

LaTeX briefing

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Dept. of Mathematical Sciences, 16 October 2013

\TeX :

- High quality typesetting especially also for *maths*.
- Stable (last major update in 1989).
- Reliable (used to typeset books with 1000+ pages).
- Free and open source.

T_EX:

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Donald Knuth



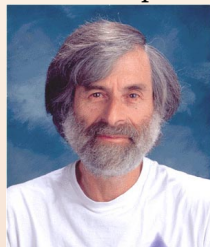
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Leslie Lamport



\LaTeX (or $\text{\LaTeX}_{2\epsilon}$):

- Large set of add-on packages.
- Emphasis on document structure.
- Now includes packages for many typesetting needs including AMSmath for advanced maths typesetting.

- **NOT:** “What You See Is What You Get”,
- **BUT:** “You Asked For It, You Got It”.
- It takes a bit longer to get the hang of it (compared to e.g. Word).
- But it is far more powerful and reliable once you master it.
- \TeX is like a “compiler” for “typesetting programs”,
transforming a text input file to a PDF output file.

- Your document is an ordinary ASCII file:

```
demo.tex
\documentclass{report}

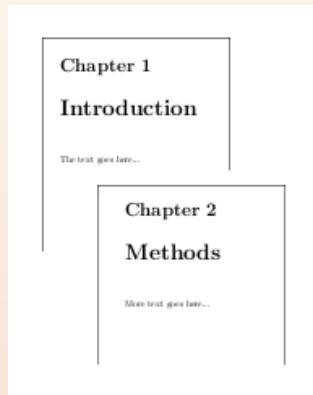
\begin{document}
\chapter{Introduction}
The text goes here...
\chapter{Methods}
More text goes here...
\end{document}
```

- Emphasis on structure, not presentation.
- Can cut and paste bits.

- Run the pdflatex ‘compiler’ on this file:

```
pdflatex demo.tex
```

- This produces a PDF file ‘demo.pdf’.
- Graphical front-ends exist for all platforms.



- Use a simple language for special symbols and mathematical structure.

mathdemo.tex

Simple formulas inline $\int_{\alpha}^{\beta} \sin^2 x$
and in

```
\begin{equation}
```

```
\int_{\alpha}^{\beta} F = \frac{Q}{R}
```

```
\end{equation}
```

displayed form with equation numbers.

mathdemo.pdf

Simple formulas inline $\int_{\alpha}^{\beta} \sin^2 x$ and in

$$\int_{\alpha}^{\beta} F = \frac{Q}{R} \quad (1)$$

displayed form with equation numbers.

- Give elements of your document a label and then refer to them by name:

refdemo.tex

Our main result is

```
\begin{equation}
```

```
\label{main_result}
```

$A=B$

```
\end{equation}
```

If we now insert `\eqref{main_result}` into ...

refdemo.pdf

Our main result is

$$A = B \tag{2}$$

If we now insert (2) into ...

- All sorts of tables and tabular data:

tabledemo.tex

```
\begin{tabular}{llc}  
fruit & day & number \\  
\hline  
apple & monday & five \\  
pear & tuesday & eight  
\end{tabular}
```

tabledemo.pdf

fruit	day	number
apple	monday	five
pear	tuesday	eight

- Extra packages are included through:

packagedemo.tex

```
\usepackage{amsmath}  
\begin{equation}  
\begin{aligned}  
\sin(x) &= a(x) + b(x) \\  
\cos(x) + 3 &= a(x) - b(x)  
\end{aligned}  
\end{equation}
```

packagedemo.pdf

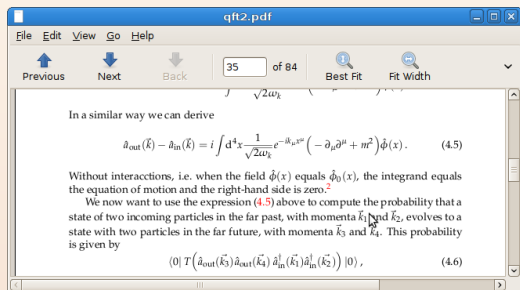
$$\begin{aligned}\sin(x) &= a(x) + b(x) \\ \cos(x) + 3 &= a(x) - b(x)\end{aligned}\tag{3}$$

```

\end{aligned}
\end{equation}
In a similar way we can derive
\begin{equation}
\label{e:ainoutrelation}
\hat{a}_{-}(\text{out})\hat{\vec{k}} - \hat{a}_{-}(\text{in})\hat{\vec{k}} =
i \int d^4x \frac{1}{\sqrt{2\omega_k}} e^{-ik_{\mu}x^{\mu}} \Big(
-\partial_{\mu}\hat{\phi}(x) + m^2\hat{\phi}(x)
\Big)
\end{equation}
Without interactions, i.e., when the field $\hat{\phi}(x)$
equals $\hat{\phi}_0(x)$, the integrand equals the equation of motion
and the right-hand side is zero. \footnote{In deriving this formula we
are cheating a bit with boundary terms when doing partial
integrations. As usual, these arguments can be made more precise by
properly smearing operators with wave packets (see
e.g., \cite{Srednicki:2007qq}) and the result is that we can indeed
just ignore the boundary terms.}

If now want to use the expression \eqref{e:ainoutrelation} above to
compute the probability that a state of two incoming particles in the
far past, with momenta $\vec{k}_1$ and $\vec{k}_2$, evolves to a state
with two particles in the far future, with momenta $\vec{k}_3$ and
$\vec{k}_4$. This probability is given by
\begin{equation}

```



- BibTeX: automatically sorted and formatted bibliographies.
- mkindex: for index and glossary.
- colour package
- poster package
- beamer package (for presentations like this)

- all freely available !

already included in your installation,
or downloadable from the Comprehensive TeX Archive Network
www.ctan.org/

- All sorts of graphics effects



transparency





- All distributions (Ubuntu, Fedora, SUSE, Debian, ...) have \LaTeX ready to run, and have most add-on packages.
- Graphical front-ends:
 - Emacs with AUCTeX
 - Kile (KDE): <http://kile.sourceforge.net/>
 - TeXworks: <http://tug.org/texworks/>
 - Texmaker: <http://www.xmlmath.net/texmaker/>
 - TeXmacs: <http://www.texmacs.org/>
 - Gummi: <http://dev.midnightcoding.org/projects/gummi>
 - LyX: <http://www.lyx.org/>



- Various options, a recommended one is MacTeX:
<http://www.tug.org/mactex/>
- This includes various graphical front-ends,
 - the most often used is TeXShop <http://pages.uoregon.edu/koch/texshop/>
 - TeXworks: <http://tug.org/texworks/>
- Apps for Latex for iPad start to appear. This may not be suitable for substantial writing, but might be convenient on some occasions. See e.g. <http://www.texpadapp.com>



- Best off with MiKTeX: <http://miktex.org/>
- Graphical front-ends:
 - TeXnicCenter: <http://www.texniccenter.org/>
 - Winshell: <http://www.winshell.org/>
 - TeXworks: <http://tug.org/texworks/>
 - LyX: <http://www.lyx.org/>

- Maths project web pages

maths.dur.ac.uk/Ug/projects

- Computing and Information Services - Introduction to Latex (4 November - IT79)

www.dur.ac.uk/training.course/its/

- Search online

e.g. for 'Latex reference card'

- Email:

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