

L^AT_EX: More Than Just Academic Papers and Theses

(FIRST PRESENTED AT MOSC2011)



LianTze Lim (Ph.D.) (liantze@gmail.com)

<http://liantze.penguinattack.org>

CC BY-NC-SA (Yes, you can reuse this deck 😊)



Illustration by Duane Bibby

Contents

- 1 What are T_EX, L^AT_EX and Friends?
- 2 Document Types
- 3 Special Material
- 4 Wrapping Up

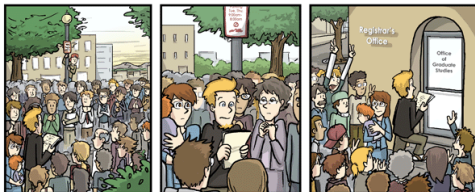
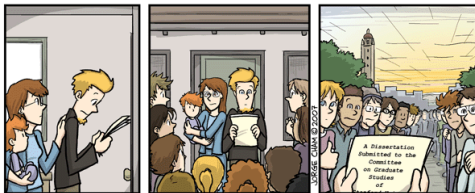
Contents

1 What are TeX, LaTeX and Friends?

2 Document Types

3 Special Material

4 Wrapping Up



PHD Comics By Jorge Cham

Ever Worried about These?

- Is my literature survey strong enough?
- My bibliography/citation formatting got inconsistent.
- My citation and bibliography aren't synchronised!
- My math equations don't display/print correctly.
- Should this discussion go under this section or that?
- What formatting did I use for my subsection headings again?
- Didn't I set that heading to bold and italic 5 minutes ago?
- My section/figure/page numbering's gone all wrong!
- Does this subsection go together with this section?
- Oops, I forgot to update the TOC.
- What results should I put in this table?
- My figure jumped off the page again!
- The application crashed!
- **MY FILE GOT CORRUPTED!!!**

What are T_EX and L^AT_EX, and Friends?

T_EX

- From Greek τεχ
- ASCII TeX, /tex/, /tek/
- A **computer typesetting system** created by Donald Knuth
- for ‘the creation of beautiful books’

L^AT_EX

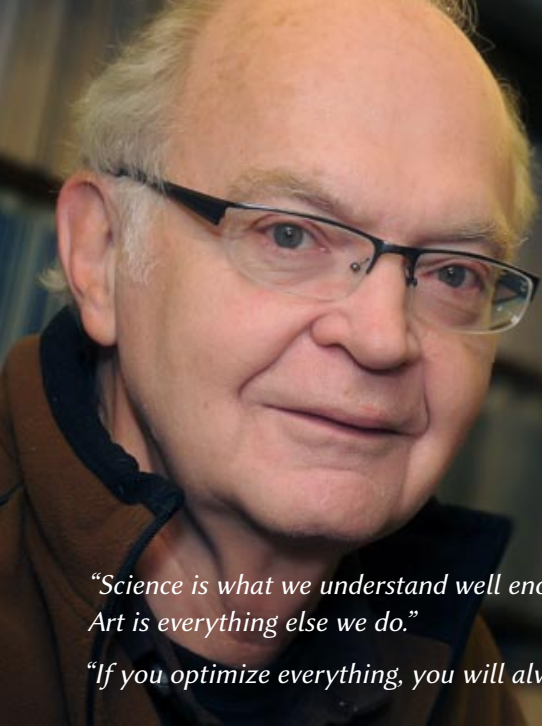
- ASCII LaTeX, /l^atex/, /l^atek/, /l^a:tex/, /l^a:tek/
- A **document preparation system** by Leslie Lamport

Binaries

- ϵ -T_EX: additional primitives to T_EX
- pdfT_EX: additional PDF-related primitives
- XeT_EX: native UTF-8 input; can access system fonts
- LuaT_EX: includes the Lua scripting engine

Friends

- BibT_EX, MakeIndex, METAFONT, METAPOST, ...
- http://www.ctan.org/what_is_tex.html



Donald Knuth (1938–)

- American computer scientist, mathematician, and professor emeritus at Stanford University
- Author of the multi-volume work *The Art of Computer Programming*
- “Father of the analysis of algorithms”

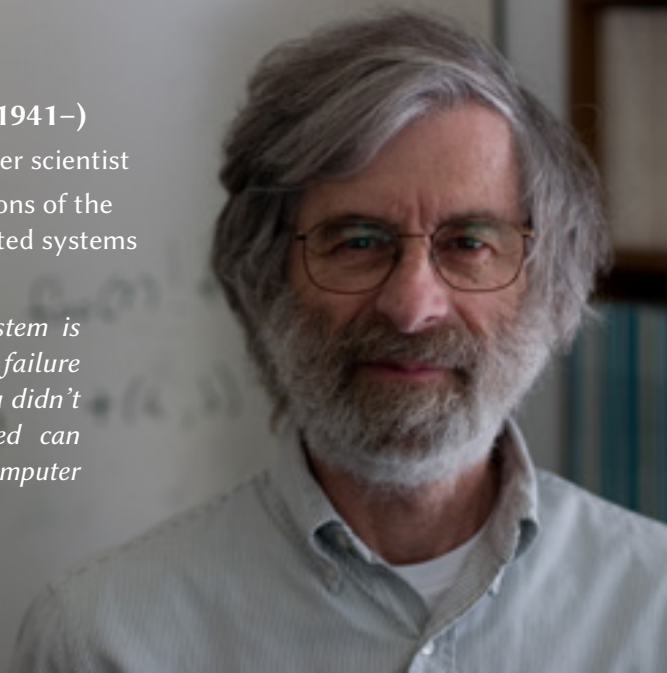
*“Science is what we understand well enough to explain to a computer.
Art is everything else we do.”*

“If you optimize everything, you will always be unhappy.”

Leslie Lamport (1941–)

- American computer scientist
- Laid the foundations of the theory of distributed systems

“A distributed system is one in which the failure of a computer you didn’t even know existed can render your own computer unusable.”



Why?

From http://www.ctan.org/what_is_tex.html

Output Quality

- It has the best output.
- It knows typesetting.

Freedom

- It's free.
- It runs anywhere.

Superior Engineering

- It's fast.
- It's stable.
- It's not rigid (extensible).
- Plain text input.
- Many output types.

Popularity

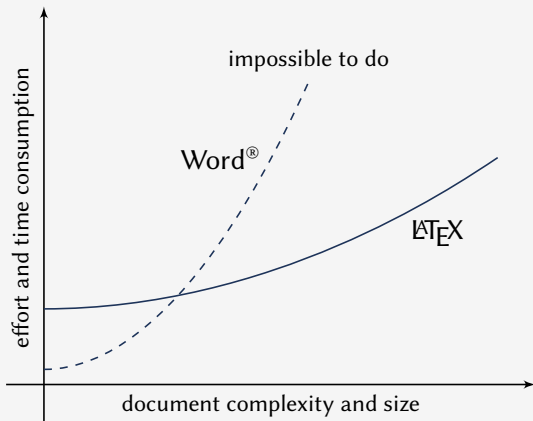
- It's the standard (in academia and science).

Typesetting and Word Processing

Apples and Oranges

- Word processors
 - Replacement of mechanical typewriters
 - Word, OpenOffice, AbiWord, ...
- Typesetting and Desktop publishing
 - For publication and printing
 - InDesign, QuarkXPress, Scribus...

Scalability



Scalability of LaTeX and Microsoft Word® against document size and complexity (redrawn from Marko Pinteric's original at <http://www.pinteric.com/miktex.html>)

Professional Typesetting Quality Output

- Typesetting quality and legibility
 - good kerning hinting and correct ligatures
 - inter-word, line and paragraph spacing
 - context-sensitive hyphenation

Table fiery fluffy

This paper outlines an approach to produce a prototype WordNet system for Malay semi-automatically, by using bilingual dictionary data and resources provided by the original English WordNet system. Senses from an English-Malay bilingual dictionary were first aligned to English WordNet senses, and a set of Malay synsets were then derived. Semantic relations between the English WordNet synsets were extracted and re-applied to the Malay synsets, using the aligned synsets as a guide. A small Malay WordNet prototype with 12429 noun synsets and 5805 verb synsets was thus produced. This prototype is a first step towards building a full-fledged Malay WordNet.

Table fiery fluffy

This paper outlines an approach to produce a prototype WordNet system for Malay semi-automatically, by using bilingual dictionary data and resources provided by the original English WordNet system. Senses from an English-Malay bilingual dictionary were first aligned to English WordNet senses, and a set of Malay synsets were then derived. Semantic relations between the English WordNet synsets were extracted and re-applied to the Malay synsets, using the aligned synsets as a guide. A small Malay WordNet prototype with 12429 noun synsets and 5805 verb synsets was thus produced. This prototype is a first step towards building a full-fledged Malay WordNet.

- Correct mathematical typesetting (spacing etc)

$$W_{\psi}(f)(a, b) = \frac{1}{\sqrt{a}} \int_{-\infty}^{\infty} f(t) \psi\left(\frac{t-b}{a}\right) dt$$

$$W_{\psi}(f)(a, b) = \frac{1}{\sqrt{a}} \int_{-\infty}^{\infty} f(t) \psi\left(\frac{t-b}{a}\right) dt$$

Where Would I Want to Use L^AT_EX?

- Beautiful typographic output (OK not everyone cares that much...)
- Documents with complex structures
- Lots of mathematics (or other specific needs)
- When publishers **require** them
- Batch processing of data into reports, etc.
- Back-end of other applications

This is not a Word Processors vs L^AT_EX debate.

- It's a 'teaser' preview of an alternative tool.
- Some word processors also provide mechanisms to handle same routine tasks (with varying degrees of ease, consistency and stability)
- Use the best tool for the task at hand.
- **You** are the best judge to decide for yourself.

How Do I Use It?

- 1 Write a plain text L^AT_EX file (.tex)
- 2 Run it through `pdflatex` or `xelatex` → PDF output
(or `latex` + `dvips` + `ps2pdf` for DVI + PS + PDF)
- 3 Run `bibtex` and/or `makeindex` to process bibliographies, indices
- 4 Re-run `pdflatex` to resolve references and pointers

Example .tex File

```

\documentclass[a4paper,11pt]{article}
\author{Lim Lian Tze}
\title{An Introductory Paper}
\date{\today}
\usepackage[english]{babel}

\begin{document}
\maketitle
\tableofcontents

\begin{abstract}
This paper introduces\ldots
\end{abstract}

\section{Introduction}
We consider\ldots

\section{State of the Art}
We look at\ldots

\subsection{Document Formats}
There are many\ldots
\end{document}

```

pdflatex

An Introductory Paper

Lim Lian Tze
June 7, 2011

Contents

1	Introduction	1
2	State of the Art	1
	2.1 Document Formats	1

Abstract

This paper introduces...

1 Introduction

We consider...

2 State of the Art

We look at...

2.1 Document Formats

There are many...

1

Where Do I Get It?

Online Overleaf (www.overleaf.com)

Windows MikT_EX, T_EXLive

Un*x, GNU/Linux T_EXLive

Mac OS X MacT_EX (based on T_EXLive)

Installation Use your OS' package manager
(or download manually)

Editors vi, emacs, Texmaker, TeXworks, Texstudio, TeXshop...

L^AT_EX Packages Use MikT_EX or T_EXLive's package manager

Documentation (Online) <http://texdoc.net/pkg/<packagename>>
(T_EXLive) \$ texdoc <package name>
(MikT_EX) \$ mthelp <package name>

Easy to Learn, Hard to Master

- Customising may not be straightforward (vs word processors)
- Intentionally so: Style guidelines should be followed strictly
 - Publisher/organisation provides **document class** or **style** files
 - Use these to take care of formatting and styling, focus on the **content**

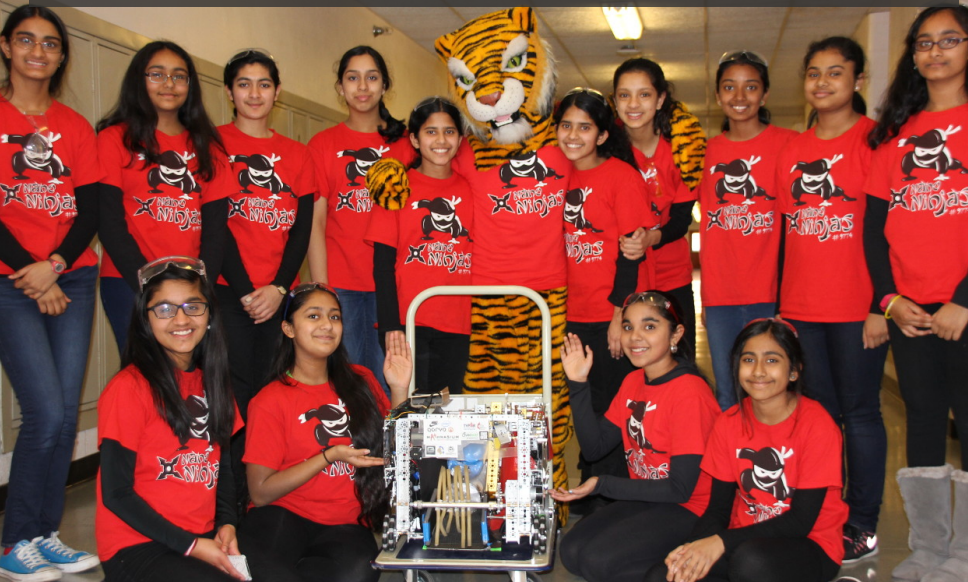
Too hard, only for engineers/mathematicians?

- I once guided a student in the humanities to learn authoring Chinese LaTeX documents entirely through e-mail
- Recently a 75-year-old user transitioned to LaTeX on Overleaf to write a book (with indices, end notes, cross references)
- Professor in Finance at Trinity College transitioned to LaTeX successfully (<https://www.overleaf.com/blog/299>)
- Linguists, psychologists, biostatistics (integrating with R), legal profession...



Prof Brian Lucey, Trinity College, Dublin

Nano Ninjas – a group of 7th- and 8th-graders from Portland, OR



Collaboratively wrote an engineering notebook with **300+ pages** in \LaTeX as part of their FIRST Tech Challenge win (<https://www.overleaf.com/read/hkxzqcncngyv>)

So, What Can LaTeX Do?

Contents

1 What are T_EX, L^AT_EX and Friends?

2 Document Types

3 Special Material

4 Wrapping Up

Basic Types

Books

```
\documentclass{book}
\author{...}
\title{...}

\begin{document}
\maketitle
\chapter{...}
\section{...}
...
\subsection{...}
\end{document}
```

A Wonderful Book

A. Dumas
3rd June 2011

Chapter 1 Heading on level 0 (chapter)

Info: here is some text without a meaning. This text should show how a general text will look like in this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between this text and some sentence like "the author's address". Right. There isn't! A blind test like this gives you information about the selected font, how the letters are written and the impression of the book. This text should contain all letters of the alphabet and it should be written in all of the original languages. There is no need for a special content, but the length of words should match to the language.

1.1 Heading on level 1 (section)

Info: here is some text without a meaning. This text should show how a general text will look like in this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between this text and some sentence like "the author's address". Right. There isn't! A blind test like this gives you information about the selected font, how the letters are written and the impression of the book. This text should contain all letters of the alphabet and it should be written in all of the original languages. There is no need for a special content, but the length of words should match to the language.

1.1.1 Heading on level 2 (subsection)

Info: here is some text without a meaning. This text should show how a general text will look like in this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between

1

4 CHAPTER 1: HEADINGS ON LEVEL 0 (CHAPTER)

this text and some sentence like "the author's address". Right. There isn't! A blind test like this gives you information about the selected font, how the letters are written and the impression of the book. This text should contain all letters of the alphabet and it should be written in all of the original languages. There is no need for a special content, but the length of words should match to the language.

Heading on level 1 (subsection)

Info: here is some text without a meaning. This text should show how a general text will look like in this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between this text and some sentence like "the author's address". Right. There isn't! A blind test like this gives you information about the selected font, how the letters are written and the impression of the book. This text should contain all letters of the alphabet and it should be written in all of the original languages. There is no need for a special content, but the length of words should match to the language.

Heading on level 2 (paragraph) **Info:** here is some text without a meaning. This text should show how a general text will look like in this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between this text and some sentence like "the author's address". Right. There isn't! A blind test like this gives you information about the selected font, how the letters are written and the impression of the book. This text should contain all letters of the alphabet and it should be written in all of the original languages. There is no need for a special content, but the length of words should match to the language.

1.2 Lists

1.2.1 Example for list (summary)

- First item in a list
- Second item in a list
- Third item in a list
- Fourth item in a list
- Fifth item in a list

1.2 LISTS

Example for list (summary)

- First item in a list
 - First item in a list
 - First item in a list
 - Second item in a list
 - Second item in a list
- Second item in a list

1.2.2 Example for list (summary)

- 1. First item in a list
 - 1. First item in a list
 - 2. Second item in a list
 - 3. Third item in a list
 - 4. Fourth item in a list
- 2. Fifth item in a list

Example for list (summary)

- 1. First item in a list
 - (a) First item in a list
 - (b) First item in a list
 - (c) Second item in a list
 - (d) Second item in a list
- 2. Second item in a list

Basic Types (cont'd)

Articles

```
\documentclass{article}
```

```
\author{...}
```

```
\title{...}
```

```
\begin{document}
```

```
\maketitle
```

```
\section{...}
```

```
...
```

```
\subsection{...}
```

```
\end{document}
```

A Wonderful Read

A. Dimsy

Jul 16, 2011

1 Heading on level 1 (section)

Hi, here is some text without a section. This text should have a general text will look like at this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between the text and some content like (theoretical problems). Right. There is not!

A third text like this gives you information about the selected text, how the letters are written and the appearance of the link. This text should contain all letters of the alphabet and it should be written in the original language. There is no need for a special content, but the length of words should match to the language.

1.1 Heading on level 2 (subsection)

Hi, here is some text without a section. This text should have a general text will look like at this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between the text and some content like (theoretical problems). Right. There is not!

A third text like this gives you information about the selected text, how the letters are written and the appearance of the link. This text should contain all letters of the alphabet and it should be written in the original language. There is no need for a special content, but the length of words should match to the language.

1.1.1 Heading on level 3 (subsubsection)

Hi, here is some text without a section. This text should have a general text will look like at this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between the text and some content like (theoretical problems). Right. There is not!

1

A third text like this gives you information about the selected text, how the letters are written and the appearance of the link. This text should contain all letters of the alphabet and it should be written in the original language. There is no need for a special content, but the length of words should match to the language.

Heading on level 4 (paragraph) Hi, here is some text without a section. This text should have a general text will look like at this place. If you read this text, you will get an information. Really? Is there an information? Is there a difference between the text and some content like (theoretical problems). Right. There is not!

A third text like this gives you information about the selected text, how the letters are written and the appearance of the link. This text should contain all letters of the alphabet and it should be written in the original language. There is no need for a special content, but the length of words should match to the language.

2 Lists

2.1 Example for list (enumeration)

- First item in a list
- Second item in a list
- Third item in a list
- Fourth item in a list
- Fifth item in a list

2.1.1 Example for list (Description)

- First item in a list
 - First item in a list
 - First item in a list
 - Second item in a list
 - Second item in a list
- Second item in a list

2

2.2 Example for list (enumeration)

1. First item in a list
2. Second item in a list
3. Third item in a list
4. Fourth item in a list
5. Fifth item in a list

2.2.1 Example for list (Description)

1. First item in a list
 - (a) First item in a list
 - (b) First item in a list
 - (c) Second item in a list
 - (d) Second item in a list
2. Second item in a list

2.3 Example for list (description)

First item in a list

Second item in a list

Third item in a list

Fourth item in a list

Fifth item in a list

2.3.1 Example for list (Description)

- First item in a list
 - First item in a list
 - First item in a list
 - Second item in a list

3

Second item in a list

Second item in a list

Second item in a list

Second item in a list

Some Goodies

- Quick [language-switching](#) with `babel`
- Automatic generation of [cross-referencing labels](#):
`\section{Introduction}\label{sec:intro}`
 ... We saw in section `\ref{sec:intro}`...
- Automatic generation of [lists](#):
`\tableofcontents, \listoffigures, \listoftables`
- Automatic generation of [bibliographies](#) and [indices](#):
`\cite{Knuth:1976}... \bibliography{references.bib}`
 ...the Linux kernel `\index{Linux!kernel}`... `\printindex`
- Fully [hyperlinked](#) PDF with bookmarks: `\usepackage{hyperref}`
- Inclusion of selected pages from other PDFs
 (while inserting new page headers/footers!)
`\usepackage{pdfpages}`
`\includepdf[pages={1,3-5,8},pagecommand=\thispagestyle{plain}]{file.pdf}`

University Theses

Universiti Sains Malaysia `\documentclass{usmthesis}`WRITING YOUR THESIS WITH L^AT_EX

by

LIM LIAN TZE

Thesis submitted in fulfillment of the requirements
for the degree of
Master of Science

December 2007

TABLE OF CONTENTS

Acknowledgements	ii
Table of Contents	iii
List of Tables	iv
List of Figures	iv
List of Plates	iv
List of Abbreviations	iv
List of Symbols	iv
Abstract	v
Athors	vi

CHAPTER 1 - INTRODUCTION: SAMPLES OF BASIC L^AT_EX
COMMANDS

1.1 Basic Single Command Usage	1
1.2 Special Characters	3
1.3 Double Backslash	4

CHAPTER 2 - FONTS, TABLES AND BIBLIOGRAPHY

2.1 The "add" File	5
2.2 Creating using the scratch package	6
2.2.1 Author View System	6
2.2.2 Numeric System	7

CHAPTER 3 - FIGURES, TABLES, EQUATIONS, ALGORITHMS, ETC

3.1 Inserting Figures	8
3.2 Inserting Tables	12
3.3 Inserting Tables	12

iii

CHAPTER 1

INTRODUCTION: SAMPLES OF BASIC L^AT_EX
COMMANDS

Books and software: *Universiti Sains Malaysia (USM) research program*. The `usmthesis` package and template files were written in the hope that they may help you prepare your research thesis using L^AT_EX, based on the *Swedish Program Research (SPR)* components (SPR, 2007). **Please note that this version is based on the new guidelines, to be used 07 Dec 2007 onwards.** (Using Cit. Type and Cit. 2002)

L^AT_EX is powerful and produces beautiful documents. However, there is definitely a learning curve to it - one that is worth the effort. If you find any errors in these templates or documents, or have any suggestions or feedback, do e-mail me about it (liantze@usm.edu.my). The author cannot always guarantee prompt responses, however.

L^AT_EX, my recommended L^AT_EX distribution for Windows, is available on the CTAN/CTEX. A step-by-step installation walkthrough is available at (Lin, 2009).

1.1 Basic Single Command Usage

There are plenty of new L^AT_EX research notes, some of which are listed in the table. Templates are available at <http://www.usm.edu.my>. This template includes some examples to do some common tasks. We start with some examples for the first (table) but

1

REFERENCES

Changsheng, X., Wang, J., Lu, L. and Zhang, Y. (2008). A novel framework for scientific manuscripts and preformatted control of open tables. *Mathematics*, 2002. <https://doi.org/10.1155/2008/1221208>

D'Amico, T., Lee, M., Spagnolo, P., Marano, P. L., Menna, N., Nink, M. and Di Stefano, A. (2009). An investigation into the feasibility of real-time remote office education using a multi-touch system. *IEEE TRANSACTIONS ON SYSTEMS, MAN AND CYBERNETICS PART B: APPLIED COMPUTATIONAL INTELLIGENCE*, 39(3), 388-394.

D'Amico, T., Lee, M., Spagnolo, P., Nink, M., Menna, N. and Di Stefano, A. (2009). A virtual reality for real-time education of global students during course creation. *Computer Vision and Image Understanding*, 113(3), 422-432. Computer Vision and Image Understanding in Smart Environments. https://doi.org/10.1007/978-1-4419-0044-0_18

SPR (2007). *A Guide to the Preparation, Submission and Examination of Theses*. Institute of Distance Studies, Universiti Sains Malaysia, Penang, Malaysia.

Lin, L. T. (2009). *L^AT_EX: Beautiful Reports*. (Shenzhen) (Accessed January 22, 2010). Available from World Wide Web: <http://www.usm.edu.my/liantze/latex/>

Mishra, P., Grewson, M., Brown, J., Cuffield, D. and Rowley, C. (2004). *The L^AT_EX Companion*. Addison Wesley, Boston, MA, USA.

Delella, T., Paul, H., Hesse, J. and Koblitz, R. (2008). *The User's Reference Manual*. https://doi.org/10.1007/978-1-4419-0044-0_18

Robins, A. (2005). *Getting to grips with L^AT_EX (E²T_X)*. (Accessed January 22, 2010). Available from World Wide Web: <http://www.usm.edu.my/liantze/latex/>

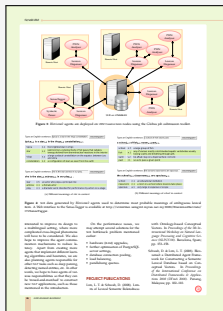
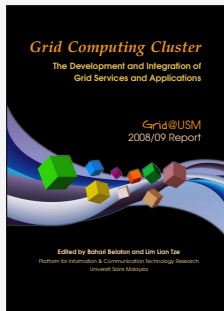
Song, J. Q., Cai, M., Luo, M. H. and Cai, S. J. (2002). A new approach for line recognition in large size images using rough methods. *Proceedings of the 2002 International Conference on Pattern Recognition*, Vol. 1, pp. 39-46.

22

Highly Configurable Documents

memoir and KOMA-Script Classes

- Sectional headings
- Running headers and footers
- Good font, colour and illustration choices
- <http://latex-my.blogspot.com/search/label/bookdesign>



Presentation Slides

- This presentation was made with L^AT_EX!
- Many possible classes: powerdot, **beamer**

```

\documentclass{beamer}
\usetheme{Warsaw}

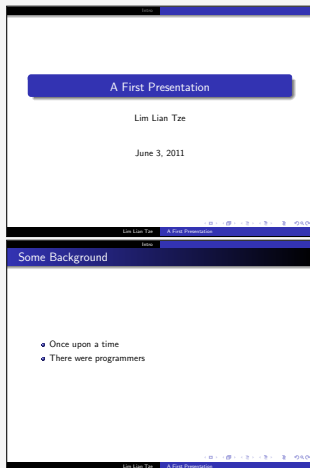
\author ...

\begin{document}
\titleframe

\section{Intro}

\begin{frame}
\frametitle{Some Background}
...
\end{frame}
\end{document}

```



Oversized Posters

- Many possible solutions:
scipooster, flowfram, **beamerposter**, tikzposter

```

\documentclass{beamer}
\usepackage[orientation=portrait,
↪ size=a0]{beamerposter}
\usetheme{...}
\author ... % Meta-information

\begin{document}
\begin{frame}
... % Poster contents goes here
\end{frame}
\end{document}

```

Low-Cost Construction of a Multilingual Lexicon from Bilingual Lists

Introduction

- Bilingual MTs are good resources for building multilingual lexicons, but heterogeneous structures
- Lowest common denominator: list of source language item → target language item(s)
- Proposal: Multilingual lexicon construction using only simple bilingual lists

One-time Inverse Consultation [1]

- Generates a bilingual lexicon for new language pair from existing bilingual lists
- JP-EN, EN-MS, MS-EN lexicons → JP-MS

Japanese → English → Malay

$$\text{score}(\text{bars}) = 2 \times \frac{|E_1 \cap E_2|}{|E_1| + |E_2|} = 2 \times \frac{2}{3+4} = 0.57$$

$$\therefore \text{"P"} \leftrightarrow \text{Beratin most likely valid}$$

Merging Translation Triples into Sets

- (Example: Malay-English-Chinese)
- Retain OTC 'middle' language links
- For each 'head' language L_i , discard triples with score $< \alpha X$ or $\text{score}^* < \beta X$, where $X = \text{max score of all triples containing that } L_i$

Adding a New Language

- (Example: Malay-English-Chinese + French)
- Construct also French-English-Malay triples
- Add French members to existing M-E-C clusters with common English & Malay members

Precision of 100 Random Translation Sets

Precision generally around 0.70-0.82; max 0.85

F₁ and Rand Index of Selected Translation Sets

Evaluating accuracy of sets with polysemous 'middle' language members, e.g. 甘密 (甘蜜) (Ganyam)

Test	Rand Index	F ₁	Best accuracy when word	α	β
甘蜜	0.817	0.611	0.538	0.62	0.6
甘密	0.818	0.927	0.809	0.913	0.6
甘蜜	0.821	1.000	0.992	1.000	0.6
甘蜜	0.709	0.818	0.728	0.792	0.8


Discussion and Conclusion

- Low thresholds (α, β): more coverage, low precision
- High thresholds: good precision, low coverage
- $\alpha = 0.6, \beta = 0.2$ gives good trade-off between coverage, precision and recall
- Results are encouraging for such simple input data!
- Future plans: integrate lexicon into an MT system with WSD

References

[1] F. Bond and K. Ogura, "Combining linguistic resources to create a machine-translatable Japanese-Malay Dictionary," in *Language Resources and Evaluation* 42 (2008), pp. 107-116.

Lian Tze Lim, Bali RANAIVO-MALANÇON, Enya KONG TANG
 lian@ipm.gov.my | ranaivo@ipm.gov.my | enya@ipm.gov.my
 Institute of Information Technology, Multimedia University, Malaysia



Leaflets

- leaflet: arrange contents into 6 pages on a foldable double-sided sheet

```

\documentclass[foldmark,a4paper]
{leaflet}
\author ... % Meta-information

\begin{document}
\maketitle
\section ...
... % Leaflet contents
\end{document}
    
```

References

- 1. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 2. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 3. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 4. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>

Meta-Information

- 1. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 2. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 3. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 4. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>

References

- 1. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 2. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 3. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 4. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>

Meta-Information

- 1. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 2. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 3. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>
- 4. Lee, H. (2010). *Leaflet: a new document class*. Retrieved from <http://www.ctan.org/ctan/latex/leaflet/>

Low-Cost Construction of a Multilingual Lesson from Bilingual Lists

Lian Tze Lim
 EdS, EdM, EdD, EdS, EdD
 NIE, Singapore
 EdS, EdM, EdD, EdS, EdD
 NIE, Singapore

Introduction

- 1. Bilingual lists are good resources for building multilingual lessons.
- 2. The lists have been used in various ways (e.g., as a source of content, as a source of language, as a source of structure).
- 3. Current research has shown that bilingual lists can be used to build multilingual lessons.

How to Use Bilingual Lists

- 1. Bilingual lists can be used to build multilingual lessons.
- 2. Bilingual lists can be used to build multilingual lessons.
- 3. Bilingual lists can be used to build multilingual lessons.

Adding Translation Tables into Sets

- 1. Add translation tables into sets.
- 2. Add translation tables into sets.
- 3. Add translation tables into sets.

Applying to Language Learning: A Case Study

1. Apply to language learning: a case study.

2. Apply to language learning: a case study.

3. Apply to language learning: a case study.

Practicality of 100 Random Translation Sets

1. Practicality of 100 random translation sets.

2. Practicality of 100 random translation sets.

3. Practicality of 100 random translation sets.

Adding More Languages

- 1. Add more languages.
- 2. Add more languages.
- 3. Add more languages.

Applying to Language Learning: A Case Study

1. Apply to language learning: a case study.

2. Apply to language learning: a case study.

3. Apply to language learning: a case study.

Practicality of 100 Random Translation Sets

1. Practicality of 100 random translation sets.

2. Practicality of 100 random translation sets.

3. Practicality of 100 random translation sets.

Fillable PDF Forms

```

\usepackage{hyperref}
... % various settings skipped
\TextField{Name:}
\TextField{Affiliation:}
\ChoiceMenu[radio=true]
{Are you a:}{Student, Academic}
Interest:
\CheckBox{Security}
\CheckBox{Systems}
\CheckBox{User space}
\TextField[multiline=true]
{Comments:}

```

The screenshot shows a PDF viewer window titled "HelloFormus - PDF-XChange Viewer". The form content is as follows:

Feedback Form

Name:

Affiliation:

Are you a: Student Academic

Interests: Security Systems User space

Comments:

The viewer interface includes a menu bar (File, Edit, View, Document, Comments, Tools, Window, Help), a toolbar with icons for Open, Save, Print, etc., and a status bar at the bottom showing "6.50 x 11.00 in" and "1 of 1" pages.

Fillable PDF Forms (cont'd)

Use with caution!

- poppler-based viewers (evince, xpdf, okular)
 - Problem displaying and saving radio/check boxes correctly
 - Saved forms can't be opened by other viewers
- Adobe Reader
 - Cannot save filled form as PDF unless Acrobat is installed
 - Only as field-and-value text file
 - Can provide “Submit” button for submission to a URL
 - Or print hard copy of filled form!
- PDF XChange Viewer
 - Best freeware for filling and saving L^AT_EX-created forms
 - Windows only
 - Not OSS

Flash Cards

```

\documentclass[avery5388,frame]
{flashcards}
\cardfrontstyle{headings}
\cardfrontfoot{Linux}

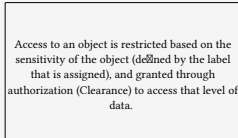
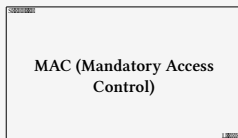
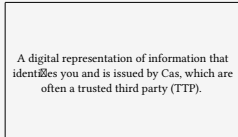
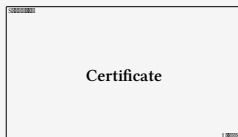
\begin{document}
\begin{flashcard}[Security]
{Certificate}

...
\end{flashcard}

\begin{flashcard}[Security]
{MAC ...}

...
\end{flashcard}
\end{document}

```



Examination Paper

```

\documentclass{exam}
...
\begin{questions}\printanswers
\question[5]
What is Paul McCartney's middle name?
\begin{oneparchoices}
\choice John \CorrectChoice Paul
\choice Ringo \choice James
\end{oneparchoices}

\question[10] What was the Beatles' first
↪ single in 1962?
\begin{solution}Love Me Do\end{solution}

\question
\begin{parts}
\part[5] What was George's inspiration for
↪ `While My Guitar Gently Weeps'?
\begin{solution}
He opened a random book and saw the words
↪ ``gently weep''.
\end{solution}
...
\end{questions}

```

1. What is Paul McCartney's middle name? (5)
A. John **B. Paul** C. Ringo D. James
2. What was the Beatles' first single in 1962? (10)

Solution: Love Me Do

3. (a) What was George's inspiration for 'While My Guitar Gently Weeps'? (5)
- (b) Who guest-performed for the song and why? (5)

Solution: He opened a random book and saw the words "gently weep".

Solution: Eric Clapton; he wanted a spiffy guitar solo.

Contents

1 What are TeX, LaTeX and Friends?

2 Document Types

3 Special Material

4 Wrapping Up

Mathematics

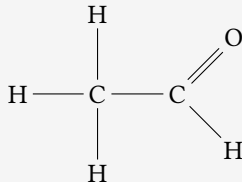
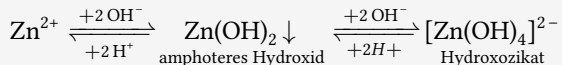
(1) relates the golden ratio and the Fibonacci series.
Recall that the golden ratio, $\varphi = \frac{1}{2}(1 + \sqrt{5})$.

$$\varphi = 1 + \sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{F_n F_{n+1}} \quad (1)$$

`\eqref{eq:gratio}` relates the golden ratio and the Fibonacci series.
Recall that the golden ratio, `\$ \phi = \frac{1}{2} (1 + \sqrt{5}) \$`.

```
\begin{equation}\label{eq:gratio}
\phi = 1 + \sum^{\infty}_{n=1}
\frac{(-1)^{n+1}}{F_n F_{n+1}}
\end{equation}
```

Chemical Equations and Molecules



```
\usepackage[version=3]{mhchem}    % sufficient for chemical equations
```

```
\usepackage{chemfig}            % for 2-D molecule drawings
```

```
...
```

```
\ce{Zn^2+ <=> [\ce{+ 2OH-}][\ce{+ 2H+}]}
```

```
\underset{\text{amphoterer Hydroxid}}{\ce{Zn(OH)2 v}}$
```

```
<=> C[+2OH-][+ 2H+]
```

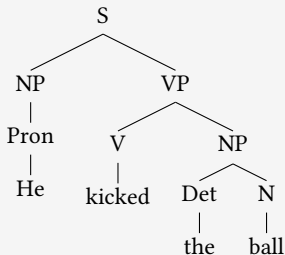
```
\underset{\text{Hydroxozikat}}{\ce{[Zn(OH)4]^2-}}$ }
```

```
\chemfig{H-C(-[2]H)(-[6]H)-C(-[7]H)=[1]O}
```

Linguistics

- (1) *%*Wen liebt seine Mutter?*
 Whom loves his mother
 'Who does his mother

```
\usepackage{linguex, qtree}
...
\ex
\beginl
\gla \%*Wen liebt seine Mutter?//
\glb Whom loves his mother//
\glc `Who does his mother love?'//
\endgl
\xe
```



```
\usepackage{qtree}
...
\Tree [ .S [ .NP [ .Pron He ] ] [ .VP
↪ [ .V kicked ] [ .NP [ .Det the ] [ .
↪ N ball ] ] ] ] ]
```


Program Listings

```

\usepackage{listings,xcolor}
...
\begin{lstlisting}
[language=C,columns=fullflexible,
basicstyle=\ttfamily,
keywordstyle=\bfseries\color{red},
commentstyle=\sffamily\color{green},
stringstyle=\rmfamily\color{orange}]
#include <stdio.h>
/*
 | Prints "hello world"
*/
int main(void)
{
    printf("hello, world\n");
    return 0;
}
\end{lstlisting}

```

```

#include <stdio.h>

/*
 | Prints "hello world"
*/
int main(void)
{
    printf("hello, world\n");
    return 0;
}

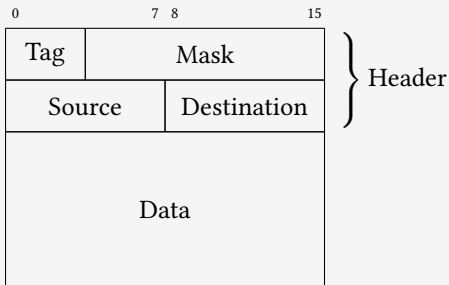
```

Network Protocols

```

\usepackage{bytefield}
...
\begin{bytefield}{16}
\bitheader{0,7,8,15} \\
\begin{rightwordgroup}{Header}
\bitbox{4}{Tag} & \bitbox{12}{Mask} \\
\bitbox{8}{Source} &
\bitbox{8}{Destination}
\end{rightwordgroup} \\
\wordbox{3}{Data}
\end{bytefield}

```



Life Sciences

first case (see text)

AQP1.PRO	TLGLL	SCQI	SLRAVM	YIIAQ	CVGAI	VASAIL	112
AQP2.PRO	TVA	CLVGCH	VSFLRAAF	FVVAQ	LLGAV	AGAIL	104
AQP3.PRO	TFAM	CFLAREP	WIKLPI	YTLAQ	TLGAF	LGAGIV	112
AQP4.PRO	TVAM	CTRK	ISIAKSV	FYITAQ	CLGAI	IGAGIL	133
AQP5.PRO	TLALL	IGNQ	ISLLRAVF	YVAQ	LVGAI	AGAGIL	105

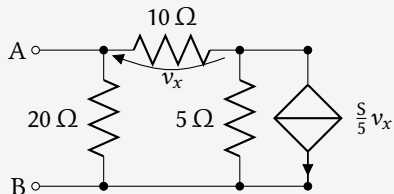
second case (see text)

```

\usepackage{texshade} % for nucleotide and peptide alignments
...
\begin{texshade}{AQPpro.MSF.txt}
\shadingmode{similar}
\threshold[80]{50}
\setends{1}{80..112}
\hideconsensus
\feature{top}{1}{93..93}{fill:\downarrow}{first case (see text)}
\feature{bottom}{1}{98..98}{fill:\uparrow}{second case (see text)}
\end{texshade}

```

Circuits and SI Units



- $3.45 \times 10^4 \text{ V}^2 \text{ lm}^3 \text{ F}^{-1}$
- 40 km/h, 85 km/h and 103 km/h

```

\usepackage{siunitx}
\usepackage[siunitx]{circuitikz}
...
\begin{circuitikz}
\draw (0,0) node[anchor=east] {B}
  to[short, o-*] (1,0)   to[R=20<\ohm>, *-*) (1,2)
  to[R=10<\ohm>, v=$v_x$] (3,2) -- (4,2)
  to[ cI=$\frac{\si{\siemens}}{5} v_x$, *-*) (4,0) -- (3,0)
  to[R=5<\ohm>, *-*) (3,2)
  (3,0) -- (1,0)   (1,2) to[short, -o] (0,2) node[anchor=east]{A}
;\end{circuitikz}

\SI{3.45d4}{\square\volt\cubic\lumen\per\farad}
\SIlist[per-mode=symbol]{40;85;103}{\kilo\metre\per\hour}

```

Meh, What Good is That? Can't Use it Anywhere Else.

Actually, you can.

```
\usepackage[active,tightpage]{preview}
\PreviewEnvironment{texshade}
...
\begin{texshade}
...
\end{texshade}
```

- Run `pdflatex` → cropped PDF containing *only* contents of `texshade`
- ImageMagick: `convert -depth 150 texshade.pdf texshade.png`
- Multiple environments → multi-page PDF and multiple PNGs

Bar Codes

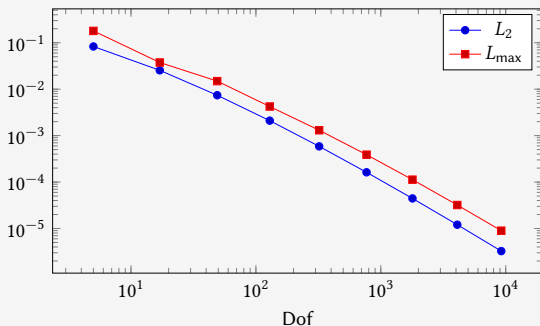


```

\usepackage{auto-pst-pdf} % Needed if running pdflatex; must use option -shell-escape
\usepackage{pstricks,psbarcode}
...
\begin{pspicture}
\psbarcode{MECARD:N:Malaysia Open Source Conference...}{eclevel=L}{qr}
\psbarcode{9781860742712}{includetext guardwhitespace}{ean13}
\psbarcode{978-3-86541-114}{includetext guardwhitespace}{isbn}
\psbarcode{LE28HS9Z}{includetext}{royalmail}
\psbarcode{^453^178^121^239}{columns=2 rows=10}{pdf417}
\end{pspicture}

```

Graph Plots



```

\usepackage{pgfplots}
...
\begin{tikzpicture}
\begin{loglogaxis}[xlabel=Dof]
\addplot table[x=dof,y=L2]{datafile.dat}; \addlegendentry{$L_2$};
\addplot table[x=dof,y=Lmax]{datafile.dat}; \addlegendentry{$L_{\text{max}}$};
\end{loglogaxis}
\end{tikzpicture}

```

Spreadsheets

(Seriously, use a proper spreadsheet application for complex stuff.)

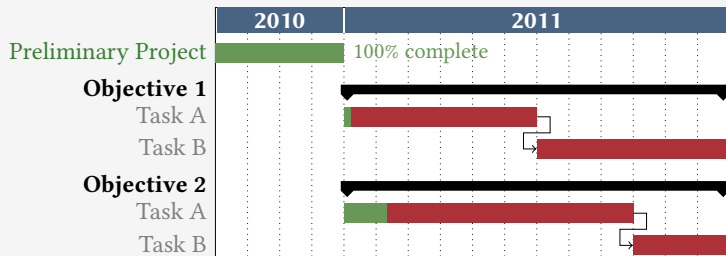
Year ending Mar 31	2009	2008	2007
Revenue	14580.20	11900.40	8290.30
Cost of sales	6740.20	5650.10	4524.20
<i>Gross profit</i>	7840.00	6250.30	3766.10

```

\STautoround*{2}
\begin{spreadtab}{{tabular}{l rrr}}
@Year ending Mar 31 & @2009 & @2008 & @2007\\ \hline
@Revenue & 14580.2 & 11900.4 & 8290.3\\
@Cost of sales & 6740.2 & 5650.1 & 4524.2\\ \cline{2-4}
@\emph{Gross profit} & \STcopy{>}{b2-b3} & & \\ \cline{2-4}
\end{spreadtab}

```


Gantt Charts

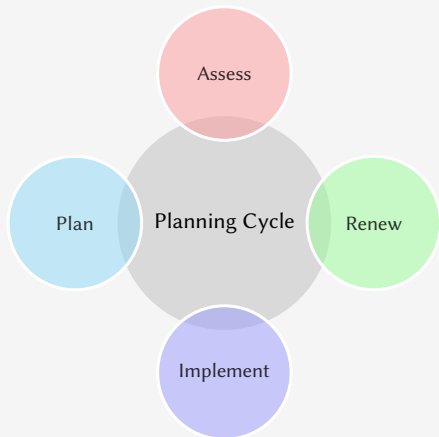


```

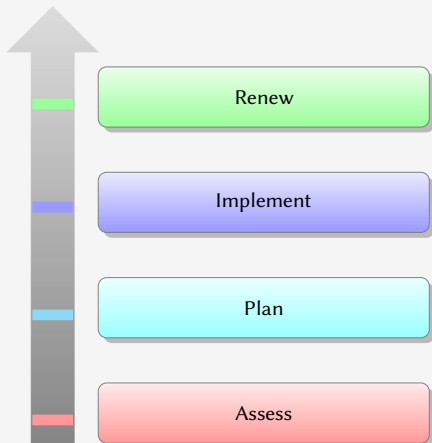
\usepackage{pgfgantt}
...
\begin{ganttchart}[...settings...]{1}{16}
\gantttitle{2010}{4} \gantttitle{2011}{12} \\
\ganttbar[progress=100]{Preliminary Project}{1}{4} \\
\ganttgroup{Objective 1}{5}{16} \\
\ganttbar[progress=4, name=T1A]{Task A}{5}{10} \\
\ganttlinkedbar[progress=0]{Task B}{11}{16} \\
...
\end{ganttchart}

```

'Smart Diagrams'



```
\usepackage{smartdiagram}
\smartdiagram[bubble diagram]{
  Planning Cycle,Assess,Plan,
  Implement,Renew}
```



```
\usepackage{smartdiagram}
\smartdiagram
 [priority descriptive diagram]{
  Assess,Plan,Implement,Renew}
```

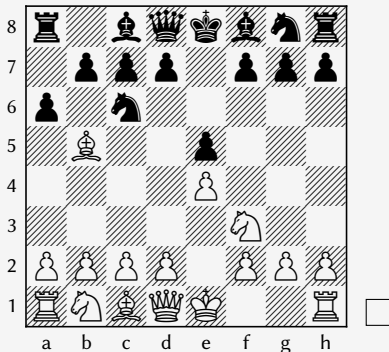
Chess games

```

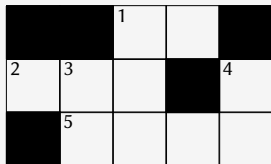
\usepackage[skaknew]%
{skak, chessboard}
...
\newgame
\mainline{1. e4 e5 2. Nf3 Nc6 3.
↪Bb5 a6}
\chessboard[smallboard]

```

1 e4 e5 2 ♞f3 ♞c6 3 ♝b5 a6



Crossword Puzzles



Across: 1 unit of measure
2 * 5 sectioning unit

Down: 1 η 3 unit of measure
4 nonproportional font

```

\usepackage{cwpuzzle}
...
\begin{Puzzle}{5}{3}
|* |* |[1]E|X |* |.
|[2]A|[3]S|T |* |[4]T|.
|* |[5]P|A |R |T |.
\end{Puzzle}
\begin{PuzzleClues}{
\textbf{Across:} }
\Clue{1}{EX}{unit of measure}
\Clue{2}{AST}{\(\ast\)}
\Clue{5}{PART}{sectioning unit}
\end{PuzzleClues}
\begin{PuzzleClues}{
\textbf{Down:} }
\Clue{1}{ETA}{\(\eta\)}
\Clue{3}{SP}{unit of measure}
\Clue{4}{TT}{nonproportional font}
\end{PuzzleClues}

```

Song Books with Guitar Tabs



C



G



Am



F

Country road, take me home, to the place I belong.



C



G



F



C

West Virginia, mountain momma, take me home, country road.

```
\usepackage{gchords,guitar}
```

```
...
```

```
\begin{guitar}
```

```
\newcommand{\CMaj}{\chord{t}{n,p3,p2,n,p1,n}{C}}
```

```
\newcommand{\Amin}...
```

```
Country [\CMaj]road, take me [\GMaj]home, ...
```

```
\end{guitar}
```

Contents

1 What are T_EX, L^AT_EX and Friends?

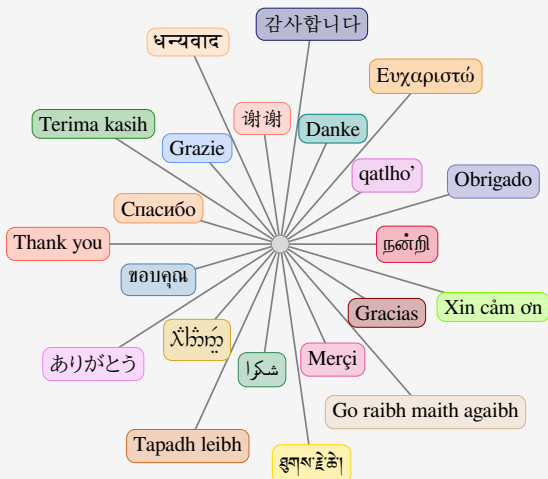
2 Document Types

3 Special Material

4 Wrapping Up

Summary

- L^AT_EX
 - a document preparation system
 - professional quality typesetting output
- Output artefacts
 - Academic: papers, theses, books
 - Dedicated document types
 - Domain-specific material
- Usage scenario
 - Direct authoring
 - Automatic generation (via scripts etc)
 - As back-end of other applications



Questions?

liantze@gmail.com, support@overleaf.com
<http://tex.stackexchange.com>

Want to download this deck?

