Using LaTeX for AFIT Thesis Generation

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The Art of Typesetting

Whether you use an interface like Microsoft Word or a typesetting system like LaTeX...

When you create a digital document, you are writing a program!

The larger the program the more bugs it has and the more likely the program will encounter a catastrophic error.

Typesetting systems limit the new lines of code generated and produce a cleaner, easier-to-debug document.

History

TeX is a typesetting system developed by Dr Donald E. Knuth, author of the seminal multi-volume "The Art of Computer Programming".

Two goals of TeX

1. **Allow anyone to produce high quality books using a reasonable amount of effort**

2. **Provide a system that can reproduce the same results in the future.**

Very popular in academia where high quality and affordability in publishing is a must.

Using LaTeX

Advantages

- **Scalability!**
- **Portable!**
- **Reusable. Great ease in reformatting output**
- **High quality typesetting, esp. mathematical symbols, graphics**
- **Free! Excellent tools; all major operating systems supported**

Disadvantages

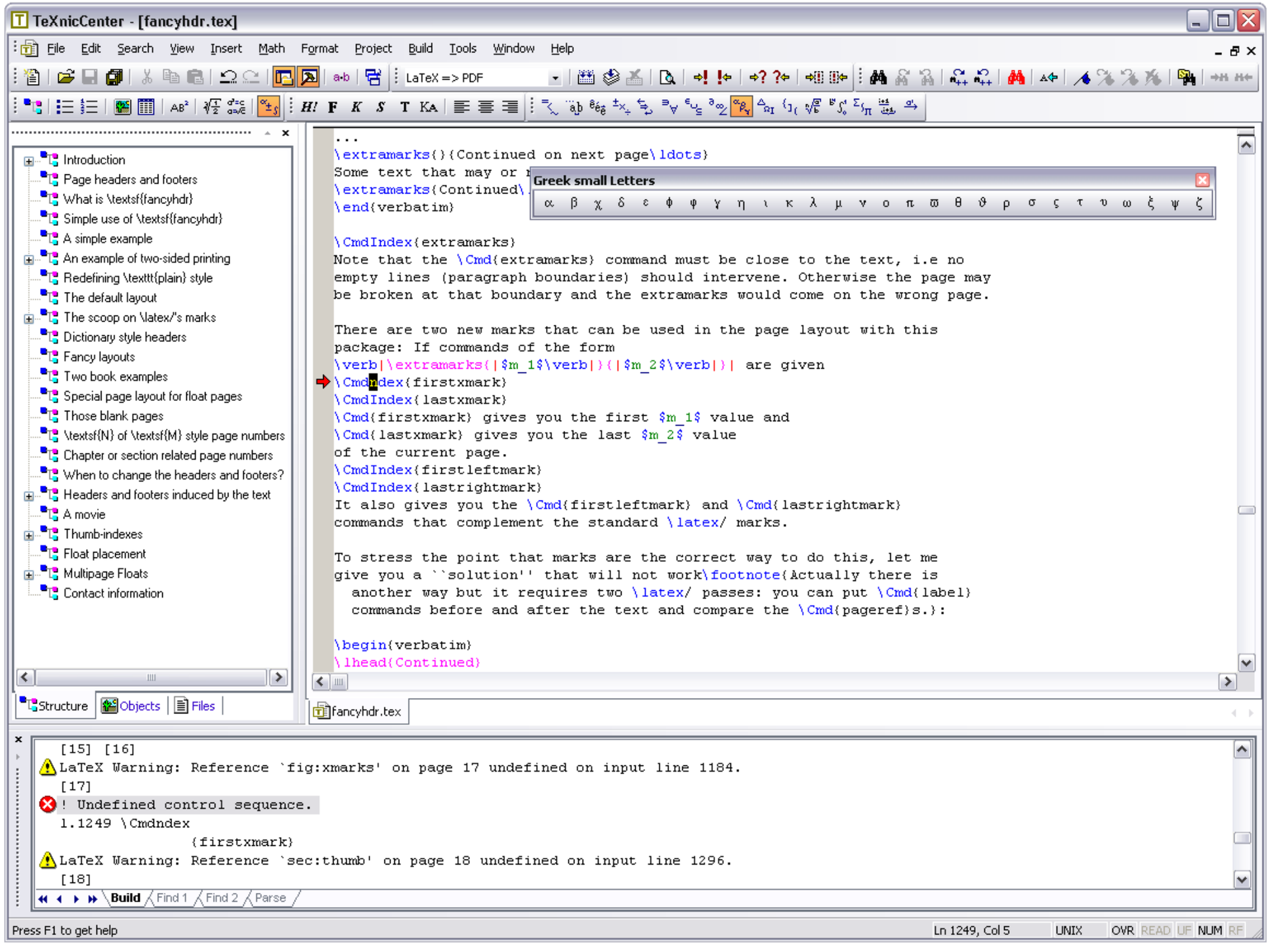
- **Complex workflow**
- **Learning LaTeX markup language**
- **Must develop skill of reading and debugging code**
- **Some on-the-fly reformatting only LaTeX gurus should try...**

Installing LaTeX

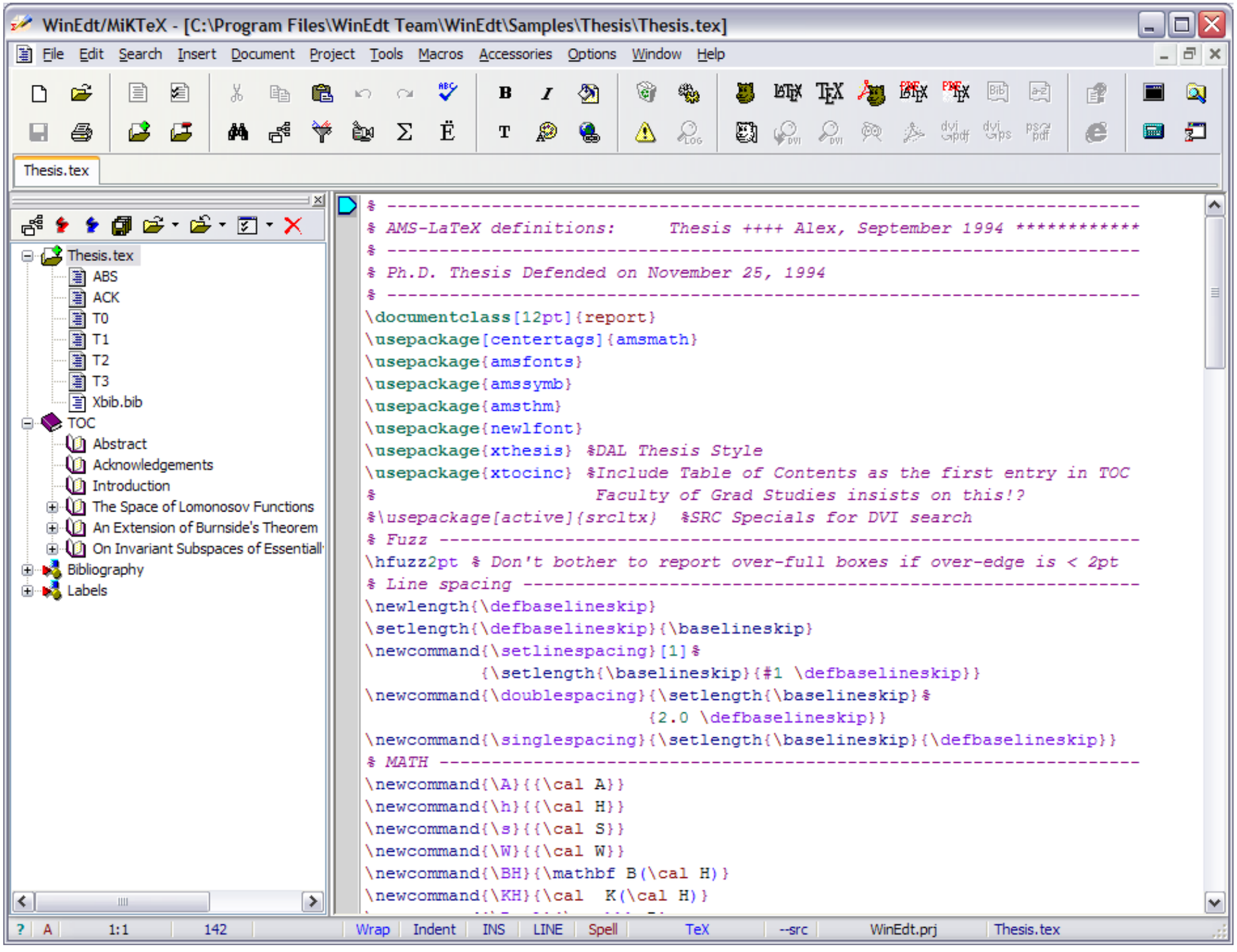
- **TeX distribution**
  - **Windows** proTeXt 3.1, MiKTeX 2.9
  - **Linux** TeX Live 2014
  - **Mac OS X** MacTeX 2014
- **Text editor/compiler**
  - **Windows** TeXnicCenter 2.02, WinEdt 8.2
  - **Linux** Kile 2.1.3
  - **Mac OS X** TeXShop 3.36 (also 2.47)
  - **Cross platform** TeXworks 0.4.5
- **WYSIWYG editor**
  - **Windows** Scientific Word
  - **Cross platform** LyX
- **Text editor: emacs**
  - **Look for editors with syntax highlighting for tex files**

Resource: www.tug.org

TeXnicCenter

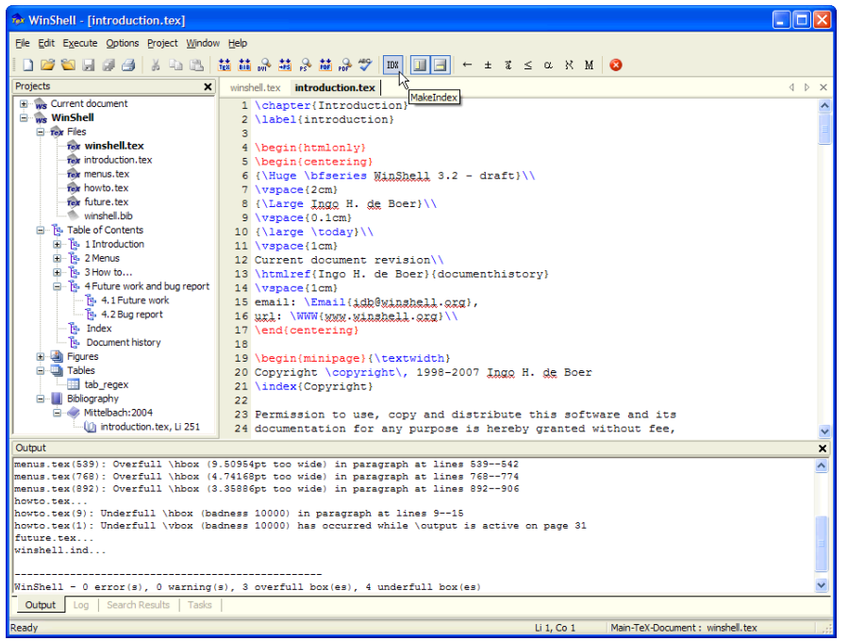


WinEdt

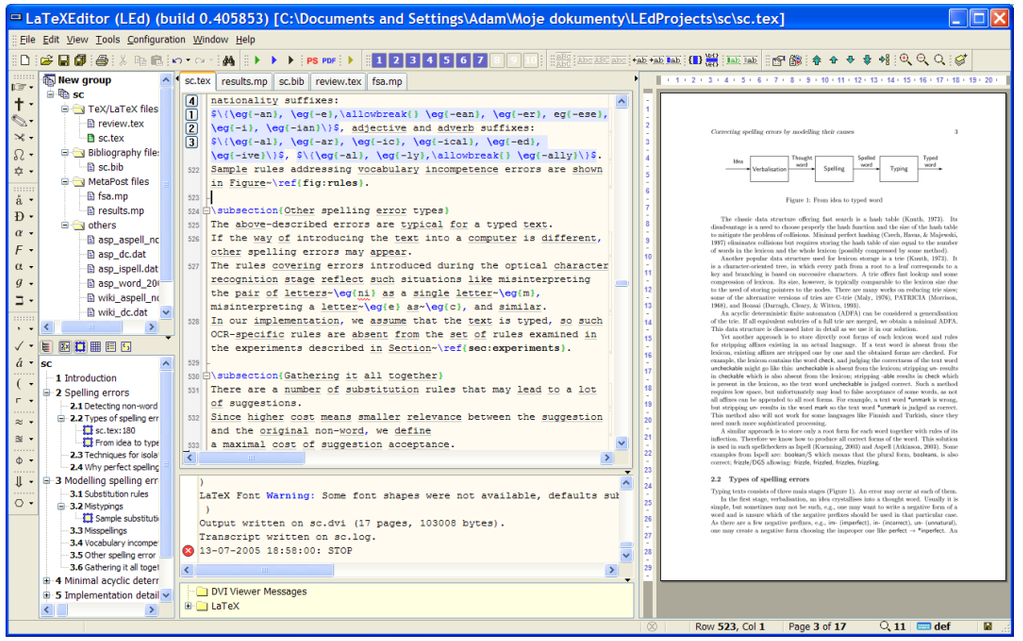

WinEdt/MiKTeX - [C:\Program Files\WinEdt Team\WinEdt\Samples\Thesis\Thesis.tex]
File Edit Search Insert Document Project Tools Macros Accessories Options Window Help
Thesis.tex
Thesis.tex
ABS
ACK
T0
T1
T2
T3
Xbib.bib
TOC
Abstract
Acknowledgements
Introduction
The Space of Lomonosov Functions
An Extension of Burnside's Theorem
On Invariant Subspaces of Essentiall
Bibliography
Labels
% ----------
% AMS-LaTeX definitions: Thesis ++++ Alex, September 1994 ***********
% ----------
% Ph.D. Thesis Defended on November 25, 1994
% ----------
\documentclass[12pt]{report}
\usepackage[centertags]{amsmath}
\usepackage{amsfonts}
\usepackage{amssymb}
\usepackage{amsthm}
\usepackage{newlfont}
\usepackage{xthesis} %DAL Thesis Style
\usepackage{xtocinc} %Include Table of Contents as the first entry in TOC
% Faculty of Grad Studies insists on this!?
%\usepackage[active]{srcltx} %SRC Specials for DVI search
% Fuzz ----------
\hfuzz2pt % Don't bother to report over-full boxes if over-edge is < 2pt
% Line spacing ----------
\newlength{\defbaselineskip}
\setlength{\defbaselineskip}{\baselineskip}
\newcommand{\setlinespacing}[1]%
{\setlength{\baselineskip}{#1 \defbaselineskip}}
\newcommand{\doublespacing}{\setlength{\baselineskip}%
{2.0 \defbaselineskip}}
\newcommand{\singlespacing}{\setlength{\baselineskip}{\defbaselineskip}}
% MATH ----------
\newcommand{\A}{{\cal A}}
\newcommand{\h}{{\cal H}}
\newcommand{\s}{{\cal S}}
\newcommand{\W}{{\cal W}}
\newcommand{\BH}{\mathbf B(\cal H)}
\newcommand{\KH}{\cal K(\cal H)}
? A 1:1 142 Wrap Indent INS LINE Spell TeX --src WinEdt.prj Thesis.tex

Others

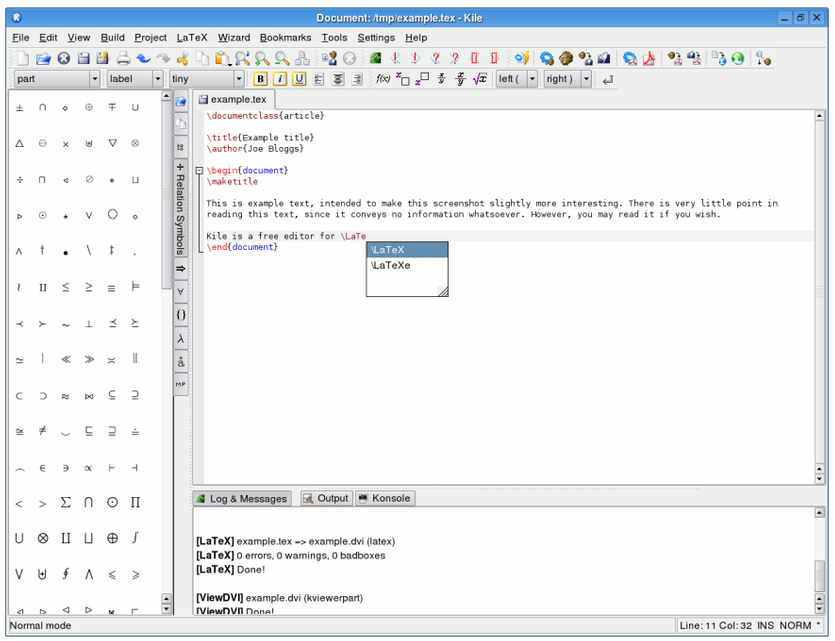
WinShell



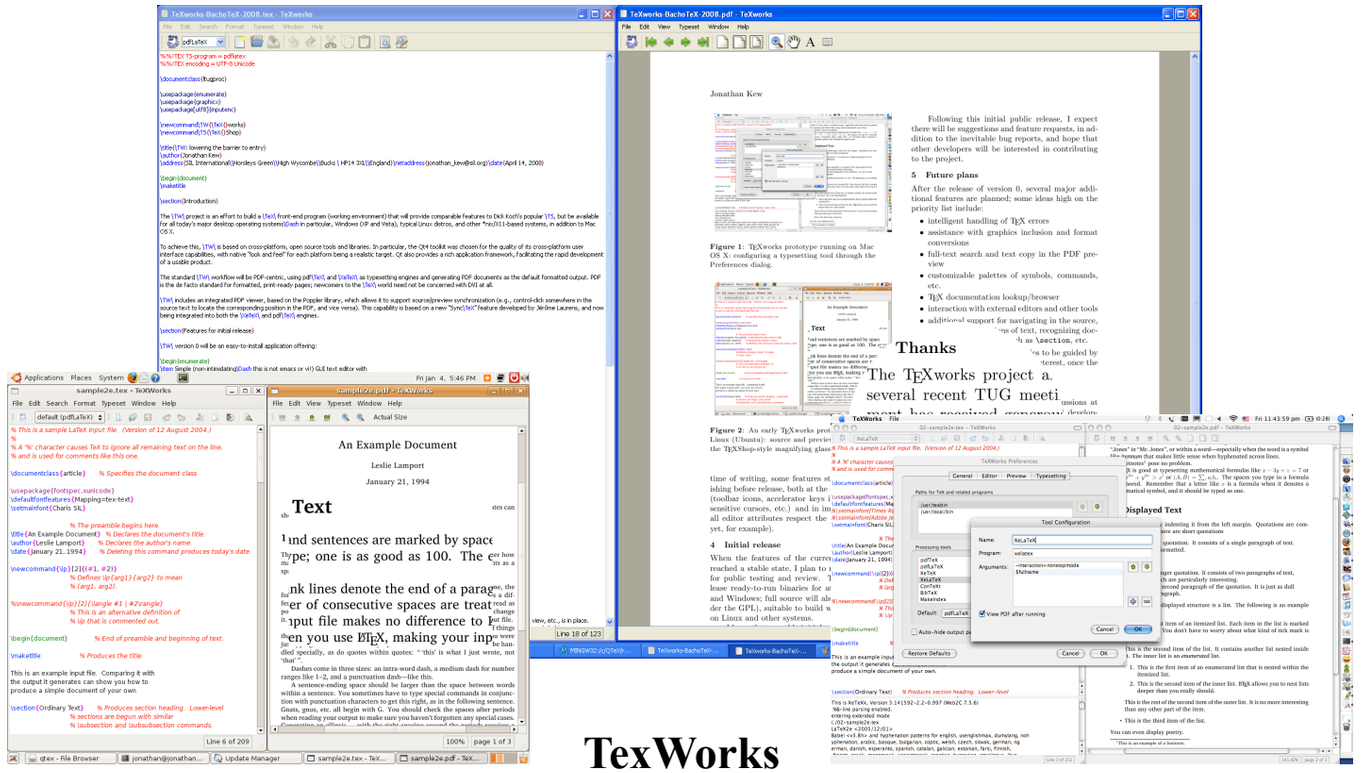
LaTeXEditor



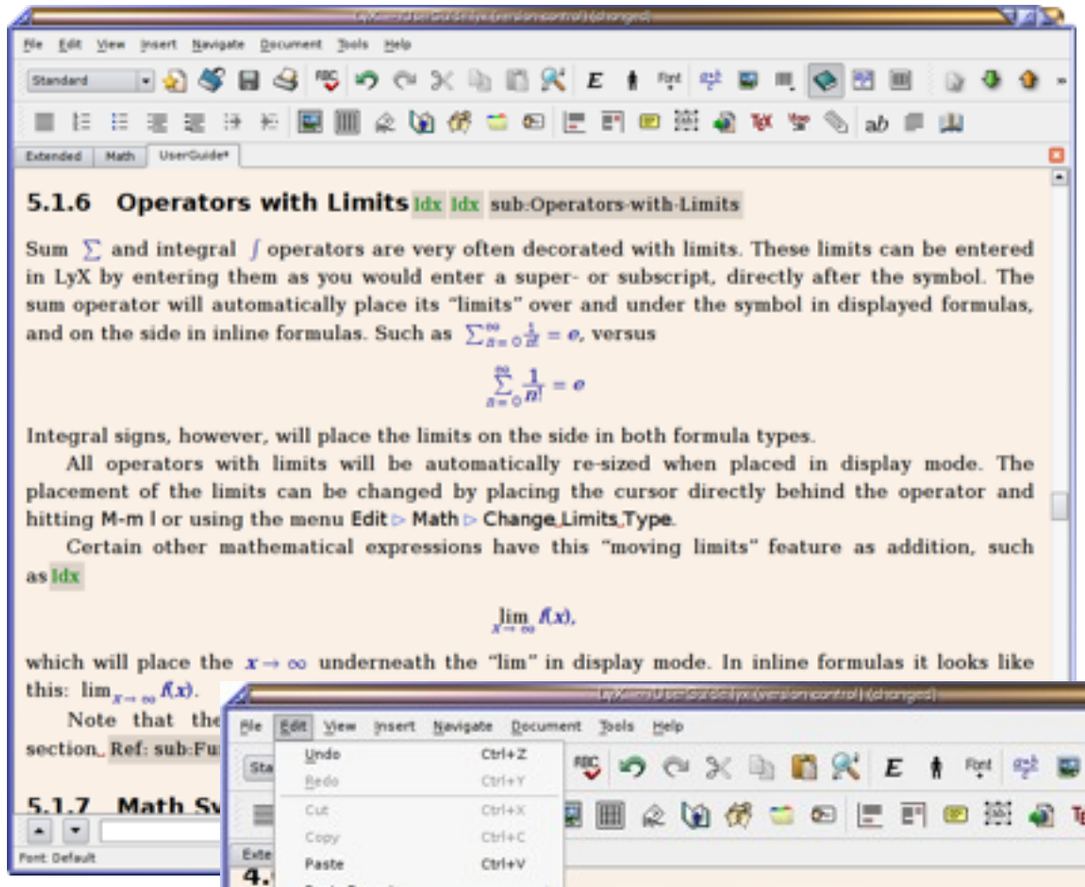
Kile

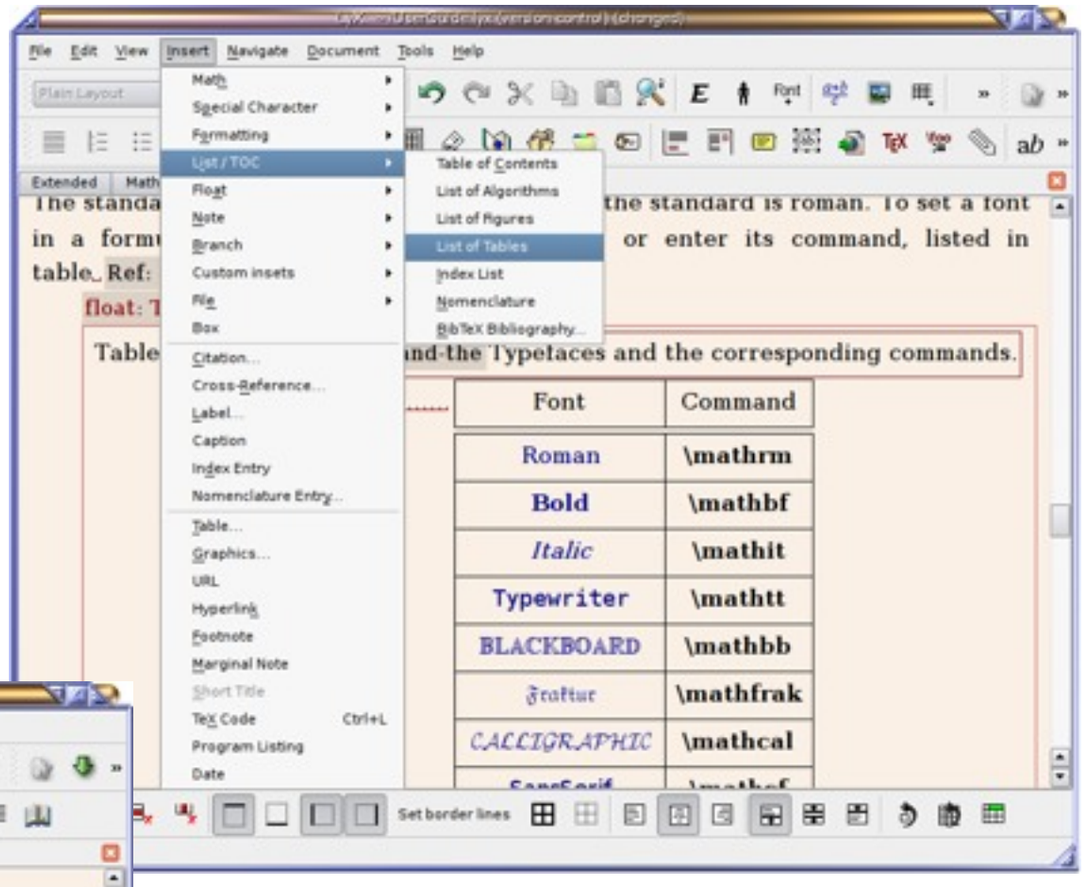


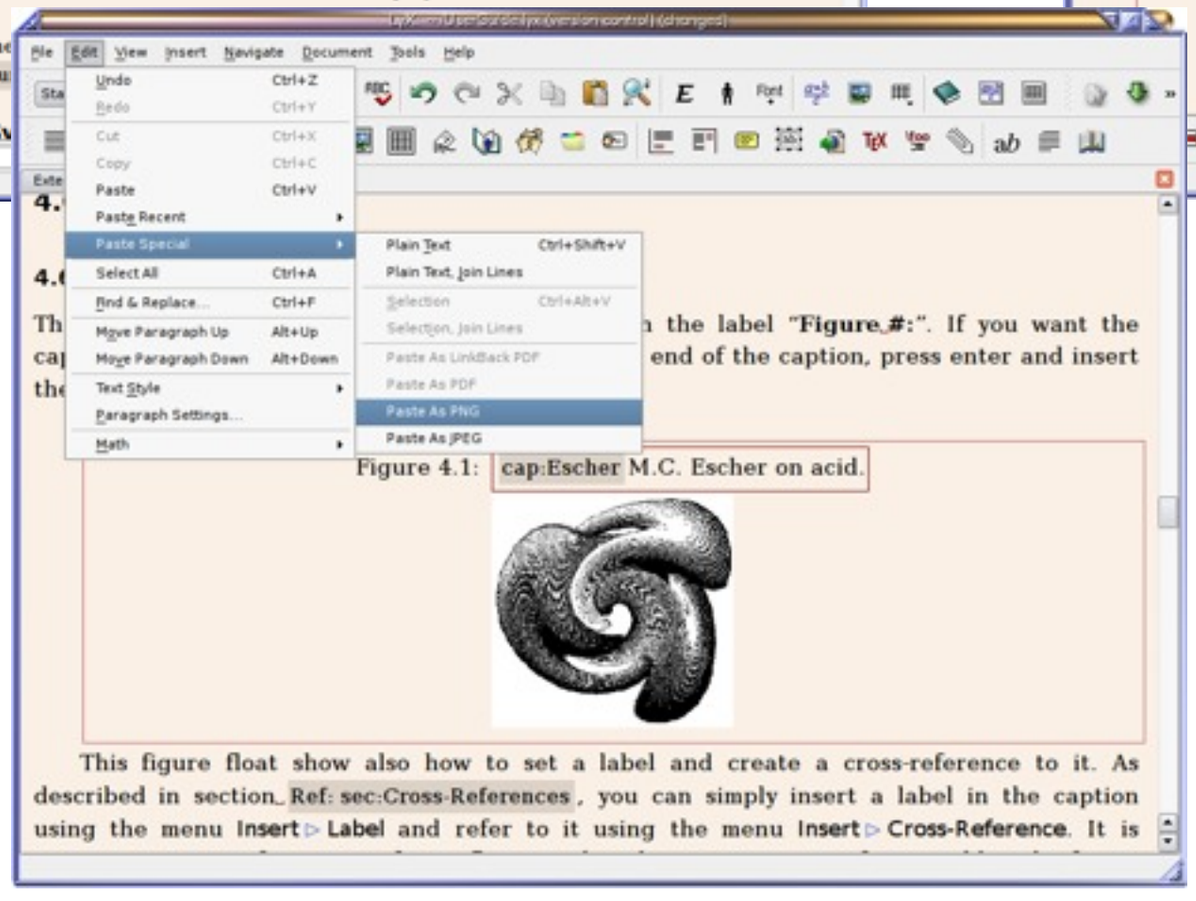
TexWorks



LyX:
What You See Is What You Mean







Resource: www.lyx.org

Entering Content

There are many excellent online tutorials and support documentation that come with the distributions

symbols-letter.pdf

tex for the impatient.pdf

Also see...

http://www.andy-roberts.net/misc/latex/

http://www.tug.org/tutorials/tugindia/

For those who venture into the style files....

http://www.tug.org/utilities/plain/cseq.html

AFIT's Customized Thesis Files

See AFIT LaTeX Primer for a tutorial on

- **Entering Thesis Data**
- **Adding Figures and Tables**
- **Adding Table of Contents and other front matter**
- **Using Customized Environments for AFIT theses and dissertations**
- **Sample directory of a complete typesetting project**

Also see the AFIT LaTeX Startup Kit

- **Just the bare essentials: master file; thesis style file; style files for SF 298, AFIT logo; customization files for front pages and SF 298**

Favorite Markup Commands

- \newcommand{\myCommand}{hello world}

  Use only letters in the command name... no numbers, no special characters.

- \input{chapter5}

  Previous AFIT latex templates use \include which is also an option. The commands are similar but the compilations logs for \input files are recorded in a master log.

  Use \include for debugging when you want to isolate the compilation log for a specific file.

Where are the latest version of the primer and AFIT LaTeX style files?

- The latest version of the AFIT LaTeX primer and the afitafitThesis style file are found on the L drive under the course PHYS files at L:\Courses\PHYS\LaTeX
- The current version of the AFIT style file is compliant with the latest version of the AFIT style guide.
  - Other style files exist on the L drive. Use at your own risk.
  - Older style files are not compliant with the AFIT style file nor with the current TeX distribution.
- Note: Historical tex files provide an excellent archive of formatting examples. Consider them fair game.

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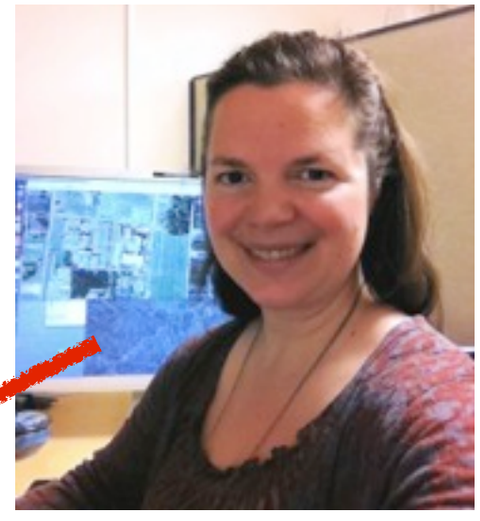
Disadvantages



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- ~~**Learning LaTeX markup language**~~
- **Must develop skill of reading and debugging code**
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AFIT's friendly LaTeX Guru

Dr Amy Magnus

Office: Bldg 640 Room 336D

Phone: x4555

Some LaTeX Examples

An itemized list

```
\begin{itemize}
  \item[(a)] $g$ is defined on all of $[0,1]$;
  \item[(b)] $g$ is non-decreasing on $[0,1]$;
  \item[(c)] $g(0)\geq 0$;
  \item[(d)] $g(1)\leq 1$.
\end{itemize}
```

On the Bibliography

Bibliography information is entered in a standardized environment.

```
@BOOK{apostle,
  author = {T. M. Apostle},
  year = 1974,
  title = {Mathematical Analysis},
  publisher = {Addison-Wesley Publishing Company},
  address = {Menlo Park}
}
```

Then, formated according to a chosen style.

```
\backmatter
    \singlespace
    \bibliographystyle{thesnumb3}
    \bibliography{bibliography}
```

To add bibliography information to a LaTeX document, run BibTeX and run LaTeX twice.