

L^AT_EX Quick Start

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1 What is L^AT_EX ?

L^AT_EX is a typesetting system. Simply, we as authors write the text and L^AT_EX places it on the page. L^AT_EX is a macro package and acts as a frontend to T_EX. Donald Knuth created T_EX in 1982 as a remedy for the poor quality of publishing in the mathematical sciences. Leslie Lamport wrote L^AT_EX to make T_EX easier to use, and thus created the most popular way of using T_EX.

2 Why use L^AT_EX ?

There are many excellent documents written on this topic and I am just paraphrasing from them.

- Produces the best output.
- Standard for typesetting scientific documents.
- Easy to use with mathematical symbols.
- Meaning based structuring (Automatic).
- Its FREE!

An excellent set of reasons for using L^AT_EX can be found at http://www.ctan.org/what_is_tex.html.

3 Installation

L^AT_EX is highly popular and its users actively participate in enhancing L^AT_EX. As a result hundreds of related packages are available. The downside is that a new user often finds it confusing to choose packages to install. To get you started quickly I have put together the list below for different platforms that will work best for new users.

- Windows
 - *proT_EX* → L^AT_EX processor
 - *TeXnicCenter* → editor
- Unix/Linux
 - T_EX Live or teT_EX → L^AT_EX processor
 - *Emacs* (or T_EXMaker) → editor
- Mac
 - MacT_EX → L^AT_EX processor
 - *LyX* → editor

Note that in selecting the above packages, emphasis was on ease of installation. As you become proficient in L^AT_EX, you will want to use more sophisticated packages not mentioned above. However, this guide is intended for beginners and the above list is more than enough to start producing great professional looking documents. You will find a complete list of packages related to T_EX at the CTAN website <http://www.ctan.org/>.

I have downloaded the above packages and burnt them on CDs. You are welcome to borrow them for installing on your computer.

4 Getting Started

“*The Not So Short Introduction to L^AT_EX 2_ε*” is an excellent guide for beginners. I urge you to read it as a supplement to this guide. Let us start with a minimal L^AT_EX document.

```
\documentclass{article} → A minimal LATEX document.
\begin{document}
A minimal \LaTeX\ document.
\end{document}
```

Some general pointers:

- Commands start with a “\” (backslash)
- Documents start with `\documentclass{. . .}`
 - Specifies the type of document. *article*, *report*, *book* and *letter* are the basic documentclasses included with L^AT_EX. Most institutions have their own class definitions. For example, a student submitting a thesis to Purdue University will use this command : `\documentclass{pthesis}`

5 Environments

The region enclosed by `\begin{name} ... \end{name}` is called an environment. Some common environments are: *equation*, *figure*, *table* etc. Text within environments are typeset differently depending on the environment’s specifications.

5.1 Typesetting Mathematics

<code>\alpha</code>	α	<code>x^y</code>	x^y	<code>\pm</code>	\pm
<code>\psi</code>	ψ	<code>x_y</code>	x_y	<code>\times</code>	\times
<code>\omega</code>	ω	<code>x_y^z</code>	x_y^z	<code>\approx</code>	\approx

5.1.1 Calculus Examples

```
\int_0^{\infty} → ∫0∞      \int{\int} → ∫ ∫
\frac{\partial u}{\partial x} → ∂u/∂x
```

An exhaustive reference for math can be found at : www.ams.org/tex/short-math-guide.html.

5.2 Figures & Tables

Figures and tables do not look nice if broken between pages. To solve the problem L^AT_EX treats them as “floating” environments. By “floating” we mean that the figure/table will be placed in an appropriate position, i.e., not exactly at the specified location but at a location that is aesthetically pleasing and closest to the specified location. Often, figures and tables are placed inside their respective environments. For instance,

```
\begin{figure}
\includegraphics{graph}
\end{figure}
```

- A thorough discussion of dealing with figures can be found at www.ctan.org/tex-archive/info/epslatex.pdf
- www.grad.iit.edu/latex/LaTeX/TableHelp1.pdf has a nice list of tricks to produce good tables.

6 Output Formats

A L^AT_EX source file can be used to produce a variety of output formats like *.dvi*, *.ps*, *.pdf*, *.rtf*, *.html*, *.xml*.

7 Further Reading

1. “*L^AT_EX : A Document Preparation System*” by Leslie Lamport from the creator of L^AT_EX
2. “*The Not So Short Introduction to L^AT_EX 2_ε*” by T. Oetiker : www.ctan.org/tex-archive/info/lshort/english/lshort.pdf
3. <http://tex.loria.fr/english/general.html> has an exhaustive list of L^AT_EX references.