

\LaTeX for dummies

Invitation for HDS Seniors

What is \LaTeX ?

Why is \LaTeX recommended in academic writing?

HDS PSCM KMUTT template

Basic usage of \LaTeX

- Structure of .tex file

- Typesetting in \LaTeX

- Citation and cross-referencing

- Equations and etc.

Advanced usage

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What is \LaTeX ?

- \LaTeX is a software system for **typesetting and document preparation**.
- Normally, \LaTeX engine doesn't behave as WYSIWYG (What you see is what you get.)
- \LaTeX is not only able to do a report. An illustration and a presentation are also included.

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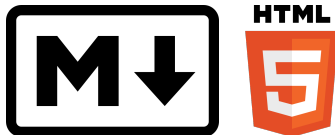
Example of WYSIWYG

YES!



1. What display shows to you on editor is really the same as what the audiences see.
2. No-code implementation (or sometimes, low-code.)

NO!



1. What display shows to you is a raw code. You must compile/open a file to show the result.
2. Coding implementation

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L^AT_EX engine (all of them are free.)

Online

Overleaf (registration is required.)

(<https://www.overleaf.com/>)

Offline [You must download TeX distribution and editor.]

(GUI editor) LyX (<https://www.lyx.org/Download>)

TeX distribution:

1. MikTeX (<https://miktex.org/download>)
2. TeX Live (<https://www.tug.org/texlive/>)

TeX editor:

1. TeXworks (bundled with MikTeX)
2. Texmaker (<https://www.xmlmath.net/texmaker/>)

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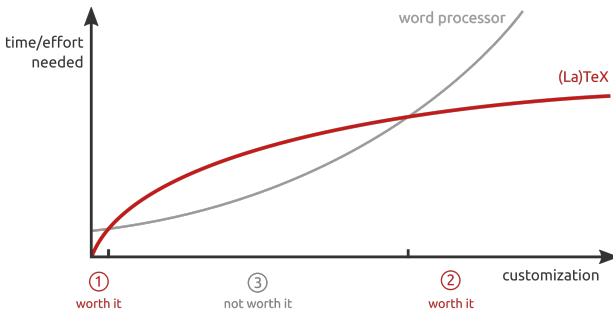
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Why is \LaTeX recommended in academic writing?

Disclaim: normally, \LaTeX is used by researchers on computer science, mathematics and physics disciplines. Not all researchers use \LaTeX to provide a document.

(Microsoft Word is preferable for the remains.)



L^AT_EX for academic writing

Pros*

- You only focus on your content; a format is not important.
 - references and citation style, table of contents, figures, ...
- Cross-referencing is doing well.
- Math equations are gorgeous.
- Many journals provide its article format.
- Many academic illustration is derived from L^AT_EX.
- Systematic management of document is quite easy (for programmer.)

*From the article *L^AT_EX for academics and researchers who (think they) don't need it* and my own experience about L^AT_EX

Trust me, I'm not a L^AT_EX seller.

Cons

- There're a lot of things that who is not favored in programming could be hate it. It means they require a lot of effort to learn it for you guys.
- Preamble, markdown language behavior, searching StackOverflow-like blogs for solving error/decorating if you'd like to customize your doc and non-WYSIWYG...
- Thai language environment is OK but not easy to use it compare to the other word processing software.
- If you have several *huge* files and your doc is in Thai, the compilation time is then large.

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That means in Overleaf, you will get timeout error. **If you'd like to run with the same, you must subscribe it. Your money is required**, but if you have any accounts under these organizations in the website <https://www.overleaf.com/for/universities>. You can use it for free with unlimited access.

My recommendation:

- Using offline platform, if you think that these files cannot size-reducible.
- Reducing size of these files is a good idea.

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THESIS TITLE

คนทำที่หนึ่ง
คนทำที่สอง
คนทำที่สาม

โครงการนี้เป็นส่วนหนึ่งของงานศึกษาค้นคว้า
ปริญญาวิทยาศาสตรบัณฑิต สาขาวิชาวิทยาศาสตร์ข้อมูล
คณะวิศวกรรมศาสตร์
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี
ปีการศึกษา 2564

This is my own template of HDS project report format that I have provided to public sphere. Here is a term of usage:

1. You **must not** modify anything in .cls file, if you're not trying to develop this thesis format.
2. This template can be used in any academic purpose of HDS PSCM KMUTT and KMUTT students.

How to use this template [No account required]

1. Go to this link <https://www.overleaf.com/read/vwtpfxztqgbv>.
2. Click “menu” and then click “Download”
3. You will have them as .zip file in your computer.

Options for this template

At the first row in `main.tex`, you will see

```
\documentclass[a4paper, <options>]{kmuttthesis}
```

- `a4paper` (recommend to have): A4 paper report
- `thai`: Thai format for the report
- `draftreport`: You will get “DRAFT” word in the header of the first page.
- `extra`: For HDS student, you must have this option. (See the demo)

Before you have a full L^AT_EX report

You must have these things before you write this report.

- Your project name in Thai and English
- You and your collaborators' names in Thai and English
- Your advisors and Co-advisors' names in Thai and English

and you must have these things before you send a draft.

- Your committees' names in Thai (or in English, if you'd prefer to have the report in English.)
- Abstract with keywords
- Report's content
- (Final draft) Acknowledgment

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Any questions about the template

Contact me:

kittapat.rat@mail.kmutt.ac.th only

I prefer to answer about this in only this email. Any messages to my other account will be neglected in any case.

Also, if you've any idea to develop the template, you may message me through the email.

Expected response time: less than a day, don't worry.

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Materials and preview for TL;DRers

Github:

`https:`

`//github.com/KittapatR/LaTeX-documentation-in-summary`

Structure of .tex file

```
\documentclass[<options>]{<class>}  
...  
<preamble> # packages, settings  
...          and configurations will be here.  
\begin{document}  
...  
<content> # contents in the article will be here.  
...  
\end{document}
```


Document class

- `article` → normally use in manual and journal articles
- `report` → this use in HDS PSCM KMUTT template
- `book` → no use in here but if we'd like to write an academic textbook, recommend this.
- `beamer` → this presentation uses this.

Reserved characters

The following symbol characters are reserved by \LaTeX because they introduce a command and have a special meaning.

\$ % ^ & _ { } ~ \

Demo of typesetting in \LaTeX

1. Font decoration
2. Paragraph and spacing
3. Title and headers
4. Tables and figures

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Demo of typesetting in L^AT_EX

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Referencing and citation

1. Bibliography and citation
2. section reference
3. equation reference
4. figure reference

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Equations and etc.

1. Inline equations
2. Display equations and its alignment
3. AMSmath and AMSsymb
4. AMSthm
5. Listings and verbatim
6. Algorithmic and algorithm2e
7. Tikz

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\LaTeX is Turing complete!

Most computer languages are Turing complete (computable with infinite memory and time for doing a procedure under certain rules) such as C, Python, SQL, CSS3, Microsoft Word, Minecraft.

Yes! \LaTeX is Turing complete. (Click to see its proof) BUT **what is its benefit for doing such task?**

- You can do “Game of Life” in \LaTeX .
- You can do “Ray-tracing” in \LaTeX .
- You can do “Model simulation including ODE” in \LaTeX .
- etc.


Further link for learning \LaTeX

Dr. John D. Lees-Miller's *An Interactive Introduction to \LaTeX*

1. <https://www.overleaf.com/static/latex/learn/free-online-introduction-to-latex-part-1.pdf>
2. <https://www.overleaf.com/static/latex/learn/free-online-introduction-to-latex-part-2.pdf>
3. <https://www.overleaf.com/static/latex/learn/free-online-introduction-to-latex-part-3.pdf>

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<https://tex.stackexchange.com/>

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Anybody can answer

The best answers are voted up and rise to the top



$$\begin{array}{c} \text{oxidation} \\ 2\text{H}_2 + \text{O}_2 \longrightarrow 2\text{H}_2\text{O} + 2\text{e}^- \\ \text{reduction} \end{array} \quad \oint \mathbf{E} \cdot d\mathbf{l} = - \frac{\partial \Phi_{B,S}}{\partial t}$$

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-1 votes **crosschecking cited references and cross references**

Hot Network Questions

-  Coin Flip Probability Independent or Not?
-  What is Neil Gaiman's "enormous debt" to The Jungle Book that he mentions in the acknowledgments in The Graveyard Book?
-  Question on Linear Regression: What is a good transformation for this data?
-  Why did Pippin insist on joining Denethor's army?
-  Isolation of viruses and Koch's Postulates in connection with terrain theory and claims that viruses don't exist
-  How safe is money in the bank?
-  Why doesn't the variation of resistivity with temperature go both ways?
-  Does a player character who becomes a vampire gain the vampire's Legendary Actions?
-  What are the benefits for a Harengon to be Small (*variant of Maelfrey*)?

TeX forum

<https://latex.org/forum/>

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It is currently Sat Jul 16, 2022 12:48 pm

LATEX	TOPICS	POSTS	LAST POST
 Text Formatting Information and discussion about LaTeX's general text formatting features (e.g. bold, italic, enumerations, ...)	2647	10669	Latex Error: Counter too larg... by rais  Sat Jul 02, 2022 10:03 pm
 Graphics, Figures & Tables Information and discussion about graphics, figures & tables in LaTeX documents.	4261	17058	using edge in tikz II by kenth  Fri Jul 15, 2022 10:14 am
 Math & Science Information and discussion about LaTeX's math and science related features (e.g. formulas, graphs).	1544	6411	leq and leqslant by Zsreba  Fri Jul 15, 2022 9:13 am
 Fonts & Character Sets Information and discussion about fonts and character sets (e.g. how to use language specific characters)	626	2581	12pt issues by djo  Thu Jun 23, 2022 10:33 pm
 Page Layout Information and discussion about page layout specific issues (e.g. header and footer lines, page formats, page numbers).	1886	7397	Why is my footer text going t... by mjk  Sun Jul 10, 2022 8:16 pm
 Document Classes Information and discussion about specific document classes and how to create your own document classes.	1162	4806	Error: can't print the title ... by dchevalier  Thu Jun 30, 2022 9:37 am
 General LaTeX specific issues not fitting into one of the other forums of this category.	4950	19813	No new pdf creation after upd... by peterb  Fri Jul 15, 2022 10:02 am

LATEX'S FRIENDS	TOPICS	POSTS	LAST POST
 BibTeX, biblatex and biber Information and discussion about BIBTEX - the bibliography tool for LaTeX	1520	5425	directory package : Using bot... by ...