



Introductory Workshop to \LaTeX

Lim Lian Tze

`liantze@gmail.com`

`lim.lian.tze09@mmu.edu.my`



NLP-SIG CMKP

Faculty of Information Technology
Multimedia University, Malaysia

8 March, 2010



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers



Concerns when writing a paper/thesis...



- Is my lit survey strong enough to support my hypothesis?
- 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?
- How do I fit/split this huge table on/across page(s)?
- My figure jumped off the page again!
- The application crashed!
- **MY FILE WAS CORRUPTED!!!**



What is \LaTeX ?



- Donald Knuth created \TeX = TeX (from Greek $\tau\epsilon\chi\nu\eta$ ‘art’, ‘craft’)
 - pronounced ‘tech’, like Scottish ‘loch’
 - a computer typesetting system
 - for “the creation of beautiful books”
- Leslie Lamport wrote \LaTeX = LaTeX = “Layman’s \TeX ”
 - pronounced ‘lay-tech’ or ‘lah-tech’
 - a document preparation system: plain text + markup
 - a macro package on top of \TeX
 - **separation of content and style**
- Preferred by many academic journals
- Many, many “distros” (TeXLive, MiKTeX, MacTeX...)
- More history at http://www.ctan.org/what_is_tex.html



- Typesetting quality & legibility
 - good kerning hinting and correct ligatures
 - inter-word, line and paragraph spacing
 - context-sensitive hyphenation
- Especially good at maths material

Table **fire flower fjörd**

Kerning and ligature examples from <http://nitens.org/taraborelli/latex>

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

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 **fire flower fjörd**

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

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.



Other Pros and Cons



Pros

- Free software + **Free-of-charge**
- Portable (plain text input; DVI/PS/PDF... output)
- Light, robust, secure, stable, consistent
- Supports multilingual typesetting, international characters
- Good for complex, structured documents or lots of maths
- Good for batch-processing jobs

Cons

- Learning curve
- Overkill for simple documents
- Not as suitable for graphic-intensive material (e.g. advertising)



Disclaimer



This is not a Word Processors vs \LaTeX debate.

- It's a hands-on demonstration 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.



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers



What to Install? (for Windows)



(FOC options here; commercial solutions *are* available)

- Essential

- **MiKTeX**: \LaTeX engine for Windows (includes \LaTeX -friendly editor and PDF previewer)

- Optional

- **JabRef**: Java-based GUI bibliography and reference manager
- **LaTable**: visual table editor to help with complex tables
- **GhostScript**, **GSView** if you work with PostScript outputs



Minimal Document Structure



```
%% helloworld.tex — First LaTeX document
```

```
\documentclass{article}
```

```
\begin{document}
```

```
Hello World!
```

```
\end{document}
```




- Standard document classes:
 - **article**: for short reports, articles in proceedings or journals, etc.
 - **book**: for real books.
 - **report**, **letter**, ...
- Other document classes: **beamer**, **scrartcl**, **memoir**, **recipe**, **resume**, **leaflet**, **exam**, **beamerposter**...

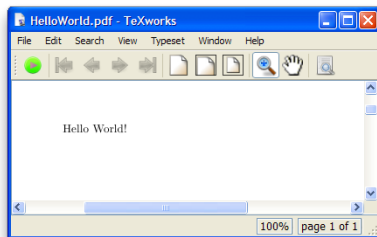
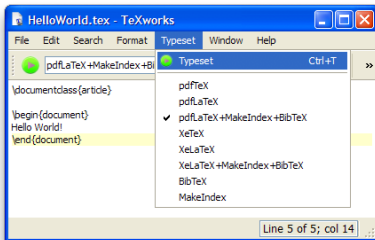



LaTeX Workflow

Worksheet Exercise 1



- 1 Create, edit, save .tex file
- 2 Make sure **Typeset** operation set to **pdfLaTeX+MakeIndex+BibTeX**
- 3 Typeset ( +  or )
- 4 Correct errors, repeat Typeset
- 5 View Output



Tip:  + click in source to jump to corresponding point in PDF (and vice versa)



■ Commands (0 or more options/arguments)

```
\cmdname[option1, option2...]{arg1}{arg2}...
```

■ Environments

```
\begin{envname}  
environment contents  
\end{envname}
```

■ Comments: the % character.

```
% You won't see this line in the output.  
You will see this line %<-- but nothing after this!
```



Another example



%%% document class declaration with options

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

%%%% document preamble starts...

%% loading packages: for extra capabilities

```
\usepackage{marvosym}
```

%% "meta" information and other definitions

```
\author{Lim Lian Tze}
```

```
\title{Hello}
```

%%%% document preamble ends, document body starts

```
\begin{document}
```

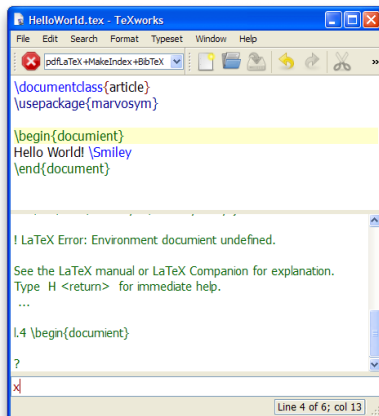
```
\maketitle
```





```
Hello World! \Smiley
```

```
\end{document}
```



Aarrgggh! Errors!



- Error message and line number in the **Output panel**
- In the **Console bar**:
 - Hit  (perhaps repeatedly) to continue anyway. May still get a PDF output but with erroneous content.
 - Hit  then , or click  to abort.
- Correct error, retry.



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 **Typesetting Text**
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers



White Space and New Lines



- Space and tab characters
 - White space does not (usually) matter
 - \TeX determines inter-word spacing to ensure legibility
- Paragraph breaking
 - Leave a blank line between text to break paragraph
 - Multiple blank lines won't give more vertical spacing
 - \TeX determines inter-line spacing to ensure legibility
- Manual line- and page-breaking?
 - (are you sure?)
 - \TeX decides where to break lines, pages to ensure legibility
 - if you insist: `\`, `\pagebreak`



Effects of White Space



```
1 This is to demonstrate % TODO: comments again!
2 typesetting plain text in \LaTeX. It doesn't care much about
3 multiple blank spaces and tabs.
4
5 ``Multiple blank lines'' have the same effect as one blank line.
6
7
8 Blank lines are for separating paragraphs (content), but not how
   far they are apart (style).
```

This is to demonstrate typesetting plain text in \LaTeX . It doesn't care much about multiple blank spaces and tabs.

“Multiple blank lines” have the same effect as one blank line.

Blank lines are for separating paragraphs (content), but not how far they are apart (style).



Special Characters



#	(hash, pound)	:	\#
\$	(dollar)	:	\\$
%	(percent)	:	\%
^	("hat")	:	\^{}
&	(ampersand)	:	\&
_	(underscore)	:	_
{	(left brace)	:	\{
}	(right brace)	:	\}
~	(tilde)	:	\~{}
~	(wide tilde)	:	\sim
"	(open double quotes)	:	`
"	(close double quotes)	:	'
@	(alias)	:	\string@



Verbatim text



```
1 \begin{verbatim}
2 "I'm tired of escaping characters!"
3 Type all the special characters you want, 100%!
4 No need to escape your # and $ and ^ here,
5 and it respects your line breaks
6     and whitespaces, too!
7 \end{verbatim}
8
9 Inline: \verb|mem_buffer|.
```

"I'm tired of escaping characters!"
Type all the special characters you want, 100%!
No need to escape your # and \$ and ^ here,
and it respects your line breaks
 and whitespaces, too!

Inline: mem_buffer.



URLs and File Paths



```
\usepackage{url} % this line in preamble!
```

```
...
```

You can find this presentation at `\url{http://liantze.googlepages.com/latextypesetting}`.

Your MiKTeX installation is most likely at `\path{C:\Program Files\MiKTeX 2.8\}`.

You can find these slides at `http://liantze.googlepages.com/latextypesetting`.

Your MiKTeX installation might be at `C:\ProgramFiles\MiKTeX2.8\`.

Windows paths often have space characters; use
`\usepackage[obeyspaces]{url}`.



Special Symbols



- Diacritic marks: e.g. à, á, â, ã, ä, å, æ
 - no input methods: `\`a`, `\'a`, `\^a`, `\~a`, `\"a`, `\r a`, `\ae`
 - with input methods: (TeXworks saves files as UTF-8 by default)

```
\usepackage[utf8]{inputenc}
\usepackage[T1]{fontenc}
...
àáâãäåæ
```

- Common text symbols: e.g. ©®™°C

```
\textcopyright \textregistered \texttrademark \textcelsius
```

- Mathematical symbols: a whole slew of them!





Special Symbols (cont'd)



- “How would I know what command produces symbol X”?

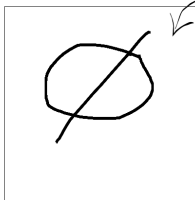
1 The Comprehensive L^AT_EX Symbol List

- Install the comprehensive package with MikTeX Package Manager
-   `Run... mthelp -view comprehensive`

2 Detexify (<http://detexify.kirelabs.org/>)

Detexify² - L^AT_EX symbol classifier

[classify](#) [symbols](#) [blog](#)



 What is this?

Did this help?

Hosting Detexify costs money and if it helps you may consider helping to pay the hosting bill.



Score: 48.8876262463213
\usepackage{textcomp}
`\textdiscount`
textmode



Score: 48.8876262463213
\usepackage{amssymb}
`\varnothing`
mathmode



Score: 48.8876262463213
\usepackage{wasysym}
`\clock`
textmode & mathmode



Score: 48.8876262463213
`\O`



Font Families and Effects



<code>\texttt{roman}</code>	→ roman
<code>\textsf{sans serif}</code>	→ sans serif
<code>\texttt{typewriter}</code>	→ typewriter

<code>\textbf{bold}</code>	→ bold
<code>\textit{italics}</code>	→ <i>italics</i>
<code>\underline{underline}</code>	→ <u>underline</u>
<code>\textsc{Small Caps}</code>	→ SMALL CAPS
<code>\emph{emphasis}</code>	→ <i>emphasis</i>

- Commands can be nested:

`\texttt{\emph{Like this.}}` → *Like this.*



Font Sizes



Font size changing commands relative to base font size given in `documentclass` option

<code>\tiny</code> Text	→ Text
<code>\scriptsize</code> Text	→ Text
<code>\footnotesize</code> Text	→ Text
<code>\small</code> Text	→ Text
<code>\normalsize</code> Text	→ Text
<code>\large</code> Text	→ Text
<code>\Large</code> Text	→ Text
<code>\LARGE</code> Text	→ Text
<code>\huge</code> Text	→ Text
<code>\Huge</code> Text	→ Text



List-like Environments



Bulleted Lists

```
\begin{itemize}
\item one
\item two
\end{itemize}
```

- one
- two

Numbered Lists

```
\begin{enumerate}
\item one
\item two
\end{enumerate}
```

1. one
2. two

Description Lists

```
\begin{description}
\item[one] is here
\item[two] is there
\end{description}
```

- one** is here
- two** is there

Lists can be nested up to 6 levels deep.



Worksheet Exercise 2



More on Changing Fonts



- Default document font: Computer Modern (designed by Knuth)
 - Computer Modern Sans Serif
 - Computer Modern Serif
 - Computer Modern Typewriter
- Use Times Roman + Helvetica + Courier as default:

```
\usepackage{mathptmx}  
\usepackage[scaled=.89]{helvet} % Helvetica is LARGE  
\usepackage{courier}
```

- Other fonts can be loaded via relevant packages
(<http://www.tug.dk/FontCatalogue/>)
- But be careful about improper font combinations!



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers



Sectioning Commands



- `article`: section, subsection, subsubsection.
- `book`: part (not usually used), chapter, section, ...

```
\documentclass{article}

\begin{document}
\section{Introduction}
Introduce your topic here.

\section{Background}
A line or two.

\subsection{Related Work}
Review others' work.

\subsection{Problems}
Unresolved issues.
\end{document}
```

1 Introduction

Introduce your topic here.

2 Background

A line or two.

2.1 Related Work

Review others' work.

2.2 Problems

Unresolved issues.



Cross-referencing



```
\documentclass{article}
\begin{document}
\section{Introduction}\label{sec:intro}
Introduce your topic here.

\section{Background}
\label{sec:background}
Mention section \ref{sec:intro} again.

\subsection{Related Work}
\label{sec:related}
Review others' work.

\subsection{Problems}
\label{sec:problems}
In section \ref{sec:related} on page
\pageref{sec:related}\ldots
\end{document}
```

“Bookmark” with `\label`, reference
with `\ref`, `\pageref`

1 Introduction

Introduce your topic here.

2 Background

Mention section 1 again.

2.1 Related Work

Review others' work.

2.2 Problems

In section 2.1 on page 1...



- Author information (in preamble)
 - `\author`: Name(s) of authors
 - `\title`: Title of the article/book/report
 - `\date`: Specify a date
 - Other custom fields for respective journals, conference styles (see later)
- Routine tasks (in document body)
 - Abstract:

```
\begin{abstract}  
My abstract text here.  
\end{abstract}
```



Other Goodies (cont'd)



- Footnote: ...why? `\footnote{why not?}`
- Margin notes: ...why? `\marginpar{why not?}`
- Auto-generate title: `\maketitle`
- Auto-generate TOC: `\tableofcontents`
(`\listoffigures`, `\listoftables` – we'll try later)
- Try `\documentclass{scrartcl}` for a “modern” look
- Non-English: e.g. `\usepackage[bahsam]{babel}`
(Remove aux files before typesetting if you modify this line!)
- PDF hyperlinks and bookmarks: `hyperref` package



Worksheet Exercise 3



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 **Typesetting Mathematics**
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers



Mathematics with amsmath package

Worksheet Exercise 4



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

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

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

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

Source: <http://mathworld.wolfram.com/GoldenRatio.html>



... Too much “treasure” to describe here!



- <http://en.wikibooks.org/wiki/LaTeX/Mathematics>
- <http://www.andy-roberts.net/misc/latex/latextutorial9.html>, [latextutorial10.html](http://www.andy-roberts.net/misc/latex/latextutorial10.html)
- Various symbols, operators: check the Comprehensive Symbol List



Another Maths Example

(Wolfram's MathWorld Article on Wavelets)



[...] A family of wavelets can be constructed from a function $\psi(x)$, sometimes known as a “mother wavelet,” which is confined in a finite interval. “Daughter wavelets” $\psi^{a,b}(x)$ are then formed by translation (b) and contraction (a). [...]

An individual wavelet can be defined by

$$\psi^{a,b}(x) = |a|^{-\frac{1}{2}} \psi\left(\frac{x-b}{a}\right).$$

Then

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

and Calderón's formula gives

$$f(x) = C_{\psi} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \langle f, \psi^{a,b} \rangle \psi^{a,b}(x) a^{-2} da db.$$

A common type of wavelet is defined using Haar functions.

Source: <http://mathworld.wolfram.com/Wavelet.html>



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables**
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers



Graphics File Format



pdf_latex embeds JPG, PNG and PDF graphic files

```
\usepackage{graphicx}  
...  
\includegraphics[width=.3\textwidth]{MMU}
```

(no file extension → automatically looks for .jpg, .png, .pdf)



Other ways to specify the size:

width=5cm, height=120mm, scale=1.1 ...



Figures



```
\begin{figure}[hbt!]\centering
\includegraphics[width=.3\textwidth]{MMU}
\caption{MMU's logo}
\label{fig:mmu:logo}
\end{figure}
```

Figure `\ref{fig:mmu:logo}` depicts MMU's logo.



Figure 1: MMU's logo

Figure 1 depicts MMU's logo.



Tabular Material



```
\begin{tabular}{| l | c || r |}
\hline
one      &   two two      & three three tree \\ \hline
one one & two two two    & three              \\ \hline
one one one & two      & three three      \\ \hline
\multicolumn{2}{|l||}{In the end} & What?!           \\ \hline
\end{tabular}
```

one	two two	three three tree
one one	two two two	three
one one one	two	three three
In the end		What?!

Prefer a visual editor? Try LaTeX

(<http://tug.ctan.org/tex-archive/support/latable/>)



Tables



```
\begin{table}[hbt!]\centering
\caption{Sample table}\label{tab:sample}
\begin{tabular}{| l | c || r |}
\hline
one & two two & three three tree \\ \hline
one one & two two two & three \\ \hline
\end{tabular}
\end{table}
```

Table `\ref{tab:sample}` is a very simple example.

Table 1: Sample table

one	two two	three three tree
one one	two two two	three

Table 1 is a very simple example.



Worksheet Exercise 5



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References**
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers

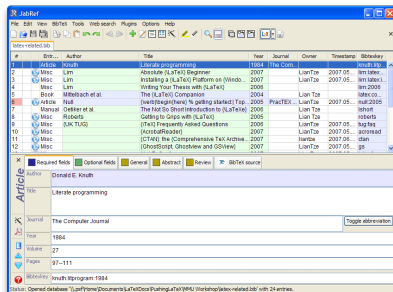


External (Centralised) Reference Database



latex-refs.bib

```
@ARTICLE{knuth:1984,
  author = {Donald E. Knuth},
  title = {Literate programming},
  journal = {The Computer Journal},
  year = {1984},
  volume = {27},
  number = {2},
  pages = {97--111},
  address = {Oxford, UK},
  publisher = {Oxford University
    Press}
}
```



JabRef: Java-based reference manager
<http://jabref.sourceforge.net>



Citing from External .bib File



```
\documentclass{article}
\bibliographystyle{plain}
\begin{document}
\cite{latex:companion} is a useful book. Knuth introduced
the literate programming paradigm while developing \TeX
\ \cite{knuth:1984}.
\bibliography{latex-refs}
\end{document}
```



Citation & Bibliography Styles

Number System



plain

[2] is a useful book. Knuth introduced the literate programming paradigm while developing \TeX [1].

References

- [1] Donald E. Knuth. Literate programming. *The Computer Journal*, 27(2):97–111, 1984.
- [2] Frank Mittelbach, Michel Goossens, Johannes Braams, David Carlisle, and Chris Rowley. *The \LaTeX Companion*. Addison-Wesley Series on Tools and Techniques for Computer Typesetting. Addison-Wesley, Boston, MA, USA, 2nd edition, 2004.

unsrt

[1] is a useful book. Knuth introduced the literate programming paradigm while developing \TeX [2].

References

- [1] Frank Mittelbach, Michel Goossens, Johannes Braams, David Carlisle, and Chris Rowley. *The \LaTeX Companion*. Addison-Wesley Series on Tools and Techniques for Computer Typesetting. Addison-Wesley, Boston, MA, USA, 2nd edition, 2004.
- [2] Donald E. Knuth. Literate programming. *The Computer Journal*, 27(2):97–111, 1984.

acm

[2] is a useful book. Knuth introduced the literate programming paradigm while developing \TeX [1].

References

- [1] KNUTH, D. E. Literate programming. *The Computer Journal* 27, 2 (1984), 97–111.
- [2] MITTELBACH, F., GOOSENS, M., BRAAMS, J., CARLISLE, D., AND ROWLEY, C. *The \LaTeX Companion*, 2nd ed. Addison-Wesley Series on Tools and Techniques for Computer Typesetting. Addison-Wesley, Boston, MA, USA, 2004.

ieeetr

[1] is a useful book. Knuth introduced the literate programming paradigm while developing \TeX [2].

References

- [1] F. Mittelbach, M. Goossens, J. Braams, D. Carlisle, and C. Rowley, *The \LaTeX Companion*. Addison-Wesley Series on Tools and Techniques for Computer Typesetting, Boston, MA, USA: Addison-Wesley, 2nd ed., 2004.
- [2] D. E. Knuth, “Literate programming,” *The Computer Journal*, vol. 27, no. 2, pp. 97–111, 1984.



Citation & Bibliography Styles

Author-Year System



alpha

[MGB⁺04] is a useful book. Knuth introduced the literate programming paradigm while developing T_EX [Knu84].

References

[Knu84] Donald E. Knuth. Literate programming. *The Computer Journal*, 27(2):97–111, 1984.

[MGB⁺04] Frank Mittelbach, Michel Goosens, Johannes Braams, David Carlisle, and Chris Rowley. *The L^AT_EX Companion*. Addison-Wesley Series on Tools and Techniques for Computer Typesetting. Addison-Wesley, Boston, MA, USA, 2nd edition, 2004.

agsm (with natbib package)

(Mittelbach et al. 2004) is a useful book. Knuth introduced the literate programming paradigm while developing T_EX (Knuth 1984).

References

Knuth, D. E. (1984). 'Literate programming', *The Computer Journal* **27**(2), 97–111.

Mittelbach, F., Goosens, M., Braams, J., Carlisle, D. & Rowley, C. (2004). *The L^AT_EX Companion*, Addison-Wesley Series on Tools and Techniques for Computer Typesetting, 2nd edn, Addison-Wesley, Boston, MA, USA.

apacite (with apacite package)

(Mittelbach, Goosens, Braams, Carlisle, & Rowley, 2004) is a useful book. Knuth introduced the literate programming paradigm while developing T_EX (Knuth, 1984).

References

Knuth, D. E. (1984). Literate programming. *The Computer Journal*, 27(2), 97–111.

Mittelbach, F., Goosens, M., Braams, J., Carlisle, D., & Rowley, C. (2004). *The L^AT_EX companion* (2nd ed.). Boston, MA, USA: Addison-Wesley.

dcu (with natbib package)

(Mittelbach et al.; 2004) is a useful book. Knuth introduced the literate programming paradigm while developing T_EX (Knuth; 1984).

References

Knuth, D. E. (1984). Literate programming, *The Computer Journal* **27**(2): 97–111.

Mittelbach, F., Goosens, M., Braams, J., Carlisle, D. and Rowley, C. (2004). *The L^AT_EX Companion*, Addison-Wesley Series on Tools and Techniques for Computer Typesetting, 2nd edn, Addison-Wesley, Boston, MA, USA.



Worksheet Exercise 6



natbib: Flexible Citations



■ Recommended:

- `\usepackage{natbib}` for author-year styles
- `\usepackage{apacite}\bibliographystyle{apacite}`

■ natbib citation commands:

`\citep{knuth:1984}` → (Knuth, 1984)

`\citet{knuth:1984}` → Knuth (1984)

(Carefull! `\cite` becomes `\citet` if using `natbib`!)

`\citep[section 2.1]{knuth:1984}` → (Knuth, 1984, section 2.1)

`\citeauthor{knuth:1984}` → Knuth

`\citeyear{knuth:1984}` → 1984

■ (apacite supports `\citeauthor` and `\citeyear` too)

■ See also

http://en.wikibooks.org/wiki/LaTeX/Bibliography_Management



Notes about Names



`author = {John Doe}` \rightarrow (Doe, 2002)
`author = {J. Doe}` \rightarrow (Doe, 2002)
`author = {Doe, John}` \rightarrow (Doe, 2002)
`author = {John von Neumann}` \rightarrow (von Neumann, 1945)
`author = {Lim Lian Tze}` \rightarrow (Tze, 2004)
`author = {Lim, Lian Tze}` \rightarrow (Lim, 2004)

`author = {John Doe and Allen Smith and Lee, Ai Chong}`
 \rightarrow (Doe, Smith and Lee, 2003)



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals**
- 9 Presentation Slides
- 10 Teasers



ACM SIG Proceedings

Always refer to your conference organiser where to get required templates



- (`sig-alternate.cls` seems to be the more popular choice)
- <http://www.acm.org/sigs/publications/proceedings-templates>
- Download the template required by your conference organiser (Choose Option 2 for this example)
- Put `sig-alternate.cls` in the same path as your `.tex` file (There are other ways of manually adding/installing packages system-wide, but we won't discuss them today)
- Learn-by-example from `sig-alternate.tex` and `sig-alternate.pdf`
- ACM Computing Classification System: Categories, General Terms
<http://www.acm.org/about/class/1998/>



ACM SIG Proceedings

Basic Example; Worksheet Exercise 7.1



```
\documentclass{sig-alternate}

\conferenceinfo{\LaTeX\ Workshop}{2010 Cyberjaya, Malaysia}
\CopyrightYear{2010}
\crdata{0-12345-67-8/90/AB}

\numberofauthors{2}
\author{
  \alignauthor Lian Tze Lim\\
  \affaddr{Multimedia University}\\
  \affaddr{Cyberjaya, Malaysia}\\
  \email{liantze@gmail.com}
  \alignauthor Another Author\\
  \affaddr{Another University}\\
  \affaddr{Another City}\\
  \email{an.other@email.com}
}
```



ACM SIG Proceedings (cont'd)

Basic Example; Worksheet Exercise 7.1



```
\title{My First Paper}

\begin{document}

\maketitle

\begin{abstract}
This should be a succinct paragraph summarising your paper.
\end{abstract}
\category{I.7.2}{Document Preparation}{Photocomposition,
typesetting}
\terms{Documentation}
\keywords{\LaTeX, typesetting, learning by example}

%% Now your paper begins...
\section{Introduction}

...
```



ACM SIG Proceedings (cont'd)

Basic Example; Worksheet Exercise 7.1



```
%% ACM uses abbrev bibliography style  
\bibliographystyle{abbrev}  
\bibliography{bibliography-file}  
\end{document}
```



- Install the **IEEEtran package**; it's included in MikTeX
- Conference mode available (not demonstrated today)
- IEEE Computer Society Press conferences use **IEEEconf** package instead
- Figures and tables spanning 2 columns:

```
\begin{figure*}...\end{figure*}
```

```
\begin{table*}...\end{table*}
```
- The documentation contains complete instructions (use `mthelp` to access it)



```
\documentclass{IEEEtran}
\usepackage{graphicx}

\author{Lim Lian Tze and Another Author}
\thanks{This work was received January 20, 2010; revised
January 30, 2010.}
\thanks{Lim Lian Tze is with the Multimedia University. Another
Author is with Another University. See http://fit.mmu.edu.my/sig/nlp/ for contact details.}

\title{My First Paper}
\IEEEpubid{0000--0000/00\$\$00.00 \copyright 2007 IEEE}

\begin{document}
\maketitle

\begin{abstract}
```



IEEE Transactions (cont'd)

Basic Example; Worksheet Exercise 7.2



This should be a succinct paragraph summarising your paper.

```
\end{abstract}
```

```
\begin{IEEEkeywords}
```

```
\LaTeX, typesetting, learning by example.
```

```
\end{IEEEkeywords}
```

%% Now your paper begins...

```
\section{Introduction}
```

...

%% Use IEEEtran bibliography style

```
\bibliographystyle{IEEEtran}
```

```
\bibliography{bibliography-file}
```

%% Author biographies

```
\begin{IEEEbiography} [{\includegraphics [width=1in,height=1.25in  
]{llt-grayscale}}]
```



IEEE Transactions (cont'd)

Basic Example; Worksheet Exercise 7.2



```
{Lim Lian Tze} is currently a Ph.D.\ student at the Multimedia
University studying Natural Language Processing.
```

```
\end{IEEEbiography}
```

```
\begin{IEEEbiography}[{\includegraphics[width=1in,height=1.25in]
}{another-grayscale}]]
```

```
{Another Author} is Associate Professor at Another University
with a research interest in Natural Language Processing.
```






```
\end{IEEEbiography}
```

```
\end{document}
```



- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides**
- 10 Teasers



- Quite a few choices to creating presentation slides...
- ...but beamer is (one of the) most versatile
(the manual has 200+ pages; use as a reference)
- This presentation was created with beamer!
(Note the clickable hyperlinks and auto-generated section navigation)
- To run slideshow in Acrobat Reader:
 -  +  to go fullscreen
 - Spacebar or arrow keys ( ) to go to next/previous slide
 -  to exit slideshow



Simple beamer Example

Worksheet Exercise 8



```
\documentclass{beamer}

\author{Lian Tze}
\title{Quick Beamer Example}
\institute{NLP-SIG, MMU}
\date{8 March 2010}

\begin{document}

\begin{frame}
\maketitle
\end{frame}

\section{Introduction}
\subsection{Hello!}
```



Simple beamer Example (cont'd)

Worksheet Exercise 8



```
\begin{frame}
\frametitle{Hello World!}
```

This is my first presentation with `\LaTeX`.

```
\begin{itemize}
\item Beamer has many features
\item This is just a simple demo
\end{itemize}
\end{frame}
```

```
\subsection{Maths}
\begin{frame}
\frametitle{Maths work, too}
\begin{equation}
y = ax^2 + bx + c
\end{equation}
```



Simple beamer Example (cont'd)

Worksheet Exercise 8



```
\end{frame}

\section{Conclusion}

\begin{frame}
\frametitle{It's Your Decision}
\begin{itemize}
\item Give \LaTeX\ a try
\item You might hate it, you might love it
\item Now that you've tried it, you can decide if it's
for you
\end{itemize}
\end{frame}

\end{document}
```



Simple beamer Example (cont'd)

Worksheet Exercise 8



Quick Beamer Example

Lian Tze
NLP-SIG, MMU
8 March 2010

◀ ◯ ▶ ◂ ◃ ◅ ◆ ◇ ◈ ◉ ◊ ○ ◌ ◍ ◎ ● ◐ ◑ ◒ ◓ ◔ ◕ ◖ ◗ ◘ ◙ ◚ ◛ ◜ ◝ ◞ ◟ ◠ ◡ ◢ ◣ ◤ ◥ ◦ ◧ ◨ ◩ ◪ ◫ ◬ ◭ ◮ ◯ ◰ ◱ ◲ ◳ ◴ ◵ ◶ ◷ ◸ ◹ ◺ ◻ ◼ ◽ ◾ ◿ ◰ ◱ ◲ ◳ ◴ ◵ ◶ ◷ ◸ ◹ ◺ ◻ ◼ ◽ ◾ ◿

Hello World!

This is my first presentation with \LaTeX .

- ▶ Beamer has many features
- ▶ This is just a simple demo

◀ ◯ ▶ ◂ ◃ ◅ ◆ ◇ ◈ ◉ ◊ ○ ◌ ◍ ◎ ● ◐ ◑ ◒ ◓ ◔ ◕ ◖ ◗ ◘ ◙ ◚ ◛ ◜ ◝ ◞ ◟ ◠ ◡ ◢ ◣ ◤ ◥ ◦ ◧ ◨ ◩ ◪ ◫ ◬ ◭ ◮ ◯ ◰ ◱ ◲ ◳ ◴ ◵ ◶ ◷ ◸ ◹ ◺ ◻ ◼ ◽ ◾ ◿

Maths work, too

$$y = ax^2 + bx + c \quad (1)$$

◀ ◯ ▶ ◂ ◃ ◅ ◆ ◇ ◈ ◉ ◊ ○ ◌ ◍ ◎ ● ◐ ◑ ◒ ◓ ◔ ◕ ◖ ◗ ◘ ◙ ◚ ◛ ◜ ◝ ◞ ◟ ◠ ◡ ◢ ◣ ◤ ◥ ◦ ◧ ◨ ◩ ◪ ◫ ◬ ◭ ◮ ◯ ◰ ◱ ◲ ◳ ◴ ◵ ◶ ◷ ◸ ◹ ◺ ◻ ◼ ◽ ◾ ◿

It's Your Decision

- ▶ Give \LaTeX a try
- ▶ You might hate it, you might love it
- ▶ Now that you've tried it, you can decide if it's for you

◀ ◯ ▶ ◂ ◃ ◅ ◆ ◇ ◈ ◉ ◊ ○ ◌ ◍ ◎ ● ◐ ◑ ◒ ◓ ◔ ◕ ◖ ◗ ◘ ◙ ◚ ◛ ◜ ◝ ◞ ◟ ◠ ◡ ◢ ◣ ◤ ◥ ◦ ◧ ◨ ◩ ◪ ◫ ◬ ◭ ◮ ◯ ◰ ◱ ◲ ◳ ◴ ◵ ◶ ◷ ◸ ◹ ◺ ◻ ◼ ◽ ◾ ◿



Beamer Presentation Themes

See *Chapter 15: Themes* in beamer manual



■ Try these:

- `\usetheme{CambridgeUS}`
- `\usetheme{Singapore}`
- `\usetheme{Montpellier}`
- `\usetheme{Warsaw}`
- `\usetheme{Goettingen}`
- Colour schemes, e.g. `\usecolortheme{crane}`
- <http://www.hartwork.org/beamer-theme-matrix/>
- Other customisations, including defining your own themes
- Try googling for more themes; e.g.
<http://staff.science.uva.nl/~koppejan/misc/latex.html>



Beamer Presentation Themes (cont'd)

See *Chapter 15: Themes* in beamer manual



CambridgeUS



Singapore



Montpellier



Warsaw



Goettingen





- 1 What is this \LaTeX and Why would I need it?
- 2 Basics
- 3 Typesetting Text
- 4 Structuring and Cross-referencing Text
- 5 Typesetting Mathematics
- 6 Graphics, Figures and Tables
- 7 Citations and References
- 8 Preparing Manuscripts for Conferences and Journals
- 9 Presentation Slides
- 10 Teasers**

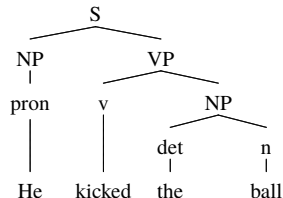


Teasers: Domain-specific Stuff

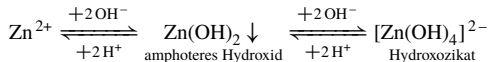


■ Linguistics

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



■ Chemistry

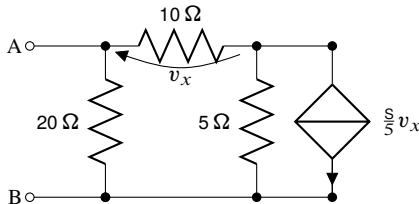




Teasers: Domain-specific Stuff (cont'd)



■ Electronics



■ Bar codes





Teasers: Domain-specific Stuff (cont'd)



Song books



C



G



Am



F

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



C



G



F

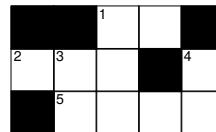
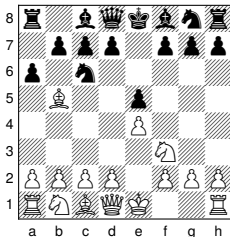


C

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

Games

1 e4 e5 2 f3 f3 c6 3 b5 a6



Across: 1 unit of measure 2 * 5 non-
nioning unit

Down: 1 η 3 unit
of measure 4 non-
proportional font



Useful Links



- [1] *MiKTeX Download Page*. URL: <http://miktex.org/2.8/setup>.
- [2] *MiKTeX FAQ*. URL: <http://docs.miktex.org/faq/faq.html>.
- [3] Tobias Oetiker et al. *The Not So Short Introduction to L^AT_EX 2_ε*. (Run `mthelp --view lshort` to access.) 2009.
- [4] *L^AT_EX Wikibook* 👍. URL: <http://en.wikibooks.org/wiki/LaTeX>.
- [5] *Getting to grips with L^AT_EX*. URL:
<http://www.andy-roberts.net/misc/latex/>.
- [6] *Malaysian L^AT_EX Users Group Blog*. (I'm one of the authors.) URL:
<http://latex-my.blogspot.com/>.
- [7] *L^AT_EX: Beautiful Typesetting*. (My own page on L^AT_EX; all the materials today can be downloaded here.) URL:
<http://liantze.googlepages.com/latextypesetting>.
- [8] *The T_EX Users Group web site*. URL: <http://www.tug.org/>.
- [9] *The Comprehensive TeX Archive Network*. URL: <http://mirror.ctan.org/>.



Thank you

谢谢

ありがとう

Gracias

Danke

Grazie

Terima kasih

شكرا لك

Merci

Cảm ơn bạn

감사합니다

Obrigado