

A HOWTO on Producing and Promoting an Open Source Mathematics Textbook

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Introduction

Ben Crowell, author of the open source *Light and Matter* textbook says:

Who am I and why should you trust me to tell you about science?

A First Course in Linear Algebra

a first course in

Linear Algebra



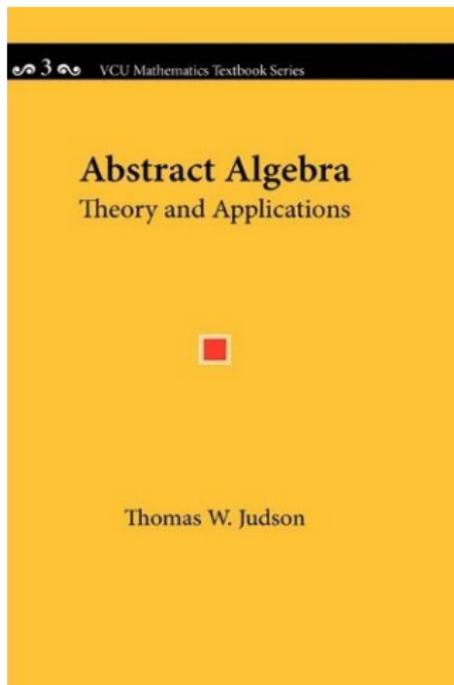
Robert A. Beezer
Socia Edition (v1.0)

- Version 1.0, December 2006
- Used at 20 or more universities
- `linear.pugetsound.edu`
Over 940,000 page views
- #4 result in Google search for “linear algebra”
- Multiple formats:
PDF, web, tablets, print-on-demand
- Worldwide audience

200 visitors, 24 hours on a recent weekend
(12:02:41 25 Feb 2012 to 12:44:46 26 February, 2012)



Abstract Algebra: Theory and Applications



- Author: Tom Judson
- Commercial offering, early 90's
- Released as open-source
February 2009
- Comparable to Gallian's
Contemporary Abstract Algebra
- Used at 30 or more universities
- #6 result in Google search for
"abstract algebra"
- `abstract.pugetsound.edu`
Over 180,000 page views

DIY

- Good News: You can Do It Yourself
- Content
- Typography (\LaTeX , etc)
- Cover Design
- Sales (Print-on-Demand, PayPal)

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- Good News: You can Do It Yourself
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- Bad News: You will need to Do It Yourself

Authoring Content

- Use off-the-shelf \LaTeX
- Use macros liberally
- Try not to think of printed page
- Targets may be HTML, e-books
- Numbering, References
- Structured \LaTeX
 - End of a subsection?
 - Mimic XML

```
\begin{chap}{Matrices}
  \begin{sect}{Eigenvalues}
    \begin{para}
      This section discusses..
    \end{para}
    \begin{subsect}{Multiplicity}
      \begin{para}
        This subsection discusses..
      \end{para}
    \end{subsect}
  \end{sect}
\end{chap}
```

Grow Your Text

- I have not yet missed a deadline
- Update on whatever schedule you like
- Teach whatever you are writing
 - Linear Algebra, 14 sections
 - Abstract Algebra, 3 years
- Student misconceptions suggest text, exercises
- Capture classroom improvisations
- Exercises
 - Exam questions become homework exercises
 - WebWork National Problem Library
 - Contributions from colleagues

Licenses

- Decide early about a license
- It is a promise, a statement of intent
- Not so much about reuse
- Popular choices
 - GNU Free Documentation License
 - Creative Commons
 - No Derivatives (ND)?
 - Non Commercial (NC)?
- I will not commit to a “free to download” text

Targets

- PDF s*cks
 - Printed page, books: an established technology
 - Tempting to use \LaTeX doo-dads
 - Footnotes, index
 - Equation-breaking
- HTML via Tex4ht
 - An amazing tool
 - Very finicky
 - Long-term support?
- HTML via DocBook XML, MathJax
 - DocBook not designed for mathematics
 - MathJax is very promising (Javascript library)
- Sage Notebooks
 - $\LaTeX \Rightarrow \text{Tex4ht} \Rightarrow \text{Python} \Rightarrow \text{Web Browser}$

Proofreading

- Numerous corrections from total strangers
- *Your* students are your most reliable editors
- A small monetary reward goes a long way

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v2.31 2012//

New: Exercise HSE.T11, equivalent systems, both homogeneous, or both not (Robert Beezer)
New: Exercise SSLE.M14, 'time flies like...' (Gary Gordon)
Typo: Extra "a" in Section V0 (Aaron Taylor)
Typo: a/the Example LINSB (Zeke Rosenberg)
Typo: "see" missing from Solution LDS.C50 (Aaron Taylor)
Typo: "of" missing from Subsection MISLE.MI (Zeke Rosenberg)
Typo: Exercise and Solution SS.M12 needs set brackets in spans (Cliff Berger)
Typo: Proof of Theorem NI has bad reference to Theorem NMRRI (Troy Cornelius)
Typo: Adjusted subsection acronym to FS.CCS (Troy Cornelius)
Typo: Solution MO.C13, $\alpha = 2$ (Preston Van Buren)
Typo: Exercises MO.C12, MO.C13 are matrix equations (Preston Van Buren)
Typo: Subsection LISS.LI, bad reference to column vector linear independence (Troy Cornelius)
Typo: Solution MINM.M15, nonsingular should be singular (Preston Van Buren)
Typo: Exercise MINM.M10, missing comma (Sophie Scheller)
Typo: Theorem DNLT, missing "if" (Shepherd Engle)
Typo: Solution LISS.C26, five matrices span, not four (Alden Horowitz)
Typo: Two minor ones, LISS reading questions (Sophie Scheller, Preston Van Buren)
Change: Reworded Exercise TSS.M45 (Davis Shurbert)
Change: Subsection HP.DMHP, converted citation request (Troy Cornelius)
Change: Theorem SSS, clarified span is a subset, fixed missing brackets (Luran Li)

Packaging

- Tempting to make many formats
- All-in-one versus supplements
- Solutions, “Instructors” manual
- Print copies
 - Lulu.com (amateur grade)
 - Lightning Source (pro grade)
 - Amazon CreateSpace (untested)

Fund Raising

- Can you be rewarded monetarily?

Fund Raising

- Can you be rewarded monetarily?
- Should you be rewarded monetarily?

Fund Raising

- Can you be rewarded monetarily?
- Should you be rewarded monetarily?
- Build “profit” into print versions
- Solicit donations
 - Amazon Honor System (dead)
 - Dwolla, Pledge.com (no traction)
 - Lulu.com PDF (some success)
 - PayPal (scary)

Promotion

For a typical author, obscurity is a far greater threat than piracy.

— Tim O'Reilly

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- We write in hopes of being read
- Wikipedia articles (careful)
- George Cain's list, Georgia Tech
- Textbook Revolution

Web: <http://buzzard.ups.edu/talks.html>

Blog: <http://beezers.org/blog/bb>