

Intro to L^AT_EX in one page

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- L^AT_EX is a computer language, and the name of the program that converts that language to printed (or printable) output.

To use L^AT_EX you first create an input file, which looks like a file of computer code: it is formatted as simple, plain text, i.e. with no fonts, pictures, margins, etc. The input file contains ordinary words and commands that will be interpreted by the program to produce the output. You create this file in a text editor like Emacs, or Notepad, or a front end like TeXShop, TeXMaker, or writeLaTeX (which each offer a built-in text editor).

Then you run the program L^AT_EX, which takes your input file and produces output, typically a PDF file (for Adobe Reader).

- Here's a minimal L^AT_EX file: everything here (except for "hello world") needs to be in every file you make

Example 1. Input:

```
\documentclass{article}
\begin{document}
Hello world.
\end{document}
```

Output:

Hello world.

- Spaces and paragraphs. This example shows how spaces in the input don't necessarily create spaces in the output: paragraphs

Example 2. Input:

```
Words
automatically
wrap
to fill the left and right edges.
It doesn't matter where you put
your spaces or if you hit
return once
followed by more text.
```

Hitting return twice, leaving a blank line, starts a new paragraph.

Output:

Words automatically wrap to fill the left and right edges. It doesn't matter where you put your spaces or if you hit return once followed by more text.

Hitting return twice, leaving a blank line, starts a new paragraph.

- All math formulas should be typed inside math mode, which you turn on and off by typing certain characters in your input. The simplest way to turn math on and off is to type \$. Try the following simple example.

Example 3. Input:

```
\documentclass{article}
\begin{document}
```

```
The sum $3+7$ equals $10$. Note that $0
\times x=0$ for all $x$. If we get a
common denominator then we can see that $
\frac{12}{5} + \frac{35}{6} = \frac{12}{5} + \frac{35}{6}$.
\end{document}
```

Output:

The sum $3 + 7$ equals 10 . Note that $0 \times x = 0$ for all x . If we get a common denominator then we can see that $\frac{12}{5} + \frac{35}{6} = \frac{12}{5} + \frac{35}{6}$.

- Of course, L^AT_EX is more fun with more complicated examples. Try entering the following to see how it works.

Example 4. Input:

```
\documentclass{article}
\begin{document}
The solution of $ax^2+bx+c=0$ is given by
$$
x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}.
$$
But the solution of
$$
a \int e^{-x^2} dx + b \sum \frac{1}{x^2} + c \sqrt{x} = 0.
$$
is unknown.
\end{document}
```

Output:

The solution of $ax^2 + bx + c = 0$ is given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

But the solution of

$$a \int e^{-x^2} dx + b \sum \frac{1}{x^2} + c \sqrt{x} = 0.$$

is unknown.

- As shown in the previous two examples, you should almost never have any regular text inside of math mode. To mix math and text you should almost always alternate, turning math mode on and then off.
- Other things you may want to learn about:
 - Controlling fonts.
 - What punctuation symbols do.
 - Page formatting.
 - Writing math.
 - Lots of symbols.
 - Tables and equations.
 - Lists
 - Cross referencing.
 - Defining new commands.