1 Introduction

This file shows how to write an article using LaTeX.

LaTeX is a language for writing document, similar as Markdown. With sections, tables, labels, references, math expressions. Of course, it is known as a geek editor for mathematics.

This article is totally written with LaTeX.

2 Install

Any text editor can be used to write LaTeX files.

For macOS, MacTex is recommended, but it's hugo and up to 3.4GB.

Personally, I'm using Texpad which have a realtime PDF preview of your document.

The LaTeX file extension is *.tex.

3 Sytax

In this section, I will show you how to using the syntax.

3.1 Tables

Difficulty comparison of LaTeX and Markdown

Name	Section	Table	Link	Media	Math
LaTeX	easy	medium	-	-	-
Markdown	easy	easy	easy	-	-

3.2 Lists

Unordered list

- Atom
- vscode
- Vim

Ordered list

1. First, learn about the syntax
2. Then try yourself with an editor
3. Publish the article

3.3 Labels and references

If you want to reference a section in the article, we can use labels.

For example if you want to refer "3.2 List" here, you need to first set label for the section with labellabelname, then use reflabelname for the reference.

Refer to 3.2

3.4 Math

Use one pair of dollor sign to wrap inline Math expressions. For example, $E = mc^2$

Use two pairs of dollor sign to display math formula in a new line and centered.

3.5 Examples

From WikiPedia "Quantum mechanics"

$$E = h\nu$$

$$-\frac{\hbar^2}{2m}\frac{d^2\psi}{dx^2} = E\psi$$

$$\hat{p}_x = -i\hbar\frac{d}{dx}$$

$$\frac{1}{2m}\hat{p}_x^2 = E$$

$$\psi(x) = Ae^{ikx} + Be^{-ikx}$$

$$E = \frac{\hbar^2 k^2}{2m}$$

$$\psi(x) = C\sin kx + D\cos kx$$

$$\psi(0) = 0 = C\sin 0 + D\cos 0 = D$$

$$\psi(L) = 0 = C\sin kL$$

$k = \frac{n\pi}{L}$ $\quad n = 1, 2, 3, ...$

$$E = \frac{\hbar^2\pi^2 n^2}{2mL^2} = \frac{n^2 h^2}{8mL^2}$$

$$V(x) = \frac{1}{2}m\omega^2 x^2$$

$$\psi(x) = \sqrt{\frac{1}{2^n n!}} \cdot \left(\frac{m\omega}{\pi\hbar}\right)^{1/4} \cdot e^{-\frac{m\omega x^2}{2\hbar}} \cdot H_n\left(\sqrt{\frac{m\omega}{\hbar}}x\right)$$

4 References

[1] David Xiao.A beginner's Guide to LaTeX. https://www.cs.princeton.edu/courses/archive/spr10/cos433/guide.pdf

[2] LaTeX Mathematical Symbols. https://reu.dimacs.rutgers.edu/Symbols.pdf