

# Setting Up L<sup>A</sup>T<sub>E</sub>X<sup>1</sup>

## Why L<sup>A</sup>T<sub>E</sub>X?

Using L<sup>A</sup>T<sub>E</sub>X for homework submissions CS109 is recommended<sup>2</sup>, but not required. So it is natural for you, the curious CS109 student, to ask, “Why should I use L<sup>A</sup>T<sub>E</sub>X?” L<sup>A</sup>T<sub>E</sub>X is the de facto standard scientific publications, so just as naturally, there are several reasons to use L<sup>A</sup>T<sub>E</sub>X outside of our recommendation.

1. L<sup>A</sup>T<sub>E</sub>X is based upon T<sub>E</sub>X by Donald Knuth<sup>3</sup>, who was recently referred to as “The Yoda of Computer Science” by the New York Times, so you are in good company when you use L<sup>A</sup>T<sub>E</sub>X.
2. L<sup>A</sup>T<sub>E</sub>X was created to create high-quality documents with minimal effort; L<sup>A</sup>T<sub>E</sub>X turns your humble homeworks into art. The idea behind L<sup>A</sup>T<sub>E</sub>X is to separate writing and formatting documents. As a result, you can write your homework in your favorite text editor, and L<sup>A</sup>T<sub>E</sub>X will automatically format your document.
3. Unlike CS109, L<sup>A</sup>T<sub>E</sub>X is often a requirement for publications, and occasionally, for other classes at Stanford, so now is as good as a time to learn L<sup>A</sup>T<sub>E</sub>X as any. This is especially true when you need to write mathematical equations online, e.g. for a post on Piazza, which has built-in L<sup>A</sup>T<sub>E</sub>X support. Currently, there is no better way to typeset equations.
4. It is also easier to write L<sup>A</sup>T<sub>E</sub>X in bed, as opposed to writing in bed with a pencil and papers. You may find this helpful hint to be especially relevant given the fact that classes will be online.

Hopefully, you can now see the benefits of L<sup>A</sup>T<sub>E</sub>X in your day-to-day life as a student. We will now cover the basics of using L<sup>A</sup>T<sub>E</sub>X.

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<sup>1</sup>Updated in April 2020 by Benson Kung from an introduction written by Juan Batiz-Benet.

<sup>2</sup>**Please, please, please** consider using L<sup>A</sup>T<sub>E</sub>X.

<sup>3</sup>Donald Knuth is also a professor at our university, and has received, amongst other accolades, the Turing Award, the National Medal of Science, the John von Neumann Medal, and the Kyoto Prize.

# Installing L<sup>A</sup>T<sub>E</sub>X

## The Overleaf Option

You can actually avoid installing L<sup>A</sup>T<sub>E</sub>X by using [Overleaf](#), to which you actually have [free Pro access](#) provided by the university. Overleaf offers many perks, including automatic side-by-side rendering of your document, so it is a good option for people that are new to L<sup>A</sup>T<sub>E</sub>X.

## For iOS

To download everything you need, you need to download [MacTeX](#). For the purpose of CS109, it is sufficient to download BasicTeX. To use L<sup>A</sup>T<sub>E</sub>X, you need to:

1. Write what you need to in some `file.tex` using your favorite editor<sup>4</sup>.
2. Use Terminal and `cd` to the appropriate directory. Then compile your document using the command `pdflatex file.tex`.
3. If your file compiles successfully, you will now have a `file.pdf`! Wonderful, just wonderful. You can view `file.pdf` using Preview. Web browsers like Google Chrome or Mozilla Firefox also provide PDF support if you find Preview to be slow.

In general, just as you would for a program, you will probably want to compile your L<sup>A</sup>T<sub>E</sub>X document early and often. This will make it easier to catch mistakes.

## For Windows<sup>5</sup>

To download everything you need, you need to download [MiKTeX](#)<sup>6</sup>. To use L<sup>A</sup>T<sub>E</sub>X, you need to:

1. Write what you need to in some `file.tex` using your favorite editor<sup>7</sup>.
2. Use PowerShell and `cd` to the appropriate directory. Then compile your document using the command `texify file.tex`.
3. If your file compiles successfully, you will now have a `file.pdf`! Wonderful, just wonderful. You can view `file.pdf` using your favorite PDF viewers. Web browsers like Google Chrome or Mozilla Firefox also provide PDF support if you find Preview to be slow.

In general, just as you would for a program, you will probably want to compile your L<sup>A</sup>T<sub>E</sub>X document early and often. This will make it easier to catch mistakes<sup>8</sup>.

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<sup>4</sup>For students that have taken CS107, you could even use Vim or Emacs. I do not endorse either editor for L<sup>A</sup>T<sub>E</sub>X purposes.

<sup>5</sup>Care was taken to write this section. However, historically, I have found that Windows can be challenging to configure. As a result, feel free to e-mail me at [benson97](mailto:benson97) if you have found alternative ways to use L<sup>A</sup>T<sub>E</sub>X on Windows, especially if Texmaker and MiKTeX did not work for you.

<sup>6</sup>Other CAs have also found using [Texmaker](#) to be a solid option as well.

<sup>7</sup>Many TeX distributions also come with a text editor. I find these to be clunky, but you can feel free to experiment with them.

<sup>8</sup>Yes, I also wrote this in the iOS section. But I think it's good advice, so I do not think it hurts to repeat it!

## Linux

For Debian or Ubuntu, you can download a L<sup>A</sup>T<sub>E</sub>X distribution using:

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sudo apt-get install texlive
```

Using L<sup>A</sup>T<sub>E</sub>X for Linux is much the same as using L<sup>A</sup>T<sub>E</sub>X for iOS. See the iOS section for specifics.

## Resources

Overleaf has already written [an excellent guide](#) on  $\text{\LaTeX}$ , which you can follow even if you prefer to develop locally. (Your distribution should have every package that you need.) However, if you would like a person to talk through writing a  $\text{\LaTeX}$  document with you, there is a video on [YouTube](#). There is also an accompanying sample  $\text{\LaTeX}$  document which can be found on the [CS109 website](#), that you can adapt for your own needs. Finally, there are many useful commands you can use, which have been recorded on [a helpful cheat sheet](#).