

# The Joys of $\text{\LaTeX}$

A  $\leq 60$  minute lecture, with examples, introducing the world's standard typesetting language.

Vadim Ponomarenko

Department of Mathematics and Statistics  
San Diego State University

June 24, 2008

<http://www-rohan.sdsu.edu/~vadim/latex60.pdf>

<http://www-rohan.sdsu.edu/~vadim/latex60.tex>



# What is $\text{\LaTeX}$ ?

$\text{\LaTeX}$  is not:

- Word processor
- Editor
- Computer program

$\text{\LaTeX}$  is:

- Language in which documents are specified in a logical (not physical) manner



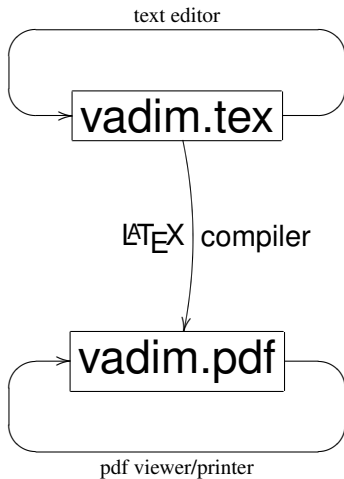
# Benefits

- Professional-looking output
- Easy to do challenging things like math formulas, footnotes, references, tables of contents, indices, bibliographies, etc.
- Device and platform independent
- Text-based
- Encourages good organization
- Free

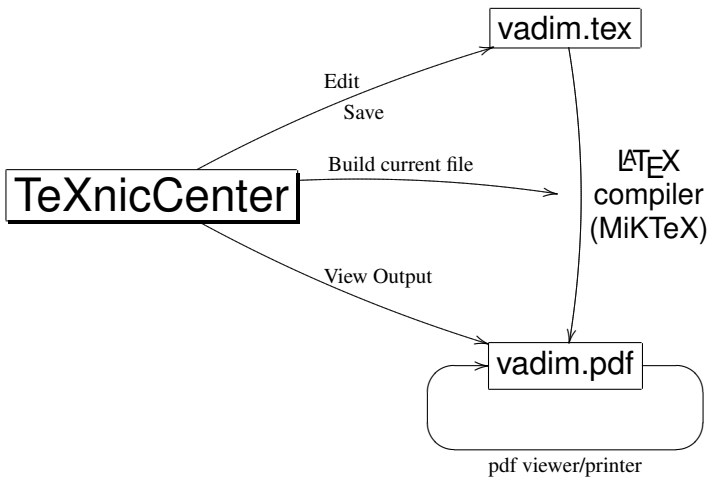




# Simplified Usage



# Less Simplified Usage



# TeXnicCenter

The screenshot shows the TeXnicCenter interface for a file named "Latex 30mins.tex". The menu bar includes File, Edit, Search, View, Insert, Math, Format, Project, Build, Tools, Window, and Help. The toolbar contains various icons, with a green circle highlighting the "LaTeX => PDF" button and a green arrow pointing to it. The main text area contains LaTeX source code:

```
254
255\begin{frame}{Other Resources}
256\begin{itemize}
257\item[]\underline{The Not So Short Introduction to \LaTeX $2_\epsilon$},
258Oetiker et al,\
259\texttt{http://tobi.oetiker.ch/lshort/lshort.pdf}
260\item[]
261\item[] Online tutorial: \texttt{http://www.tug.org/tutorials/tugindia/}
262\item[]
263\item[] MiKTeX: \texttt{http://www.miktex.org}
264\item[]
265\item[] TeXnic Center: \texttt{http://www.toolscenter.org/}
266\end{itemize}
```

Below the source code is a terminal window showing the following error messages:

```
I found no \bibstyle command---while reading file D:\Inactive\Talks\Latex 30mins.aux
(There were 3 error messages)
Couldn't find input index file D:\Inactive\Talks\Latex 30mins nor D:\Inactive\Talks\Latex
Usage: C:\Program Files\MiKTeX 2.5\miktex\bin\makeindex.exe [-ilqrcgLT] [-s sty] [-o ind]

LaTeX-Result: 1 Error(s), 0 Warning(s), 11 Bad Box(es), 12 Page(s)
```

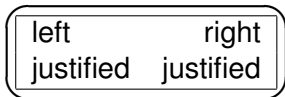
The status bar at the bottom indicates "Ln 257, Col 5" and "UNIX" mode. The bottom-most status bar says "Press F1 to get help".





## Example 2

```
\usepackage{fancybox}
\begin{document}
\Ovalbox{
  \begin{tabular}{|lr|}
  \hline left & right \\
  justified & justified \\
  \hline \end{tabular}
}
\end{document}
not compiled
```



## Example 3

Important equations can get a number and their own line:

```
\begin{equation} 3^{2^x} \geq \mu \end{equation}
 $x_1 > x_2 > \cdots, x_i \in \mathbb{R},$ 
 $\sqrt{\sqrt[3]{x}}, \dots$ 
```

---

Important equations can get their a number and own line:

$$3^{2^x} \geq \mu \tag{1}$$

$$x_1 > x_2 > \cdots, x_i \in \mathbb{R}, \sqrt{\sqrt[3]{x}}, \dots$$



## Example 4

```
\newtheorem{vthm}{Theorem}
\begin{vthm}good theorem\label{good}\end{vthm}
\begin{proof}blah, blah\end{proof}    (amsthm)
\begin{vthm}great theorem\label{great}\end{vthm}
We now generalize Theorem \ref{good}
and Theorem \ref{great}.
```

---

**Theorem 1.** *good theorem*

**Proof.**

blah, blah



**Theorem 2.** *great theorem*

We now generalize Theorem 1 and Theorem 2.



## Example 5

```

 $\sum_{i=1}^7 3i$  \hspace{1in}
 $\underset{i=1}{\overset{7}{\sum}} 3i$  \hspace{1in}
 $\underset{x \rightarrow \infty}{\lim} x^2$  \\
\vspace{3.6mm}

```

$$\sum_{i=1}^7 3i$$

$$\sum_{i=1}^7 3i$$

$$\lim_{x \rightarrow \infty} x^2$$

Use ‘ and ’; avoid the sweet temptation of "

Other units: in, cm, pt, weird ones like bp<sub>(=1.00375pt)</sub>,  
`\textwidth`, `\pagewidth`





# Basics

- Always load:  
`amsmath, amsthm, amssymb, amsfonts`
- Often useful: `fullpage`
- All packages at: <http://www.ctan.org>



# Basics

- Always load:  
`amsmath, amsthm, amssymb, amsfonts`
- Often useful: `fullpage`
- All packages at: <http://www.ctan.org>





## Including Graphics

- Use package `graphicx` (not needed with Beamer), and LaTeX => PDF.

- For raster images (png, jpg, gif) and pdf, use:

```
\includegraphics[width=2in]{vadims_image}
```

No extension needed, the wrong file is picked automatically

- For vector images, convert eps to pdf using `epstopdf`.
- If it didn't work, or is misaligned, prepare to waste an afternoon. Try: `minipage`, `raisebox`, `figure`







## Including Graphics

- Use package `graphicx` (not needed with Beamer), and LaTeX => PDF.

- For raster images (png, jpg, gif) and pdf, use:

```
\includegraphics[width=2in]{vadims_image}
```

No extension needed, the wrong file is picked automatically

- For vector images, convert eps to pdf using `epstopdf`.
- If it didn't work, or is misaligned, prepare to waste an afternoon. Try: `minipage`, `raisebox`, `figure`



# Beamer

- Packages `latex-beamer`, `pgf`, `xcolor` must be installed.
- Pick a theme, e.g. `Singapore`
- Most  $\text{\LaTeX}$  commands unchanged, some new ones (e.g. `\pause`)  
Find other people's code and steal it.
- Manual available at:  
<http://www.ctan.org/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf>



# Beamer

- Packages `latex-beamer`, `pgf`, `xcolor` must be installed.
- Pick a theme, e.g. Singapore
- Most  $\text{\LaTeX}$  commands unchanged, some new ones (e.g. `\pause`)  
Find other people's code and steal it.
- Manual available at:  
<http://www.ctan.org/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf>



# Beamer

- Packages `latex-beamer`, `pgf`, `xcolor` must be installed.
- Pick a theme, e.g. Singapore
- Most  $\text{\LaTeX}$  commands unchanged, some new ones (e.g. `\pause`)  
Find other people's code and steal it.

- Manual available at:

<http://www.ctan.org/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf>



# Beamer

- Packages `latex-beamer`, `pgf`, `xcolor` must be installed.
- Pick a theme, e.g. Singapore
- Most  $\text{\LaTeX}$  commands unchanged, some new ones (e.g. `\pause`)  
Find other people's code and steal it.

- Manual available at:

<http://www.ctan.org/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf>



# BibTeX

```
\cite{lampport}
\bibliography{vadim} \bibliographystyle{plain}
```

---

```
@BOOK{lampport,
  author = "Leslie Lamport",
  title = "{\LaTeX:} {A} Document ...",
  publisher = "Addison-Wesley",
  year = 1986 }
```

---

<http://www.ams.org/mathscinet/search>



## Other Resources

The Not So Short Introduction to L<sup>A</sup>T<sub>E</sub>X2<sub>ε</sub>, Oetiker et al,  
<http://tobi.oetiker.ch/lshort/lshort.pdf>

Online tutorial

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

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

TeXNic Center <http://www.toolscenter.org/>

Mac users:

[http://www.cs.wright.edu/~jslater/mac-tex/  
mac-tex-intro/mactexintro.html](http://www.cs.wright.edu/~jslater/mac-tex/mac-tex-intro/mactexintro.html)

