

# GETTING STARTED WITH L<sup>A</sup>T<sub>E</sub>X AND VIM

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I wrote this document to archive the process of setting up my workflow for taking notes and writing papers in case I needed to reference it for some reason in the future. I figured there's no reason not to share it, in case someone might find it useful. This is by no means exhaustive, and is meant as a jumping-off-point. The actual documentation of the various software/packages should be the reader's next stop. The `.tex` file for this document is available at [this repository](#).

If you just want my style files, these can found at [this repository](#), and if you just want my vimrc, this can be found at [this repository](#).

This guide is written primarily for a mac, though most of what is written here would work fine for any Unix machine.

## 1. INTRODUCTION

L<sup>A</sup>T<sub>E</sub>X is a very simple typesetting tool which creates, in my opinion, very visually appealing documents. Much of the generic appeal of L<sup>A</sup>T<sub>E</sub>X is that a `.tex` document comes in the form of a plaintext document which is somehow modular. One sense in which this is true is that it can be compiled using any 'document class'. This means

that if you decide to write a paper hoping to submit it to one journal which wants the paper to look one way, and later decide to submit the paper to another journal which wants it to look another way, the structure of the actual pdf document can be changed immediately. This is just one example of the many things which make  $\text{\LaTeX}$  so great. For more information and a much better technical introduction to how this thing actually works, I suggest the *The TeXbook*, by D.E. Knuth.

Vim is a text editor which uses keystrokes (rather than menus and the cursor) to navigate and edit text documents. In other words you use combinations of keys on your keyboard to toggle through lines, copy, paste, find, etc. It can be used from a command line interface or as a standalone applications in a graphical user interface. So you can edit documents using Vim directly in the terminal or by opening the Vim application as you would open Microsoft Word. The fact that it uses keystrokes makes it hard to learn, but much faster once you do. It is also highly customizable with what it called a vimrc. We will learn about this in [section 3.2](#).

## 2. SETTING UP $\text{\LaTeX}$

2.1. **Installation.** Download from, and follow instructions from [this webpage](#).

2.2. **Macros.**  $\text{\LaTeX}$  macros should be thought of as custom ‘settings’. A basic example of such a thing is the following:

```
\newcommand{\RR}{\mathbb{R}}
```

which says that whenever one types `\RR` it is interpreted as `\mathbb{R}`. All such rules are collected in what is called a style file (a file with ending `.sty`) which lives in the directory

```
~/Library/texmf/tex/latex/
```

or the directory of whatever file you are editing. This is also where class files live. See [this repository](#) for mine.

## 3. SETTING UP VIM

3.1. **Installation.** Vim should come with your machine, but to make sure you have the latest version, or to install it for the first time, it is easiest to use homebrew. I.e. open your terminal and run the following command:

```
brew install vim
```

3.2. **Writing a vimrc.** The content of a vimrc file should be thought of as custom settings for Vim. When starting out it is tempting to copy and past someone else’s. If you would like to do this, mine can be found at [this repository](#). I would however suggest building up your own gradually, adding things as you need them. Google is helpful for this. By default your vimrc just lives in `/User/` but I prefer to have it in `~/.`vim so it is easier to push to my backup [repository](#).

3.3. **Packages for Vim.** There are countless packages available for Vim. I mention the main ones I use. Consult the documentation directly for more information.

- (1) Pathogen: In short, this package creates a directory such that whenever a package is placed in it, the package is loaded. There are many alternatives to this.

- (2) Nerd commenter: This package lets one comment lines quickly. It detects the document type so one doesn't have to keep track of which symbols comment lines in which document type, and instead one can have a designated keystroke combination which comments lines in any language.
- (3) Spell: Offers spell checking, and spell correction.
- (4) Ulti-Snips: Snippets are far too complicated to get into in depth, but they basically allow you to type an abbreviation for something, hit a special key (by default <tab>) and this abbreviation will expand to the larger predesignated thing. As one can imagine, this is extremely useful for typing things quickly. Especially in L<sup>A</sup>T<sub>E</sub>X. To write and customize snippets:  

```
:UltiSnipsEdit texmath
```
- (5) Vimtex: This is, in my opinion, the best package supporting writing L<sup>A</sup>T<sub>E</sub>X with Vim. The alternative, Vim-LaTeX, is much heavier and isn't as flexible. In combination with Ulti-Snips, vimtex can do much more.
- (6) Vim-tex-fold: Supports folding of a L<sup>A</sup>T<sub>E</sub>X document in Vim. This means that, for example, sections will be collapsed to a single line on ones display when they are not being edited.

**3.4. Using Vim.** I won't even attempt to give a full overview of how to use vim. There are many better sources online. I will give the bare minimum.

**3.5. Opening a document.** Open your terminal and navigate to the directory containing the document you want to edit. Call it example.tex. Run the following command:

```
vim example.tex
```

This will open the document in the terminal window.

### 3.6. Modes.

**3.6.1. Normal mode.** Vim can be in different "modes". The default being called "normal mode". In this mode you can navigate the document, delete things (characters, words, lines, etcetera), copy (called "yank" for vim), paste, etcetera. To move the cursor one symbol to the right, use the 'l' key; to move the cursor one symbol to the left, use the 'h' key; to move one line down, use the 'j' key; and to move one line up, use the 'k' key.

**3.6.2. Insert mode.** To actually type text, you need to enter the "insert mode" by pressing the 'i' key. Once in this mode the h,j,k, and l keys no longer navigate since they now need to perform their original function of entering the letters h,j,k, and l.

To get back to normal mode, press the escape key.

**3.7. Remapping your caps lock key.** When using vim one presses the escape key constantly to return to normal mode. The result is the famous "vim pinky". To avoid stretching for the escape button so much, some people (including me) remap the caps lock key to be a second escape key instead.

To do this on mac:

- (1) go to system preferences,
- (2) click on "keyboard",
- (3) click on the "keyboard" tab,
- (4) click on "modifier keys" in the bottom right, and

- (5) choose “escape” from the drop-down menu next to “caps lock”.

#### 4. DISPLAYING THE PDF

When editing notes quickly, it is useful to let the compiler run every time the document is saved. This is the default behavior of vim-tex. This means the PDF viewer one is using must change as the file changes. Most PDF viewers do not support this. In my opinion there are only two effective options for PDF viewers on a mac that support live updating: Skim and Zathura.

**4.1. Using Skim.** To install Skim enter the following into the command line:

```
brew cask install skim
```

**4.2. Using Zathura.** To tap, install, and link Zathura/the required plugins enter the following into the command line:

```
brew tap zegervdv/zathura
brew install zathura --with-synctex
brew install zathura-pdf-poppler
brew install xdotool
mkdir -p $(brew --prefix zathura)/lib/zathura
ln -s $(brew --prefix zathura-pdf-poppler)/libpdf-poppler.dylib
    $(brew --prefix zathura)/lib/zathura/libpdf-poppler.dylib
```

**4.3. Making a choice.** If using vim-tex, once you have determined which viewer you would like to use, add one of the following lines to your vimrc:

```
let g:vimtex_view_method='zathura'
let g:vimtex_view_method='skim'
```

and the pdf file will automatically open in your chosen viewer when it is compiled. Use \ll to compile a document in vim-tex. See the documentation of vim-tex for more information on PDF viewer support and compiling documents.

#### 5. WRITING A DOCUMENT

This section assumes my vimrc and L<sup>A</sup>T<sub>E</sub>X macros are being used. The preamble and document environment (specifically for taking notes) is triggered by

```
notes<tab>
```

with Ulti-Snips placeholders (toggled through with <ctrl>j>) at all of the places where things should be added.

To begin compiling:

```
\ll
```

To suggest a completion of a word:

```
<ctrl>n
```

To guess the correct spelling of the last misspelled word:

```
<ctrl>p
```

To add a word to the dictionary:

```
zg
```

To remove a word from the dictionary:

```
zug
```

To reset folds:

`\zx`

To fold current fold:

`\za`

Toggle whether current line is commented:

`\c_`

Build an environment out of whatever is in the current line:

`<ctrl>b`

Change tabs

`gt`

To write and customize snippets:

`:UltiSnipsEdit texmath`