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ki Pūrehuroa

Introduction to L^AT_EX

for “Word users”

Heath James and Guy Kloss

IIMS Seminar, 28 March 2007

`{h.a.james | g.kloss}@massey.ac.nz`

LaTeX can save about two months formatting time off the average 3–4 year PhD writing cycle.

(Source: Peter Flynn, <http://www.silmaril.ie/cgi-bin/blog/>)

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Massey University
AUCKLAND

Introduction



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- What is LaTeX?
- LaTeX vs. Word
- Producing a Simple Document
- LaTeX Installation under Windows
- How to deal with problems?

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What is LaTeX?

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TeX and LaTeX?



- **TeX** is a computer program created by Donald E. Knuth. It is aimed at typesetting text and mathematical formulas.



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TeX and LaTeX?



- **TeX** is a computer program created by Donald E. Knuth. It is aimed at typesetting text and mathematical formulas.
- **LaTeX** is a macro package which enables authors to typeset and print their work at the highest typographical quality, using a predesigned, professional layout. LaTeX was originally written by Leslie Lamport. It uses the TeX formatter as its typesetting engine.



Why use LaTeX?



- Portability (Unix, Linux, Windows, MacOS, Amiga OS, DOS, ...)
- Flexibility (lots of packages)
- Precise Control
- Quality of Output (e. g. math formulas)
- Can be used to write documents in any language

Support for any Language



การใช้ภาษาไทยกับ L^AT_EX

如何使用 L^AT_EX 生成中文 PDF 文件
— How to Generate Chinese PDF Files with L^AT_EX

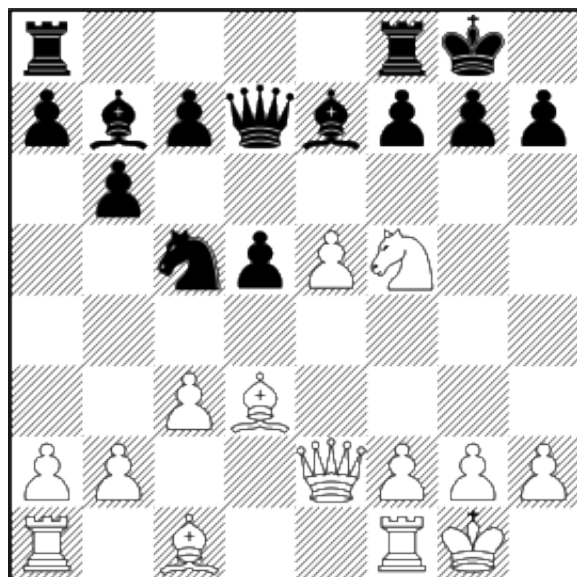
Ελληνικά στο L^AT_EX.



Other Examples



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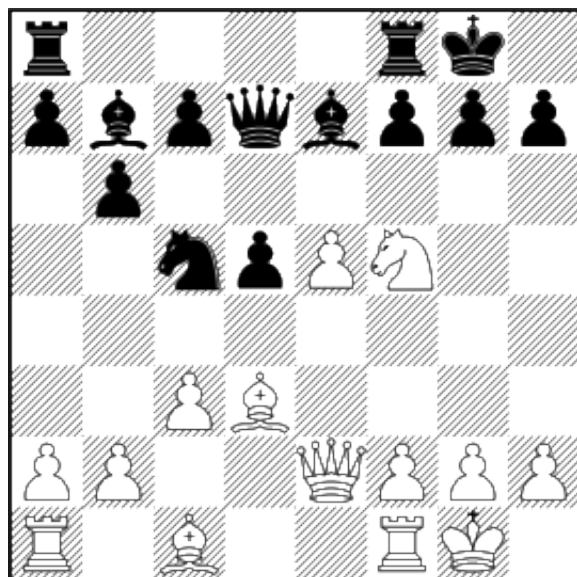


10. ... ♘c5×d3?
11. ♙e2-g4! Weiss gewinnt.

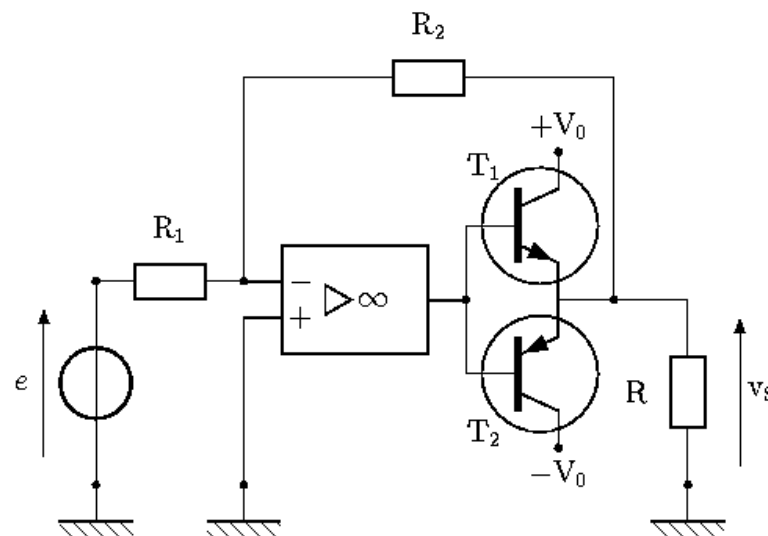
Other Examples



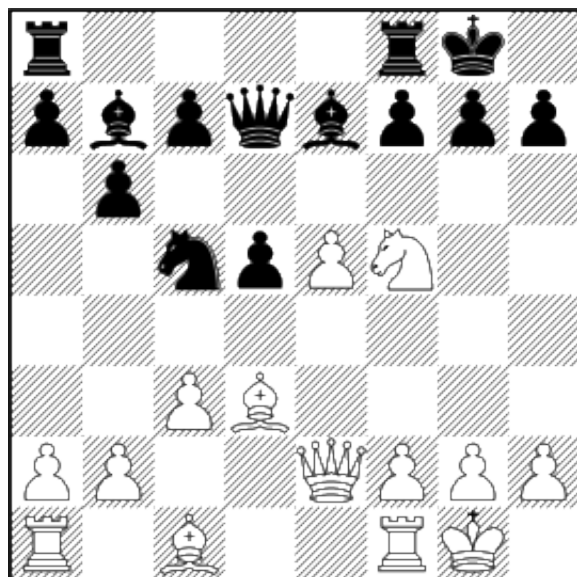
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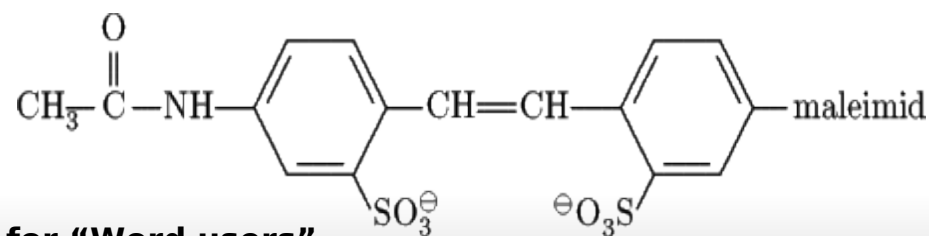
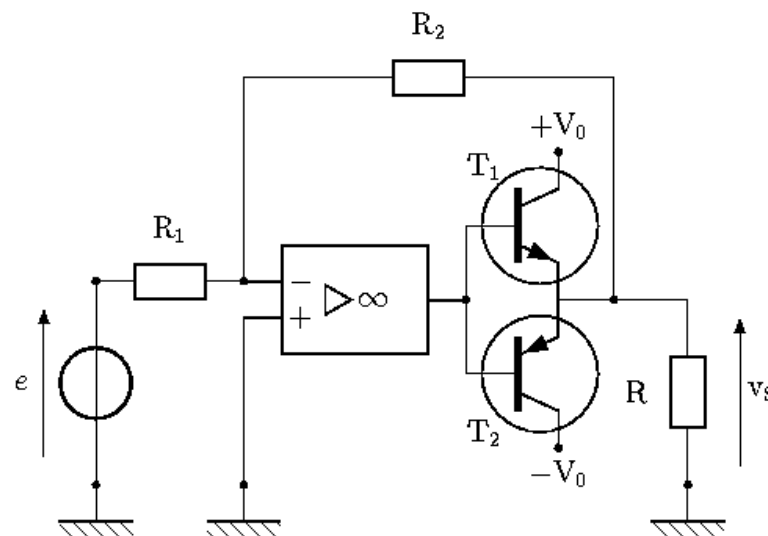
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Other Examples



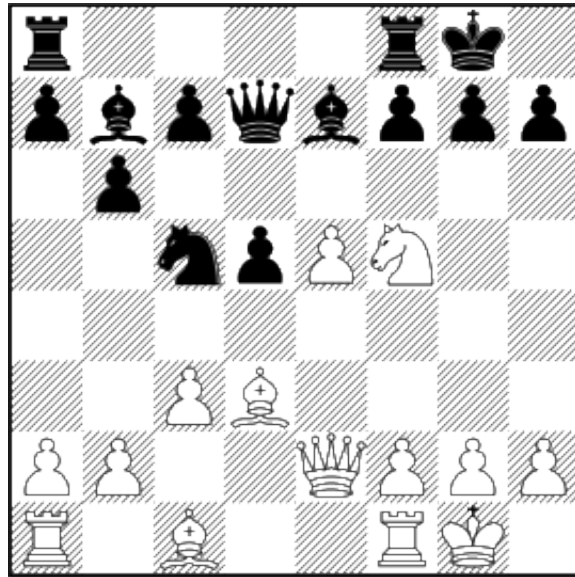
10. ... ♖c5×d3?
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Other Examples

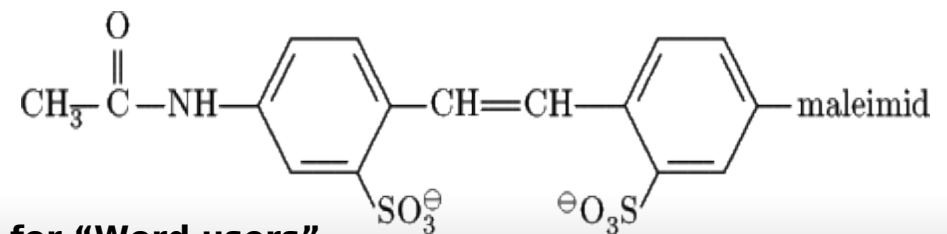
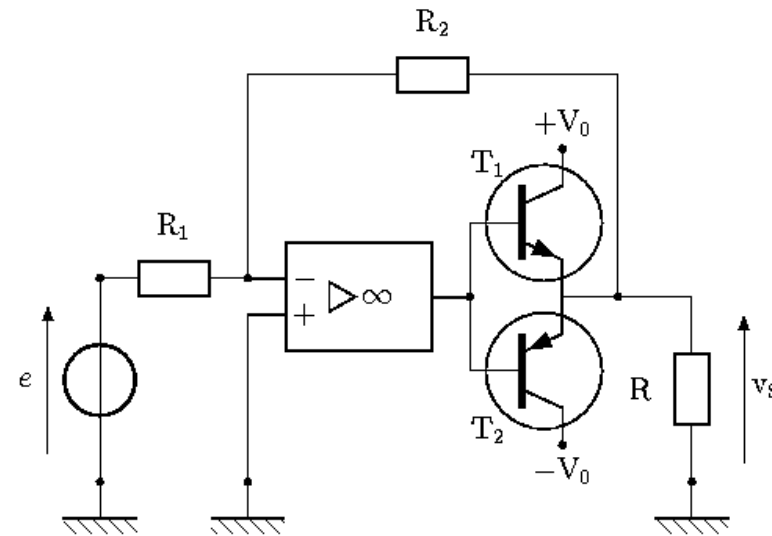


10. ... ♘c5xd3?
11. ♖e2-g4! Weiss gewinnt.

Fröhliche Weihnacht!

Text: August Heinrich Hoffmann von Fallersleben

Melodie: Aus England 19. JH, unbekannt



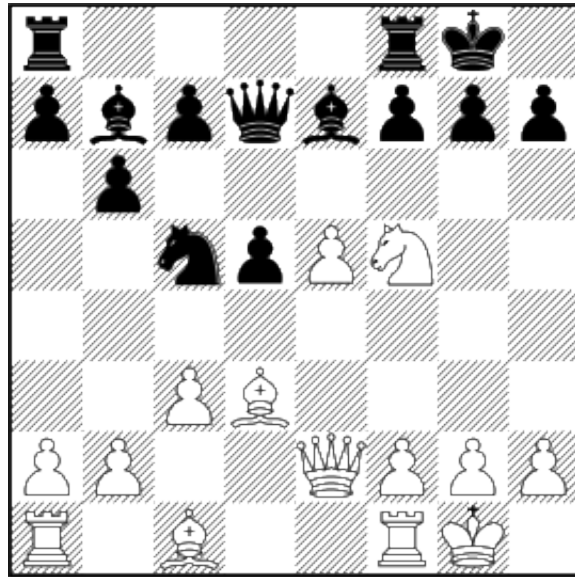
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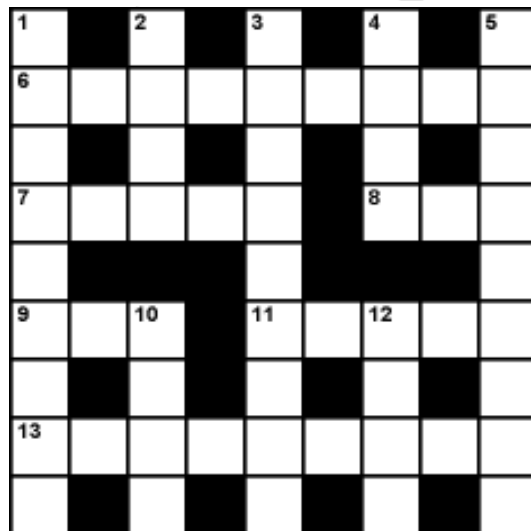
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Other Examples



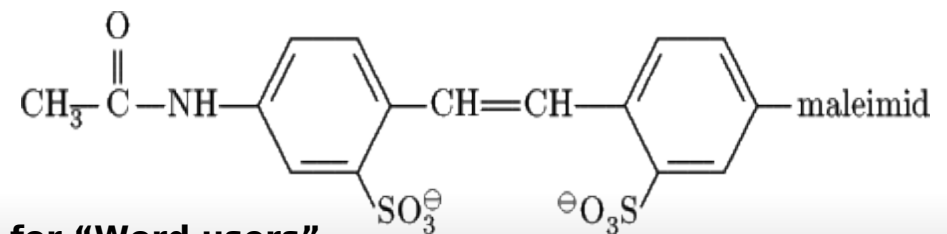
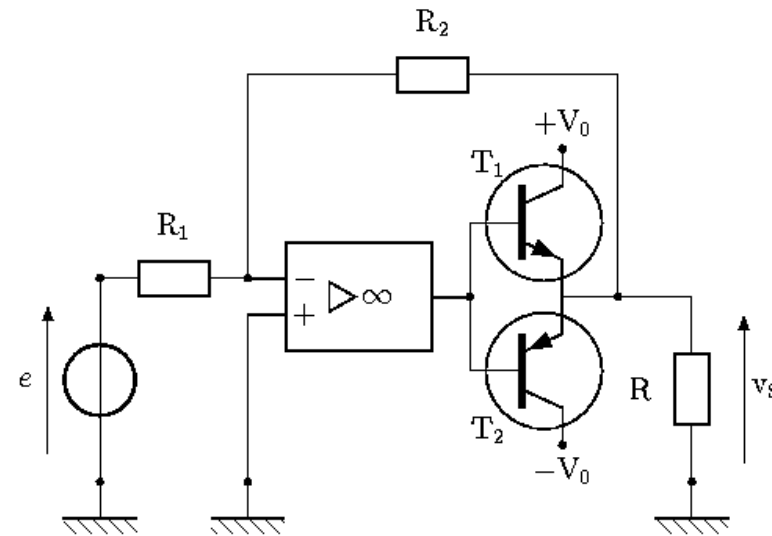
10. ... $\text{c5} \times \text{d3}?$
11.



Fröhliche Weihnacht!

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LaTeX vs. Word

LaTeX vs. Word



- Suitable for large projects
 - clear, explicit separation: content \Leftrightarrow style
 - ease with which a table of contents, bibliography and index can be generated
 - ability to split books, etc. into smaller (more manageable) pieces that are easily combined once writing is complete

LaTeX vs. Word



- Suitable for large projects
 - clear, explicit separation: content \Leftrightarrow style
 - ease with which a table of contents, bibliography and index can be generated
 - ability to split books, etc. into smaller (more manageable) pieces that are easily combined once writing is complete
- Stability and interchangeability of documents (as opposed to Word 6 vs. Office 95 vs. Office 97 vs. Office 2000 vs. Office XP vs. ...)
- No pressure to **upgrade NOW OR ELSE!**
- No Word viruses



TeX

monetary awards



- version: 3

Word

Microsoft Error Reporting



- version: Word 2



TeX

monetary awards



- version: 3.1

Word

Microsoft Error Reporting



- version: Word 6



TeX

monetary awards



- version: 3.141

Word

Microsoft Error Reporting



- version: Office 2000



TeX

monetary awards



- version: 3.141592

Word

Microsoft Error Reporting



- version: Office XP

Math Equations



- Word:

$$\iiint_G [u \nabla^2 v + (\nabla u, \nabla v)] d^3 V = \oiint_S \left(u \frac{\partial v}{\partial n} + v \frac{\partial u}{\partial n} \right) d^2 A$$

- LaTeX:

$$\iiint_G [u \nabla^2 v - v \nabla^2 u] d^3 V = \oiint_S \left(u \frac{\partial v}{\partial n} - v \frac{\partial u}{\partial n} \right) d^2 A$$



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Producing a Simple Document

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Producing LaTeX Documents



- For now, we will start with a simple, empty (text) document.
- Usually you start out by filling stuff into a skeleton document.
- Then you learn as you go.

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Producing LaTeX Documents



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- LaTeX is more WYMIWYG (What You Mean is What You Get) than WYSIWYG.

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Producing LaTeX Documents



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- Usually you start out by filling stuff into a skeleton document.
- Then you learn as you go.
- LaTeX is more WYMIWYG (What You Mean is What You Get) than WYSIWYG.
- The time invested initially will be very well gotten back at later times.
 - Less annoyances in formatting ...



Simple Document



```
\documentclass [a4paper,12pt]{article}
```

```
\usepackage {...}
```

```
% -----
```

```
\begin{document}
```

```
% -----
```

•

•

•

```
% -----
```

```
\end{document}
```

Simple Document



```
\documentclass [a4paper,12pt]{article}
```

preamble

```
\usepackage {...}
```

```
% -----
```

```
\begin{document}
```

```
% -----
```

•

•

•

```
% -----
```

```
\end{document}
```

Simple Document



```
\documentclass [a4paper,12pt]{article}
```

preamble

```
\usepackage {...}
```

```
% -----
```

```
\begin{document}
```

body

```
% -----
```

```
•  
•  
•
```

```
% -----
```

```
\end{document}
```

Hello World



```
\documentclass {article}
```

```
\begin{document}
```

```
Hello World!
```

```
\end{document}
```


Author Info



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```
\title{A Sample Document}
\author{Heath A. James \and Guy Kloss}
\date{...}
```

-
-
-

```
\maketitle
```

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Author Info



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```
\title{A Sample Document}
\author{Heath A. James \and Guy Kloss}
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preamble

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-
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Author Info



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-

body

```
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```

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Document Structure



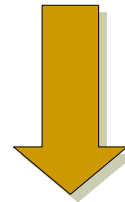
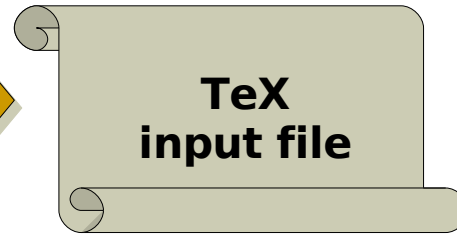
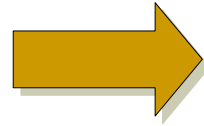
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```
\part{...}  
\chapter{...}  
\section{...}  
\subsection{...}  
\subsubsection{...}  
\paragraph{...}  
\subparagraph{...}
```

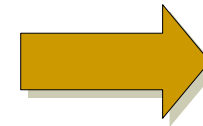
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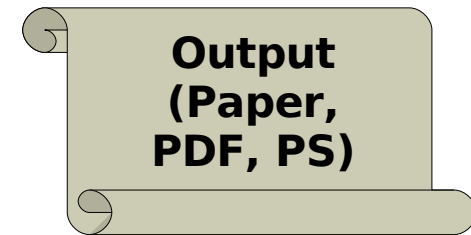
Necessary Steps to produce a document



**TeX/LaTeX
program**



**device
driver**



**short cut:
pdflatex**

LaTeX File Types



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- **.tex** LaTeX or TeX input file. Can be compiled with **latex**.
- **.sty** LaTeX macro package. This is a file you can load into your LaTeX document using the “**\usepackage**” command.
- **.cls** Class files define what your document looks like. They are selected with the “**\documentclass**” command.
- **.dtx** Documented TeX. This is the main distribution format for LaTeX style files.
- **.ins** Is the installer for the files contained in the matching **.dtx** file.

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LaTeX Installation under Windows



How to set up LaTeX for Windows (1)



- **Step One – MiKTeX**

<http://www.miktex.org/>

- **Step Two – Ghostscript and GSview**

<http://www.cs.wisc.edu/~ghost/>

- **Step Three – Acrobat Reader**








<http://www.adobe.com/products/acrobat/readstep2.html>



How to set up LaTeX for Windows (2)



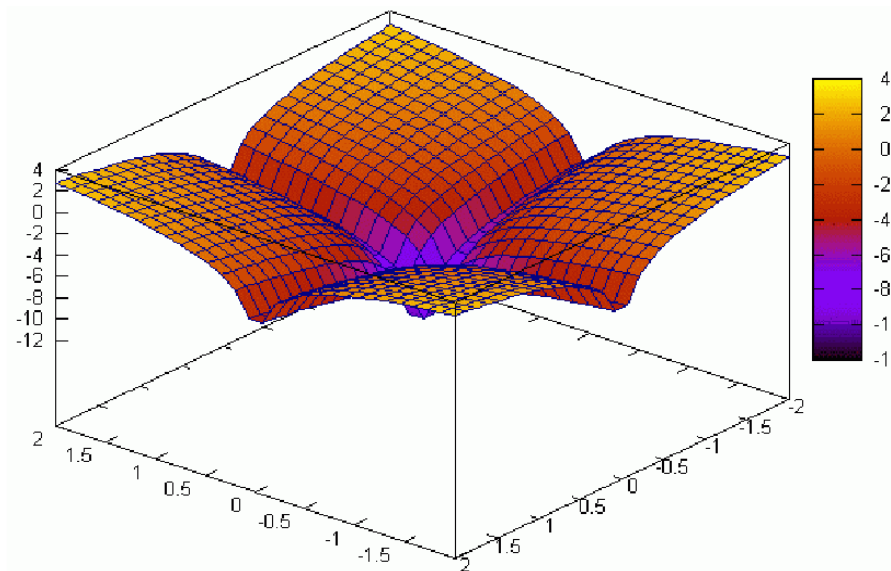
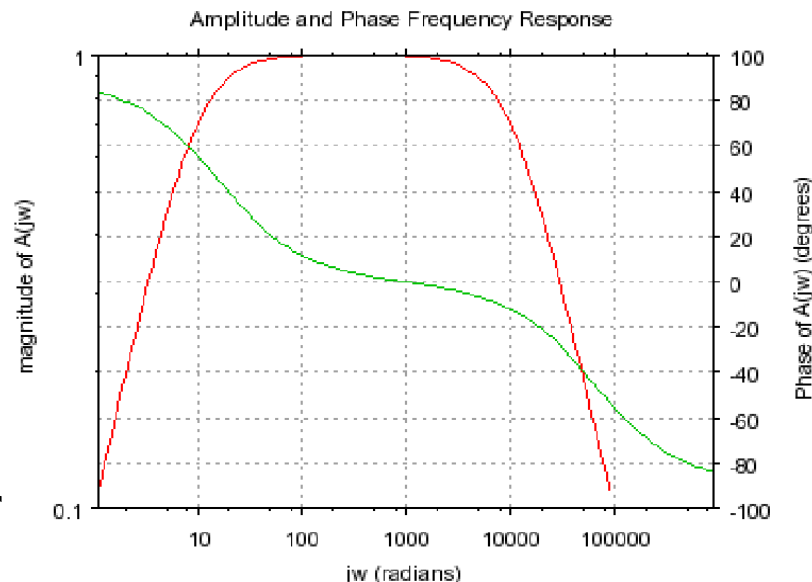
• Step Four – Windows Editor:

- **TeXnicCenter** (open source) 
<http://www.toolscenter.org/>
- **WinEdt** (share ware, Massey site license) 
<http://www.winedt.com/>
- **SciTE** (open source)  
- **LaTec plugin for Eclipse** (open source)   
- **emacs, vi, ...** (open source)   

Support Programs (1)



- Viewers
 - DVI
 - xdvi, kdvi, ...
 - PDF
 - Acrobat Reader
 - GhostView
 - xpdf, kpdf, ...
- Support Tools
 - BibTeX
 - GNUplot
 - xfig, ...



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Support Programs (2)



- Other Tools

- Reference Manager

- **JabRef** (open source, Java)

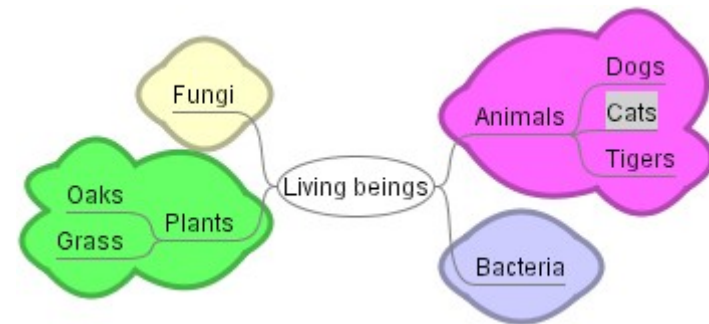
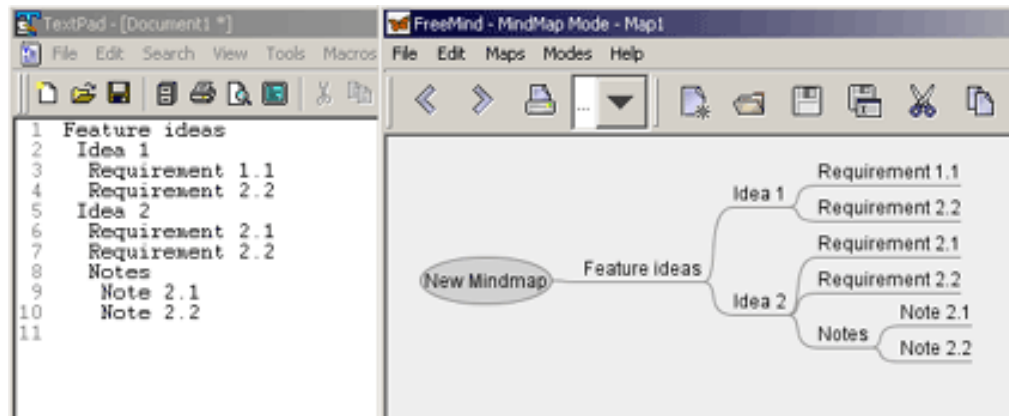
- <http://jabref.sourceforge.net/>



- Mind Manager

- **FreeMind** (open source, Java)

- <http://freemind.sourceforge.net/>





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How to deal with problems?

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Help (1)



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- The Not So Short Introduction to LaTeX2e
<http://tobi.oetiker.ch/lshort/lshort.pdf>
- LaTeX for Word Processor Users
<http://www.tex.ac.uk/tex-archive/info/latex4wp/latex4wp.pdf>
- Comprehensive TeX Archive Network
<http://www.ctan.org/> or <http://www.tex.ac.uk/>
- LaTeX Navigator
<http://tex.loria.fr/english/>
- TeX Catalogue
<http://www.ctan.org/tex-archive/help/Catalogue/>
- Wikibook LaTeX
<http://en.wikibooks.org/wiki/LaTeX>

Help (2)



- LaTeX Related Information

<http://theoval.cmp.uea.ac.uk/~nlct/latex/>

- For Complete Novices

<http://theoval.cmp.uea.ac.uk/~nlct/latex/novices/novices.html>

- To Write a PhD Thesis

<http://theoval.cmp.uea.ac.uk/~nlct/latex/thesis/thesis.html>

- LaTeX2e help 1.4

http://www.emerson.emory.edu/services/latex/latex2e/latex2e_toc.html

- Beginning LaTeX

<http://www.cs.cornell.edu/Info/Misc/LaTeX-Tutorial/LaTeX-Home.html>

- Norm Matloff's LaTeX Tutorial Site

<http://heather.cs.ucdavis.edu/~matloff/latex.html>

- 5-Minute LaTeX Tutorial

<http://heather.cs.ucdavis.edu/~matloff/LaTeX/FiveMinute.html>

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Any Questions?

Slides & Further Information:

<https://GuteFee.massey.ac.nz/moin/HOWTO/LaTeX>



Warner Bros.