

A Guide to L^AT_EX

Welcome to Latex. This is how normal text is displayed. You can keep on typing off the screen like this but LaTeX is nice and smart and will just wrap everything for you. Of course, you can be kind to yourself and just use a linebreak (hit return/enter) to keep all of your lines within some reasonable width in the .tex file. Notice how LaTeX automatically ignores all of your line breaks in the .pdf. Neat! But now you wonder, how DO we add line breaks then???

This is how! Two line breaks is interpreted by LaTeX as a separator between two different paragraphs. And, because of some settings we included up there, there is a nice space between the two paragraphs too. Neato! Speaking of LaTeX...

L^AT_EX! This is the first command you've seen that displays something neat! Notice the command is prefixed by a backslash, much like a lot of things that you've seen so far in this file. The backslash is a really special character in L^AT_EX, so much so that you even need a special command in order to display it! \

Let's try to do some other things with just plaintext. You can **bold** text, *italicize* text, and underline text. You can also make text big, bigger, even bigger, and even H H H U U G E E E.

L^AT_EX also has a pretty unique way of generating the quote characters. "This is how a quote should look in LaTeX".

You can also get bulleted and numbered lists, which are great for formatting questions and answers.

- This is a bulleted list!
- With a bunch of things in it.
 - You can even nest these lists
 - In case there is serious categorization that you need to do.

And...

1. This is a numbered list!
2. Pretty cool, huh.
 - (a) Of course, nestable as well.

And...

1. You can also mix and
 - match!

And...

1. You can specify the format of the numbering like so:
 - Problem 1. Some Text
 - Problem 2. Next Problem
 - Problem 3. More Stuff
2. You can even specify where it all begins!

(e) Stuff

ix. Notice how we have “enumiii” instead of “enumii” here. The number of i’s is indicative of the level of the nesting that it controls.

At this point you might be thinking what on earth the point of all of this is, since nothing we’ve done so far is hard to achieve using Word or a similar word processing software. Well, it turns out L^AT_EX is amazing at displaying and working with mathematical symbols and equation.

For example: $(\frac{1}{2} + \frac{1}{2}) \times 34 = 1 \times 34 = 34$ or $(A \cap B) \cup (B \cap C) \subseteq D$.

There are some quirks to it of course. For example, i_2 looks all fine and dandy but notice what happens when we try this i_{this} – doesn’t look nearly like what we wanted it to. That’s because “operators” such as $_$ and $^$ operate on the thing that is directly on their right.

So, in order for it to work on a bunch of characters, we have to group them together using curly braces $\{ \}$. For example, i_{234} or i^{234} .

Let’s explore some more: $thisissomemoremathstuf fi^2 \times \frac{4}{5}$.

Hmm, that looks nothing like what we wanted. In fact, normal text behaves really poorly inside “math mode”. Since L^AT_EX wants to interpret all of the things in as “mathy” as way as possible, all of the text generally gets converted to look like how you would want variables to look. So $e = mc^2$ look real good, but *somethinglikethisdoesnot*.

What can we do? One of two things:

1. The first is that we can just move all of the normal text out of math mode where possible. This means changing things from $thisx^2 + x + 1$, to this $x^2 + x + 1$.
2. The second is that we can explicit tell L^AT_EX that it’s normal text and it should handle it like it is. For example $\{x|x \text{ is a cool variable}\}$

- While we’re at it, notice how the two x ’s are spaced pretty poorly? We can fix that by adding a \sim next to the pipe, like so: $\{x \mid x \text{ is a cool variable}\}$

So far, all of the expressions we’ve seen have been inline. But you can also make the expressions live in their own line by using L^AT_EX’s display mode, like so:

$$\sum_{i=0}^n i^3 + i = \prod_{j=1}^m j^2$$

And what if you want to display a series of equations?

$$\begin{aligned}(x+1)(x+2)(x+3) &= (x^2+3x+2)(x+3) \\ &= x^3+6x^2+11x+6 \\ &= 6+11x+6x^2+x^3\end{aligned}$$

This is a good place to stop this introductory guide to L^AT_EX, but it’s probably good for us to let you know that there is **so much** more to L^AT_EX than what we have covered in this guide. Once you’re done with this

guide, you'll definitely take a look at the "Useful L^AT_EX commands" document on the course site for all of different commands that you'll need for this course.

Beyond that, there are many great resources online where you can learn even more L^AT_EX and become a true power user (if you want).

L^AT_EX is something that you'll find that you'll need to use quite a few times in your college career, so it's best if you get a solid foundation starting in CIS160!

If you ever get stuck on something L^AT_EX related, feel free to post in the Piazza group with your struggle. Please take the time to run a quick Google search first though – more often than not that's what we as TAs do when a student has a L^AT_EX question anyways!