.tex

- Bibliographies
- Author-year and numeric versions
- Sorted and unsorted bibliographies
- Table of contents

simple5.tex

- Two-column formatting for conference papers
- Coping with different bibliography styles
- Introduction to “floats”: tables

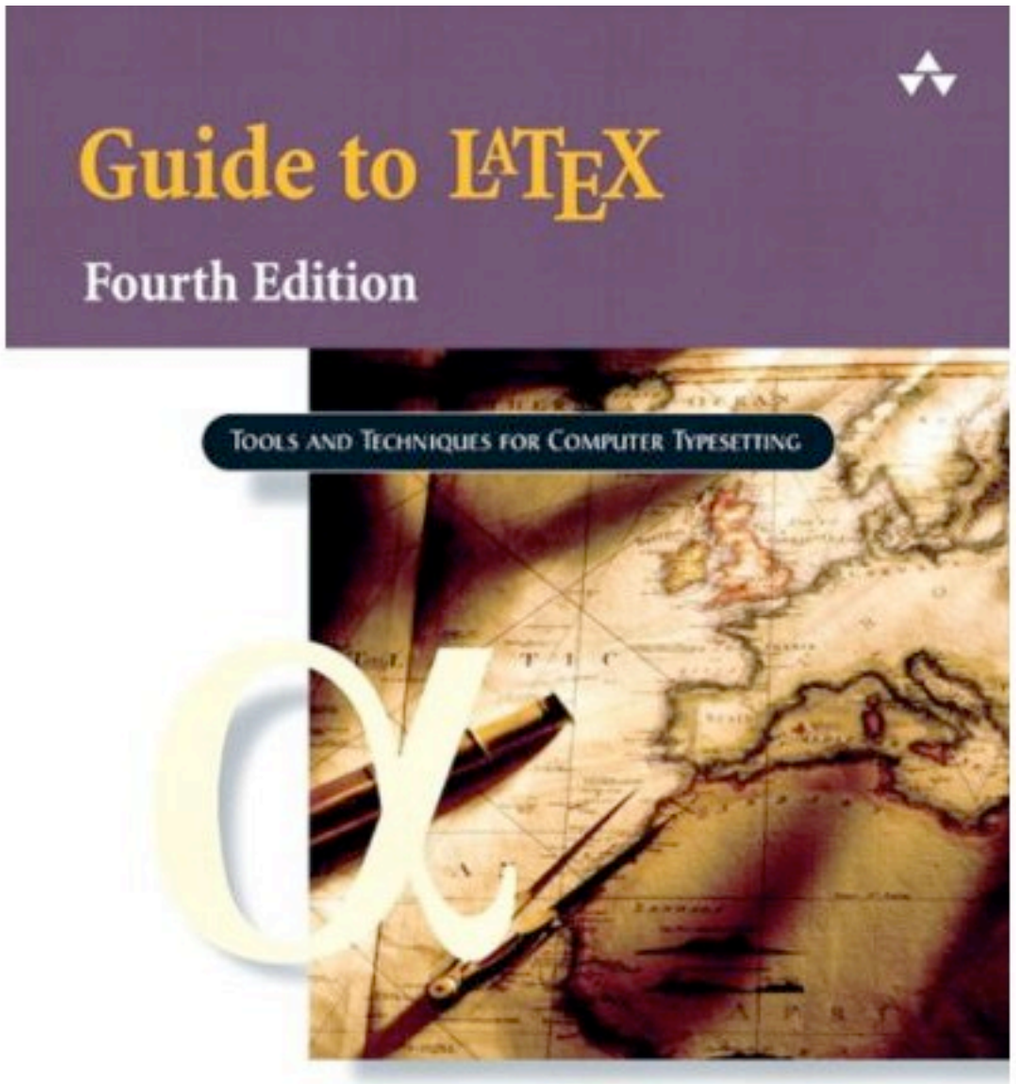
Summary

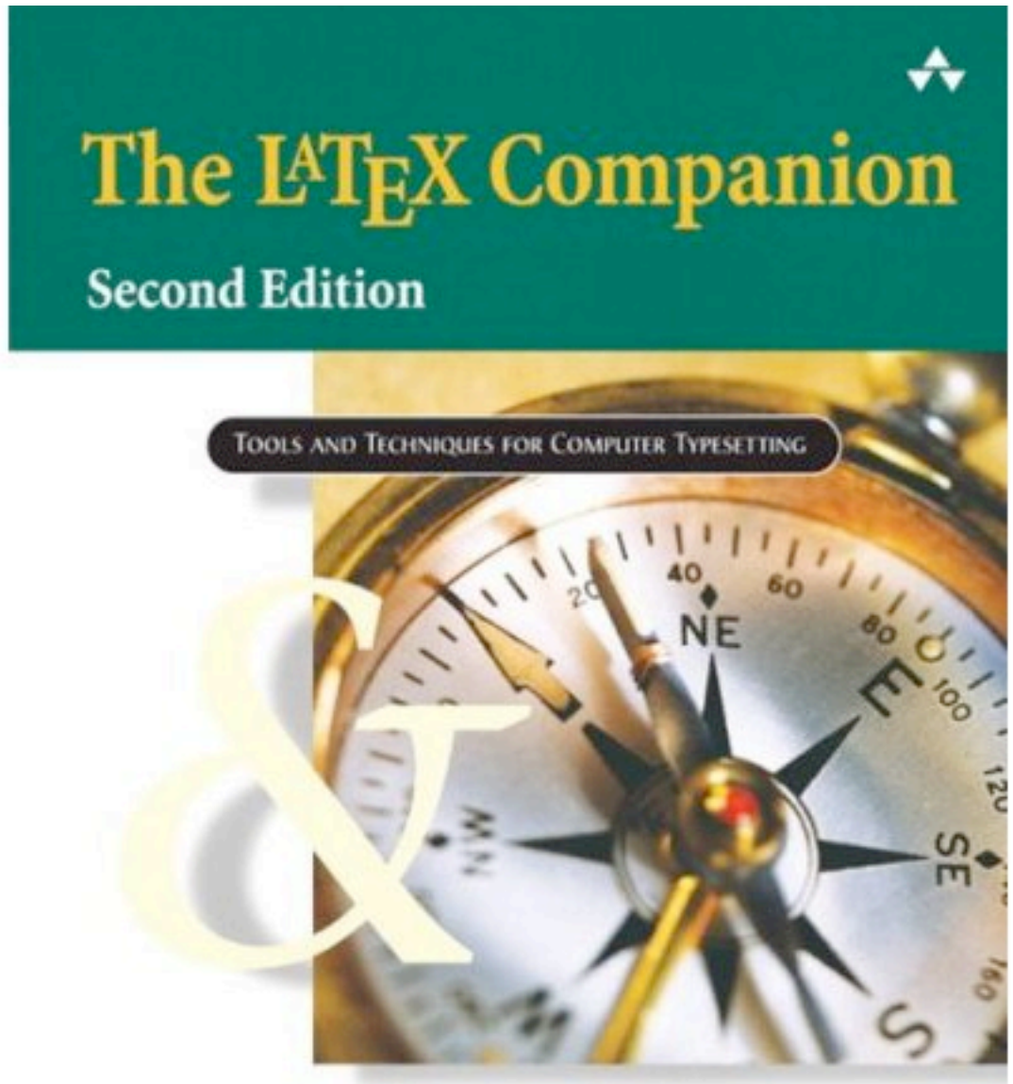
- LaTeX enables production of well-typeset documents
- *Nothing* typesets mathematics better
- More to come…
  - ★ Advanced mathematics
  - ★ Figures
  - ★ Modifying LaTeX

Intermediate LaTeX

- Assume you know the basics
  - ★ Simple mathematics (calculus)
  - ★ Tables and floats
  - ★ \section, \ref, \pageref, \newcommand
  - ★ bibliographies
- Onward!

up-to-date information





simple6.tex

- Simple document
- Seeing the page layout

advanced1.tex

- Uncommon mathematical symbols
- `case` statements

advanced2.tex

- Aligning equations
- Two-sided output

advanced3.tex

- Conditional formatting

advanced4.tex

- Figures
- Subfigures
- Formatting captions

advanced5.tex

- Wrapping text around figures

advanced6.tex

- Loooong tables

Special-Purpose Packages

- Chemical formulae (advancedchem.tex)
- Computer algorithms and listings (advancedcomp.tex)

Into the dark side…
advanced7.tex

- Modifying LaTeX's macros

What else?