Typesetting UTM Thesis Using LyX

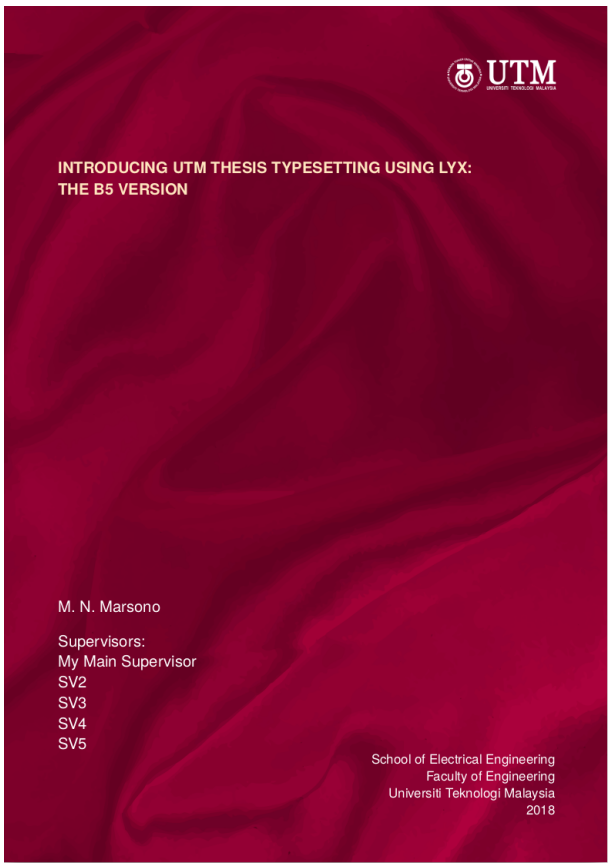
Official UTMthesis Version 6.4

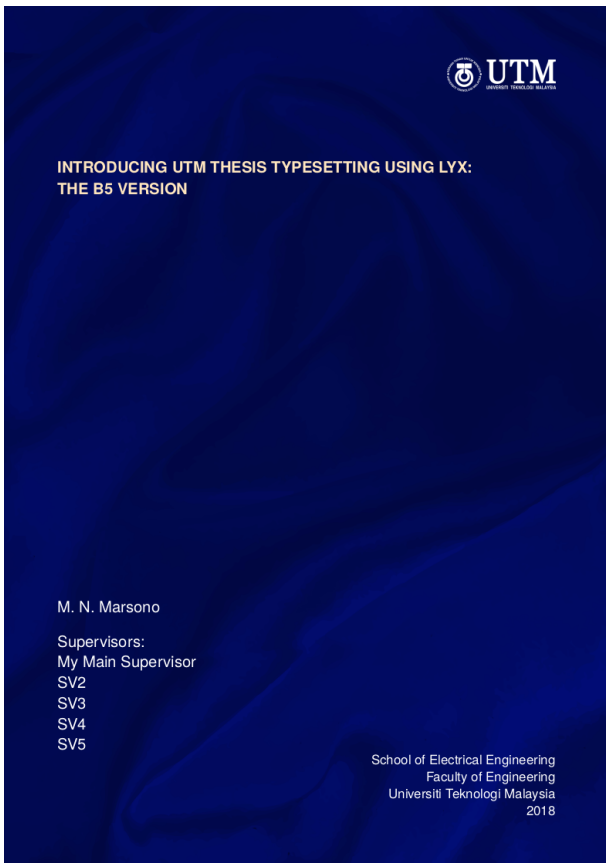
Muhammad Nadzir Bin Marsono
Assoc Prof of Electronics and Computer Eng.
School of Electrical Engineering
Universiti Teknologi Malaysia

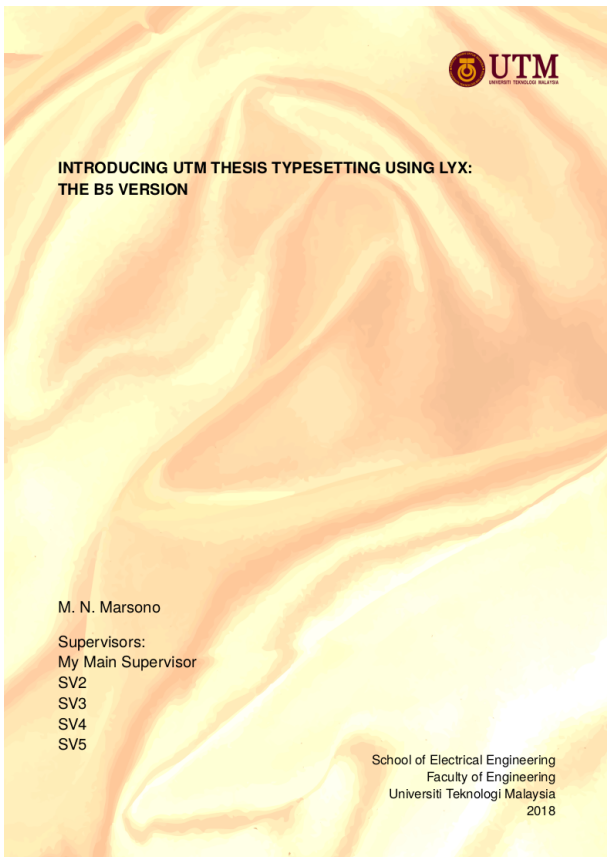
Outline

1. Formatting UTM thesis
2. Installation and set-up
3. Writing flow
4. Understanding LyX environment
5. Cross-referencing and bibliography
6. Mathematics!
7. Managing floats
8. Use notes
9. Conclusion

What is a Thesis?







Different *names* of a thesis

- An academic *thesis* is a proposition can be **challenged**
- According to UTM convention
  - UG FYP - *Final year project report*
  - Master by taughtcourse project - *project report*
  - Master by taughtcourse and research (mixed-mode) - *dissertation*
  - Master by research and PhD - *thesis*
- The main difference is in the substance, not form

Organizing ideas in the thesis

In general, thesis flow must have one solid story-line

- On the importance of the research
- On the current state-of-the-art solutions and their limitations
- The central concept of the proposed solution to the problem
- Validation of the solution
- Implication of findings and contribution to knowledge
- Significance of findings and the way forward

Writing thesis requires...

- Structuring thesis based on best practices (and your supervisor's recommendation)
  - This requires some forms of mind-map (or a good ToC)
- Visualize how ideas can be conveyed and results can be best represented
- Collating and formatting figures – very time consuming!
  - Use standard modeling diagrams when appropriate
  - Go for scalable/vector graphics
- Re-reading many references to connect all dots

UTM Thesis Manual 2018

- Each university has its own thesis style
- The UTM Thesis Manual 2018 defines on how theses should be formatted
  - Available to download from
    `http://sps.utm.my/thesis-formatting-2018/`
- UTM also provide templates
  - MS Word template
  - LaTeX/LyX templates
- Using one of these templates will save a lot of your precious time to deal with the thesis content

Why not just using MS Word?

- MS Word is the mostly used word processor, but only practical tool for (very) simple documents IMHO
- The use of LaTeX help typesetting complex documents such as books and theses
- TeX: Typesetting language with macro capability – credit to Donald Knuth
- LaTeX: Macro package built upon TeX – credit to Leslie Lamport
  - classes: Descriptions of a type of document, using LaTeX, e.g. the UTM thesis
  - styles: Alters the default behavior of LaTeX in some way
- LyX: Visual LaTeX to do its typesetting – credit to Matthias Ettrich
  - LyX is the LaTeX front-end
  - LyX is almost WYSIWYG (what you see is what you get)

LaTeX/LyX UTMthesis template

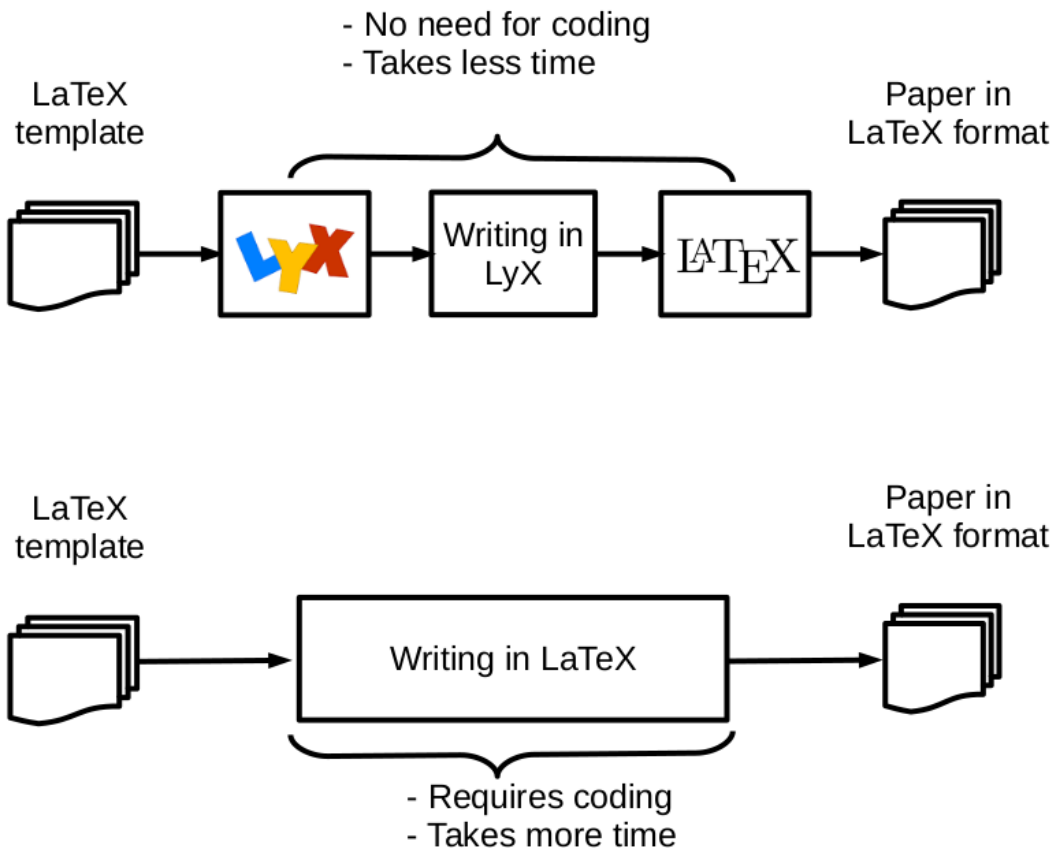
- This UTMthesis template satisfies UTM Thesis Manual 2018
- Some features
  - Auto-generates front pages, table of contents, references, list of tables/figures, and declarations
  - Easy referencing and figure/table/chapter numbering
- Always check for the newest class file on Github
  `https://github.com/utmthesis/utmthesis`

Thesis generation flow using LyX

- LyX is what you use to do your actual writing (GUI front-end, easier adoption)
- LyX converts your document to a series of text commands for LaTeX, generating a file with the extension `*.tex`
- LaTeX uses the commands in the `*.tex` file to produce printable output
  - Pdf through File ▷ Export ▷ Export [PDF (pdflatex)]
    - This is the normal generated output
  - Other options are available
    - For native LaTeX through File ▷ Export ▷ LaTeX (pdflatex)
    - HTML through File ▷ Export ▷ HTML

LaTeX and LyX Flow

- As LyX front-end is based on LaTeX back-end, both can co-exist (diagram by Mohamed Sultan)



Online access to LaTeX/LyX

- Web-based, no local installations are required
- For LaTeX user, you may check online template on Overleaf
  - Can be accessed from `https://www.overleaf.com/latex/templates/universiti-teknologi-malaysia-thesis-template/vhhykxgsxcym`
  - In LaTeX (text based), not LyX (visual)
  - Can be integrated with Grammarly using TextArea add-ons
- Use LyX on RollApp `https://www.rollapp.com/app/lyx`
  - Need subscription for saving to cloud storage

Local Installation

- Local installation is the usual choice for many
- Download and install either MikTeX or TeXlive
  - MikTeX can be accessed from `https://miktex.org/`
    - Minimal MikTeX will be installed
    - Alternatively, you can install full MikTeX from ProTeXt `https://www.tug.org/protext/`
  - Alternative to MikTeX, you may install TeXlive from `https://tug.org/texlive/`
    - Full installation will take 7 GB for complete TeXlive
- Download and install LyX
  - LyX can be downloaded here `https://www.lyx.org/`
- Packages will be updated over the Internet when installing LyX and when running UTM template (see next slide) for the first time

Downloading the Template

- Download UTM thesis template from `https://github.com/utmthesis/utmthesis` or from the link on the UTM SPS website
- Files required to run the template (better to download all files)
  - `utmthesis.cls` – class file version 6.4
  - `utmthesis.lyx`
  - `utmthesis.layout` – LyX layout
  - `*.bst` – BibTeX style file of your choice
- I share the minimal template for you to try here `https://drive.google.com/file/d/1PflC8xShfXnxsEoLhNb4SS5fbrjYCAdp/view?usp=sharing`
  - I will be using this to demo the template

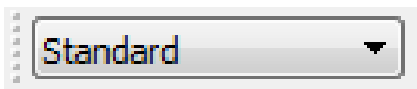
Testing the template

- Open `lyx-thesis.lyx`
- To generate thesis PDF
  - File ▷ Export ▷ PDF (pdflatex) to generate PDF in the folder OR
  - Click  generate a PDF quick-view
- A PDF should be generated
- In case of unsuccessful PDF generation
  - Open `utmthesis.layout` using a text editor
  - Check line 13
  - Change to Format 60 (ver. 2.2) or 66 (ver. 2.3)

Learning LyX on YouTube

- Many tutorials are available on YouTube on LyX (albeit the earlier versions)
- Some tutorials on using LyX 1.*
  - Video 2/5 `https://www.youtube.com/watch?v=Wq9ti7GGHrs`
  - Video 3/5 `https://www.youtube.com/watch?v=O5okEyYQ-Og`
  - Video 4/5 `https://www.youtube.com/watch?v=sJpfyydhAzo`
  - Videos 1/5 (installation) and 5/5 (specific template) can be skipped
- References in LyX `https://www.youtube.com/watch?v=EGnY486sbDI`

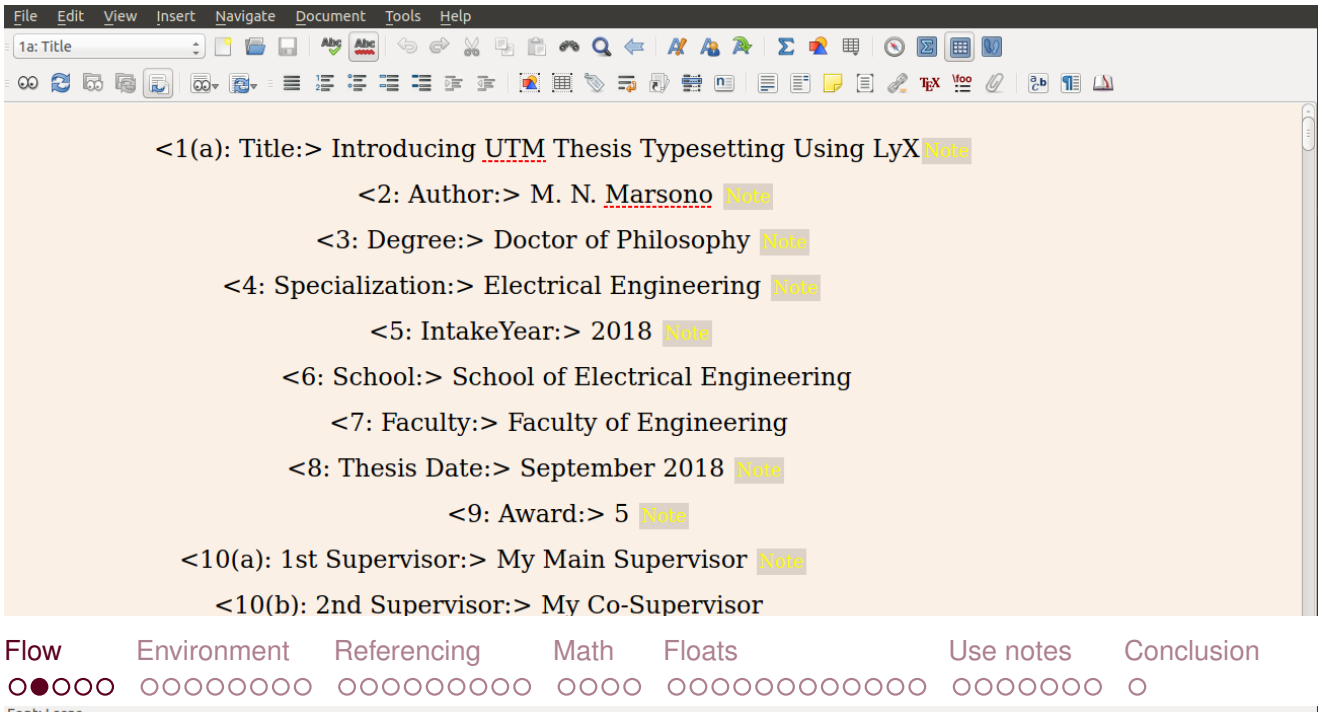
LyX UTMthesis writing flow

- Insert
  - Thesis information (author name, degree, faculty, etc)
  - Include preambles (abstract, abstrak (abstract in Bahasa Melayu), dedication, acknowledgement, etc.)
  - Write mainmatters (main chapters)
  - Insert the bibliography
  - Appendices if any
- Select sectioning from the *Environment* drop box 

  - Chapter
  - Section
  - Subsection etc.
- Refer to the notes provided in the template for further clarification

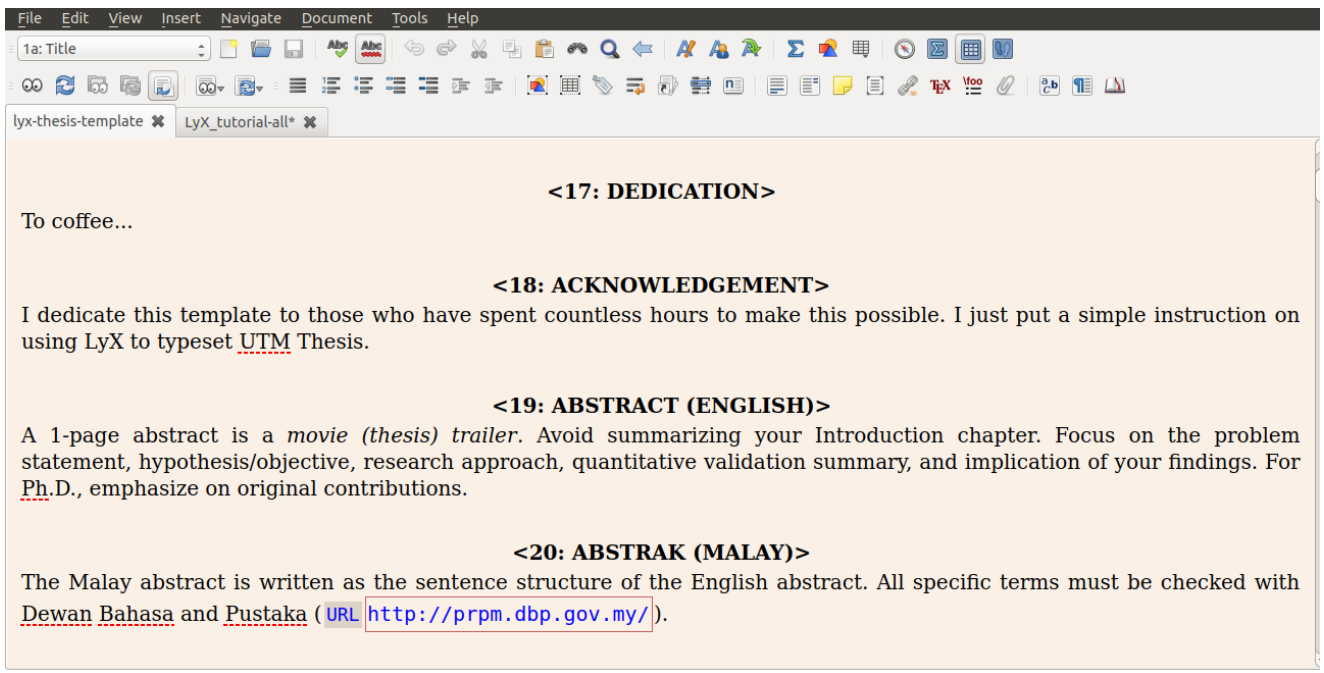
Thesis and author's information

- Some are OPTIONAL – delete when not in use.
- Degree, Specialization, and Intakeyear must be written properly – refer to your student card/offer letter
- We support up to FIVE supervisors – do not ask us why
  - If you have more then five supervisor, you need to seriously rethink your life choices (^_^)
- Use *Title Case*
  - LyX will make to uppercase when necessary



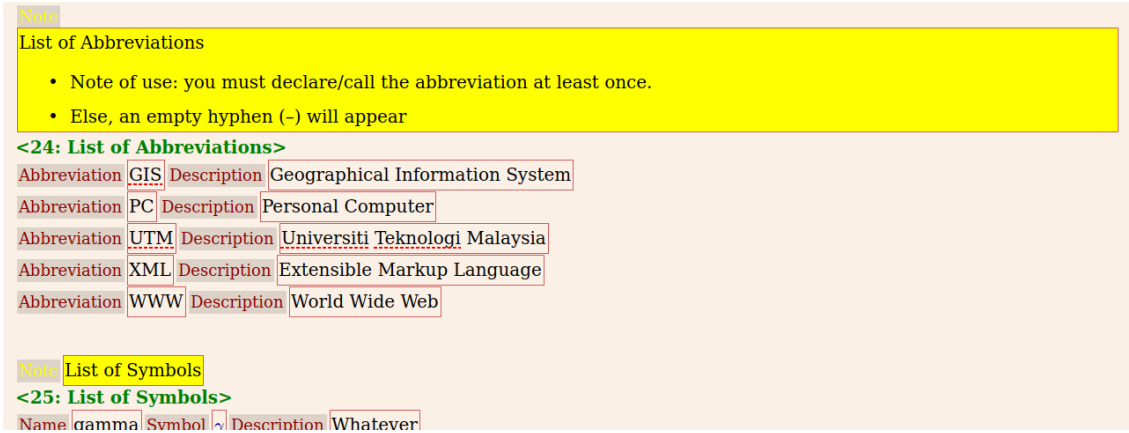
Preamble pages

- Acknowledgement
- Dedication
- Abstract
- Abstrak (abstract in Bahasa Melayu)
  - Please check with the Dewan Bahasa website `http://prpm.dbp.gov.my/` for special terms
  - Do not rely on Google Translate

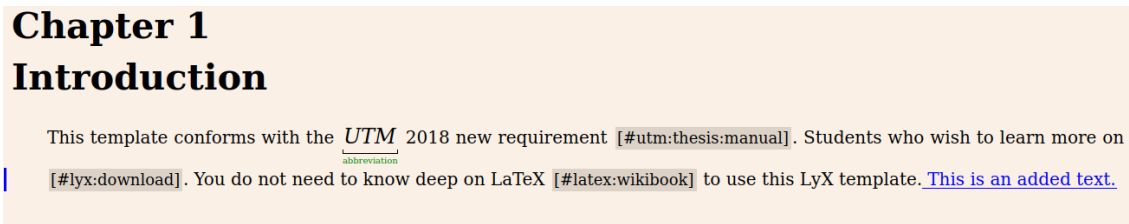


Abbreviations and symbols [1]

- List of Abbreviations
- List of Symbols
- Must be alphabetically sorted - *manually*



- To call an abbreviation or symbol, Insert ▷ New Inset ▷ Abbre



[1] This feature was contributed by Dr Loo Hui Ru

Main pages

- Main Matters: Parts, Chapters, and Sections
  - Chapter (e.g., 2)
  - Section (e.g., 2.1)
  - Subsection (e.g., 2.1.1)
  - Subsubsection (e.g., 2.1.1.1) – iff necessary
- Do not to go beyond this
  - Restructure your thought
  - There always options to restructure your chapters/sections
- If unable to do this, quit!

UTMthesis document class

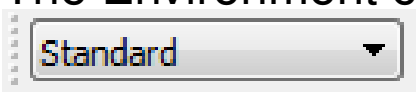
- Document classes are another major part of the WYSWYM (what you see is what you meant) philosophy
- It tells LyX how to typeset the document according to the document class, so you do not need to know how
- UTMthesis class is a book-type derived class, hence print on both sides by default
  - You can set set for *oneside* printing
- This is the endorsed version by SPS
- Some discrepancies in the manual (e.g., if the “Figure” in figure caption should be bold etc.,) have been verified by SPS

LyX is WYSIWYM, almost WYSIWYG

- WYSIWYM means what you see is what you meant
- The class file defines how the document should be typeset
- The hardest thing for new users is on how LyX handles white spaces
- A return (new line) means a new paragraph
  - As many times as you hit `Return`, you will only get one blank line
- A space means writing another word
  - As many times as you hit `Space`, you will only get one white space
  - On a blank line, LyX will not let you type even one space
- The Tab key will not move you forward one tab stop; in fact there are no tab stops!
- There is no ruler at the top of the page to let you set tabs or margins
- Fine-tuning white spaces in LyX can be done (only when necessary)
  - Protected Break, which you get by typing Ctrl+Return
  - Protected Space, which you get by typing Ctrl+Space

LyX environments

- Different parts of a document have different purposes; we call these parts environments
- Certain types of documents have special environments (an abstract and a title for journal, but not letter)
- An environment may require a certain font style, font size, indenting, line spacing, and more.
- The Environment choice box is located on the left end of the toolbar

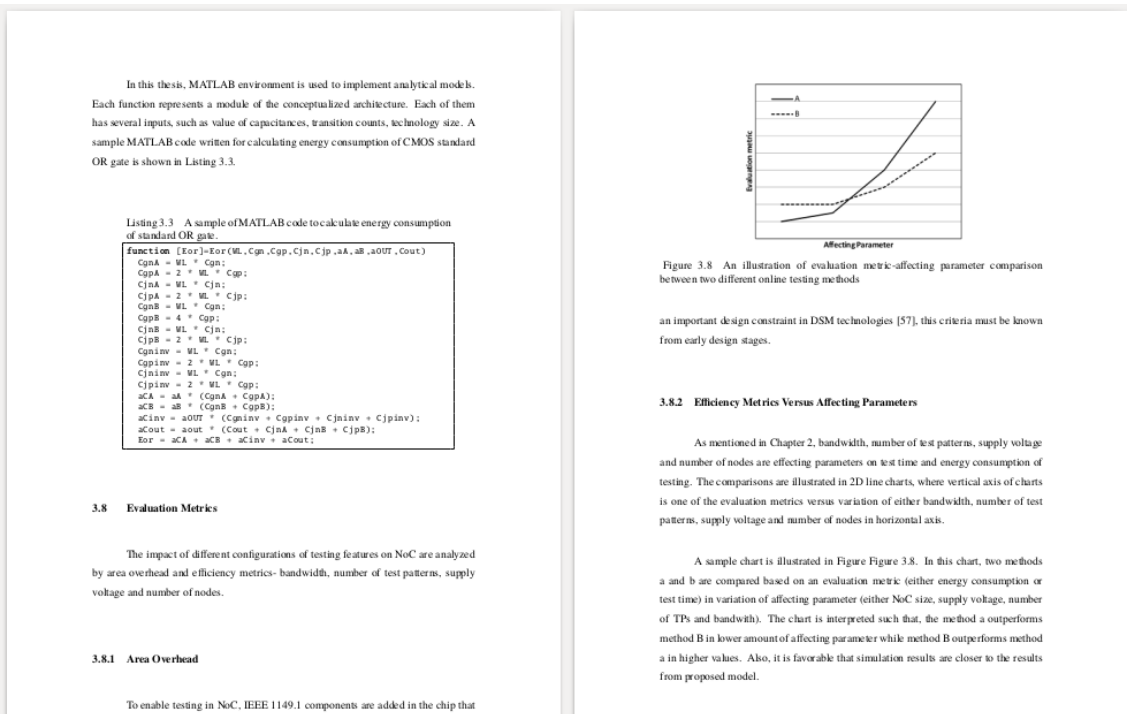


Basic features

- Undo – LyX has multiple levels of undo and redo. Currently limited to 100 steps
- Cut/Paste/Copy – Like MS Word
  - Even figures, but we do not suggest this as the figure will be in bitmap format
- Find/Replace
- Character Formatting
- Toolbar (tons of them) – Just need to get used to them

Paragraph alignment

- Edit ▷ Paragraph Settings dialog or click 
  - Justified – default
  - Left
  - Right
  - Center
- For vertical alignment default is raggedbottom



In this thesis, MATLAB environment is used to implement analytical models. Each function represents a module of the conceptualized architecture. Each of them has several inputs, such as value of capacitances, transition counts, technology size. A sample MATLAB code written for calculating energy consumption of CMOS standard OR gate is shown in Listing 3.3.

Listing 3.3 A sample of MATLAB code to calculate energy consumption of standard OR gate.

```
function [Eor]=Eor(WL,Cgn,Cgp,Cjn,Cjp,aA,aB,aOUT,Cout)
  CgnA = WL * Cgn;
  CgpA = 2 * WL * Cgp;
  CjnA = WL * Cjn;
  CjpA = 2 * WL * Cjp;
  CgnB = WL * Cgn;
  CgpB = 4 * Cgp;
  CjnB = WL * Cjn;
  CjpB = 2 * WL * Cjp;
  Cgninv = WL * Cgn;
  Cgpinv = 2 * WL * Cgp;
  Cjninv = WL * Cgn;
  Cjpinv = 2 * WL * Cgp;
  aCA = aA * (CgnA + CgpA);
  aCB = aB * (CgnB + CgpB);
  aCinv = aOUT * (Cgninv + Cgpinv + Cjninv + Cjpinv);
  aCout = aout * (Cout + CjnA + CjnB + CjpB);
  Eor = aCA + aCB + aCinv + aCout;
```

3.8 Evaluation Metrics

The impact of different configurations of testing features on NoC are analyzed by area overhead and efficiency metrics- bandwidth, number of test patterns, supply voltage and number of nodes.

3.8.1 Area Overhead

To enable testing in NoC, IEEE 1149.1 components are added in the chip that

Figure 3.8 An illustration of evaluation metric-affecting parameter comparison between two different online testing methods

an important design constraint in DSM technologies [57], this criteria must be known from early design stages.

3.8.2 Efficiency Metrics Versus Affecting Parameters

As mentioned in Chapter 2, bandwidth, number of test patterns, supply voltage and number of nodes are effecting parameters on test time and energy consumption of testing. The comparisons are illustrated in 2D line charts, where vertical axis of charts is one of the evaluation metrics versus variation of either bandwidth, number of test patterns, supply voltage and number of nodes in horizontal axis.

A sample chart is illustrated in Figure Figure 3.8. In this chart, two methods a and b are compared based on an evaluation metric (either energy consumption or test time) in variation of affecting parameter (either NoC size, supply voltage, number of TPs and bandwith). The chart is interpreted such that, the method a outperforms method B in lower amount of affecting parameter while method B outperforms method a in higher values. Also, it is favorable that simulation results are closer to the results from proposed model.

Using different character styles

- Ctrl+B will bold the text selection
- Ctrl+I or Ctrl+U will not work in LyX
- Italic: Emphasized style (toolbar button )
- Noun style (toolbar button )
- Can also be accessed from menu Edit ▷ Text Style
- Don't overuse character styles!

Lists and sublists

- Enumerate
- Itemized
- List (not native to LaTeX)
- Description
- Can be made nested

- Plan/elaborate the outline
  - A *plot* for your thesis writing
  - Target: *logical story* for the document
  - Results
    - Stand-alone tables/graphs
    - Describe each, then number crunch
    - Use Appendices for detailed items
- Get feedback from the supervisor
- If you are writing in a language other than your mother language, consider getting specialized editing help

Footnotes and margin notes

- [Acceptable] Footnotes can be added using the toolbar button  or the menu Insert ▷ Footnote
- [Only for textbook] Margin notes should not be used

Labels and cross-references

- The use of label and cross-reference
- Dynamic numbering of
  - `<reference>`: prints the float number, this is the default
  - `(<reference>)`: prints the float number within two parentheses, e.g. for Equation
  - `<page>`: prints the page number
  - `on page <page>`: prints the text "on page" and the page number (suggested)
  - `<reference> on page <page>`: prints the float number, the text "on page", and the page number
- I suggest using the last method, “on page <page>” will be added when necessary

Bibliographies

- If you make a statement, back it up with your own data or a reference
  - All references cited in the text must be listed
  - UTM supports either the numbering or author-year format
  - Try to avoid inclusion of references as footnotes
- We recommend dynamic (and smarter way) – Use BibTeX
- BibTeX is text based
- Some visualization tool such as JabRef can be used
- If you worked with EndNote for MS Word before, your references list database can be exported to BibTeX format

BibTeX samples

```
@article{CitekeyArticle,
author = "P. J. Cohen",
title = "The independence of the continuum hypothesis",
journal = "Proceedings of the National Academy of Sciences",
year = 1963,
volume = "50",
number = "6",
pages = "1143--1148",
}

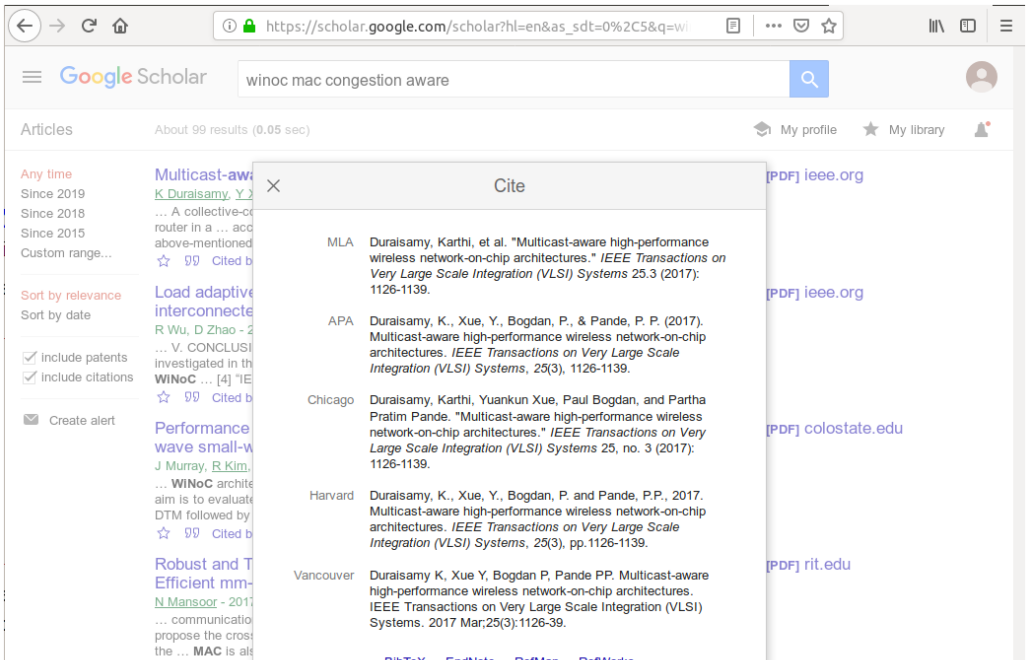
@book{CitekeyBook,
author = "Leonard Susskind and George Hrabovsky",
title = "Classical mechanics:  the theoretical minimum",
publisher = "Penguin Random House",
address = "New York, NY",
year = 2014
}
```

BibTeX styles

- UTM supports either numbering (mostly science and engineering) or author-year (social sciences) format
- Note that the latest UTM thesis manual allows any standard styles, provided that it is used consistently throughout the thesis
- For numbering, use `utmthesis-numbering.bst` (or any other numbering BibTeX styles such as `IEEEtran.bst`)
  - Document ▷ Settings ▷ Bibliography ▷ Citation Style ▷ Basic (BibTeX)
  - Click on BibTeX Generated Bibliography to change the BibTeX style Style ▷ Browse and select `utmthesis-numbering.bst`
- For author-year, use utmthesis-authordate.bst (or any other numbering BibTeX styles such as APA)
  - Document ▷ Settings ▷ Bibliography ▷ Citation Style ▷ NatBib (BibTeX)
  - Click on BibTeX Generated Bibliography to change the BibTeX style Style ▷ Browse and select `utmthesis-authordate.bst`

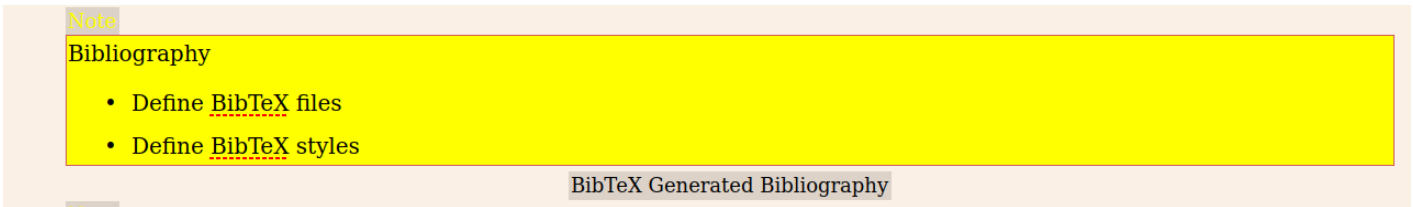
Where to get BibTeX items?

- Usually obtained from
  - Publishers
  - Google Scholar
  - Mendeley (citations manager)
- Usually, we don't manually define BibTeX from scatch
  - Usually require manual edit as some fields may be inaccurate or missing
  - Read `https://www.bibtex.com/e/entry-types/` for more details

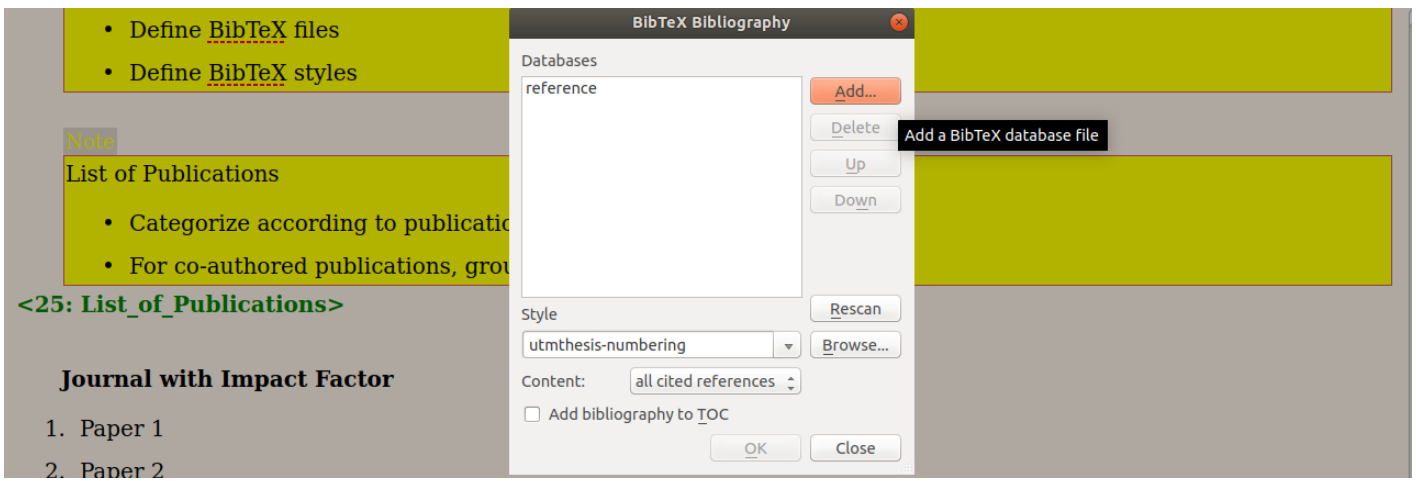


Inserting bibliography

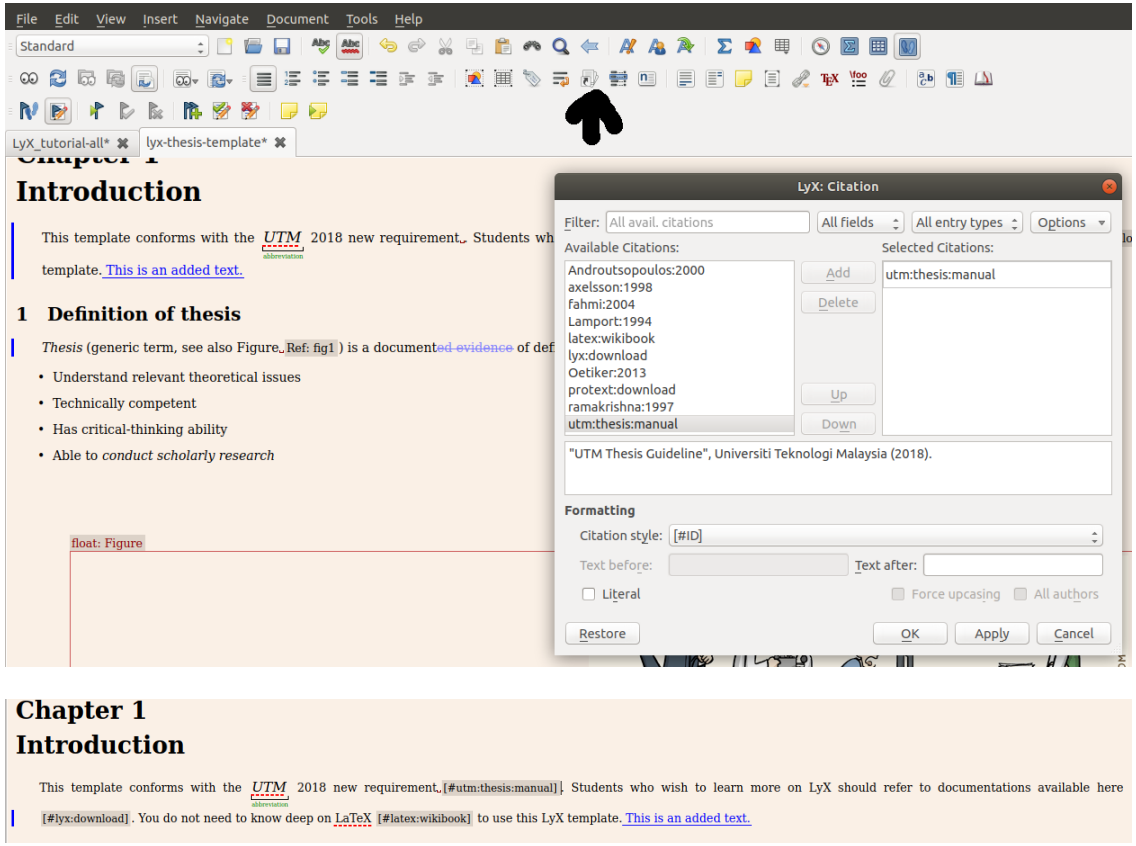
- At the end of the document (after the last chapter), insert Bibliography
- Can be accessed through menu Insert ▷ List/TOC ▷ Bib(la)TeX Bibliography



- Set reference BibTeX file (`*.bib`) and BibTeX style file (`*.bst`)



Inserting citation

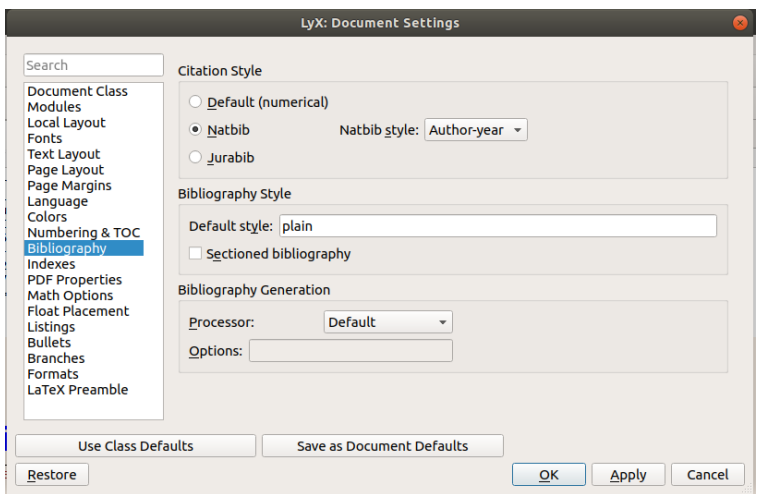


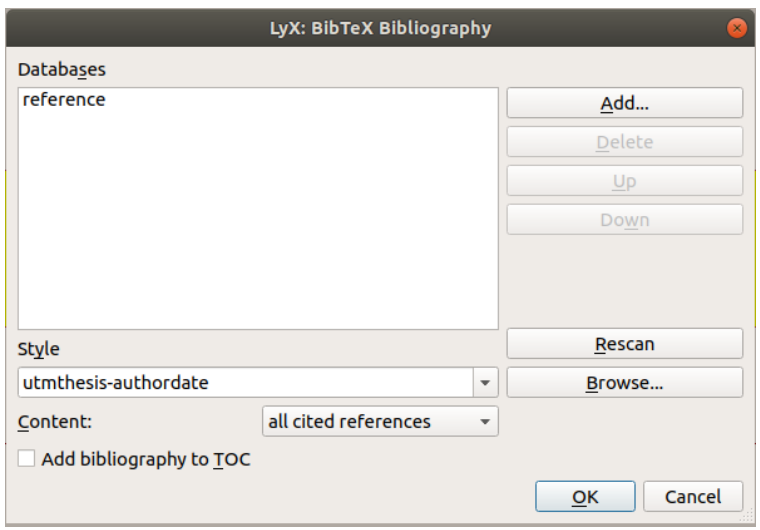
INTRODUCTION

This template conforms with the Universiti Teknologi Malaysia (UTM) 2018 new requirement [1]. Students who wish to learn more on LyX should refer to

BibTeX Author-Year style

- For author-year, use utmthesis-authordate.bst (or any other numbering BibTeX styles such as APA)
  - Document ▷ Settings ▷ Bibliography ▷ Citation Style ▷ NatBib (BibTeX)
  - Click on BibTeX Generated Bibliography to change the BibTeX style Style ▷ Browse and select `utmthesis-authordate.bst`





List of Publications

- After the list of references
- Should follow BibTeX style (convention) used in References

Note

List of Publications

- Categorize according to publication types.
- For co-authored publications, group them as “Other Publications”

<25: List_of_Publications>

Journal with Impact Factor

1. Paper 1
2. Paper 2

Indexed Journal (SCOPUS)

1. Paper 3

Non-Indexed Journal

1. Paper 4

Typesetting Math

- Three types
  - Numbered equations
    - Single- or multi-line equations are possible
    - Use of `Eqnarray` is encouraged
  - Inline formula
    - Use toolbar button  or from menu Insert ▷ Math ▷ Inline Formula
    - Mainly limited to simple expression

Walkthrough of some Math features

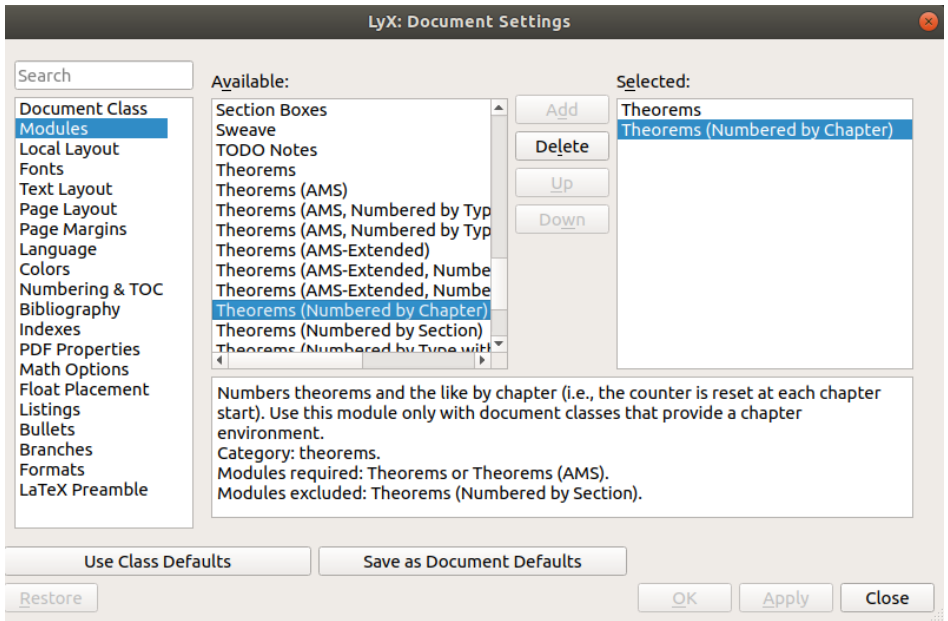
- Exponents and Subscripts – e.g., x^2y, you will get x^{2y} and type a_1 to get a_1
- Fractions – by typing \frac or using the icon $\frac{a}{b}$ in the Math Panel
- Roots – using the Math Panel button $\sqrt{\square}$ or the commands \sqrt or \root
- Operators with Limits – Sum ($\sum$) and integral ($\int$) operators
- Math Symbols – includes Greek, Operators , Relations, Arrows. Also AMS additional symbols
- Altering Spacing – using protected space

More on Math features

- Functions – function macros, such as sin, lim, etc.
- Accents – circumflex, tilde, breve, etc through command
- Brackets and Delimiters – Auto-sizing delimiter via icon
- Arrays and Multi-line Equations – Matrices are entered using the `Math Panel` matrix button 
- Cases – Insert ▷ Math ▷ Cases Environment or the command cases

Theorems

- LyX supports theorem, definition, etc.
- Go to Document ▷ Settings ▷ Modules



Managing floats

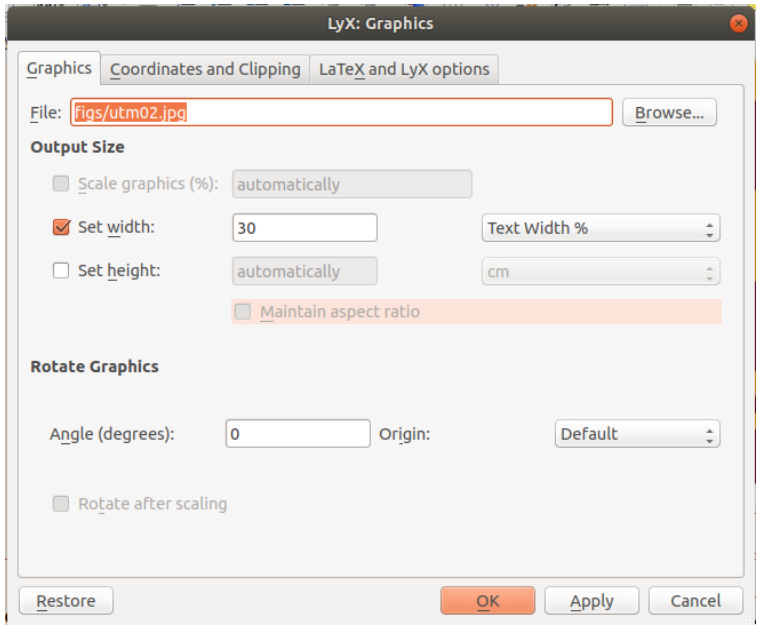
- Figures and tables float in the text
  - A float doesn't have a fixed location
  - It can float forward or backward to wherever it fits best to get a high quality layout
  - Caption as part of a float
- Float Placement
  - `Here if possible`: try to place the float at the position where it is inserted (default in UTMthesis)
  - `Top of page`: try to place the float at the top of the current page
  - `Bottom of page`: try to place the float at the bottom of the current page
  - `Page of floats`: try to place the float at an own page
- You can insert a figure float inside another figure float to create subfigures
  - Insert ▷ Float ▷ Figure and again, Insert ▷ Float ▷ Figure

Graphics and images

- A good thesis needs good diagrams/graphs/illustrations
  - Spend some time doing in properly
  - A good picture tells a thousand words
- Place the cursor and click on the toolbar icon  or select Insert ▷ Graphics from the menu
- Use scalable images such as SVG, EPS, PDF
  - Normally one can't convert a bitmap image into a scalable one, only vice versa
- You can copy and paste as well (just like MS Word) but will result in bipmap image
  - Not good enough
  - If you drew diagrams using Microsoft Word, you may copy-and-paste it to Visio or PowerPoint – then export as scalable images

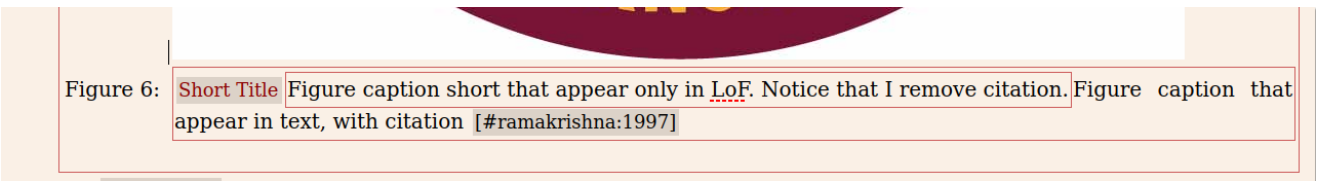
More on graphics and images

- Set dynamic width of figures/tables



More on graphics and images

- Citations should not be included in LoF, LoT
- Short float caption without citations
  - Click on figure caption, *Insert* ▷ *Short Title*



Tables

- If you need to show exact values (instead of trend for graphs), use tables instead.
- Insert a table using either the toolbar button  or the menu Insert ▷ Table
- Use with cross-referencing
  - Use ctrl+space so that “Table” and “Table number” are concatenated as one, i.e., will not be in separate lines

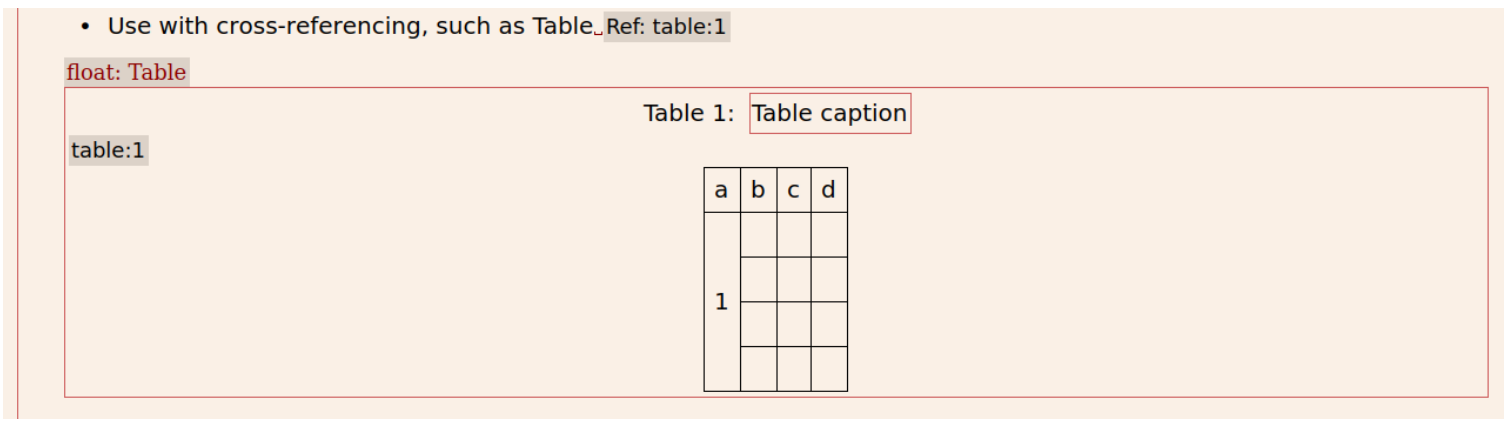
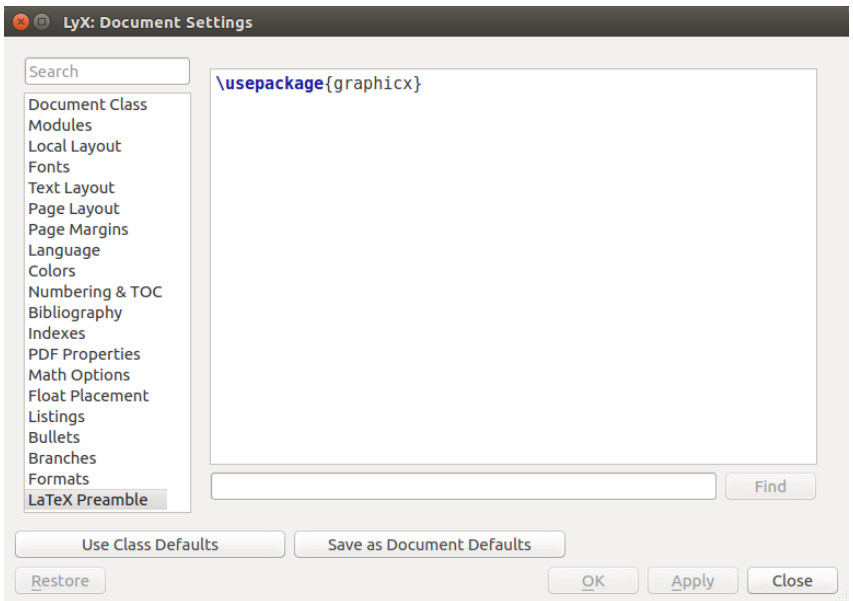


Table resize[2]

- Add `graphicx` package Document ▷ Setting ▷ LaTeX Preamble



[2]This tutorial on writing algorithm is done by Mr Mohammed Sultan Ahmed Mohammed

Table resize (cont'd)

- Using LaTeX command (Ctrl+L), add the following command inside table float before the table: `\resizebox{\textwidth}{!}{`
- Also using LaTeX command, close the bracket directly after the table: `}`

float: Table

Table 1: Example

```
\resizebox{\textwidth}{!}{
```

Table Table Table Table Table Table	Table Table Table Table Table Table	Table Table Table Table Table Table
Table Table Table Table Table Table	Table Table Table Table Table Table	Table Table Table Table Table Table
Table Table Table Table Table Table	Table Table Table Table Table Table	Table Table Table Table Table Table

```
}
```

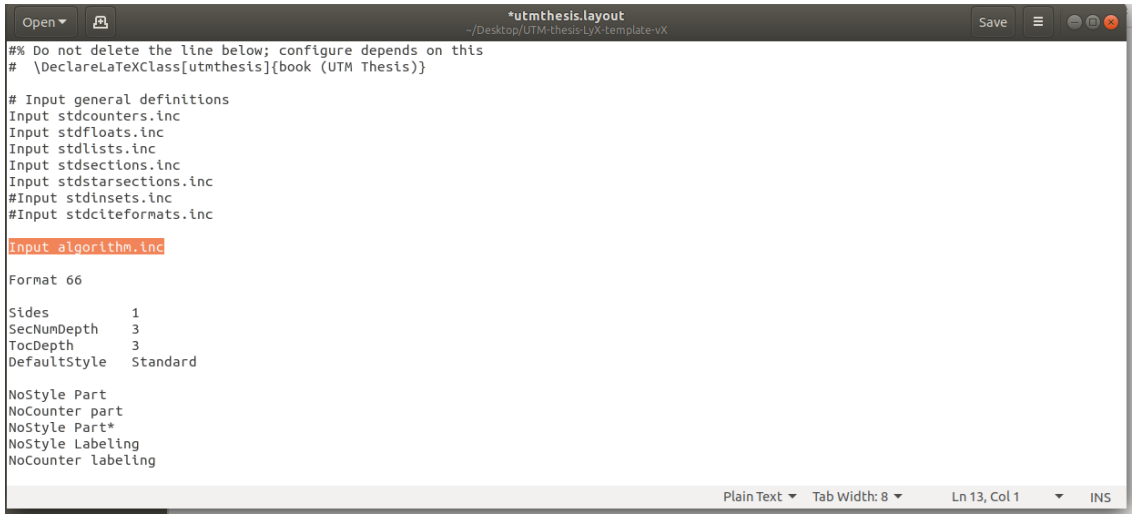
- Take note that table resize is to justify the size of a table after you have set column width
- Too much scaling will make table font too small compared to the main text

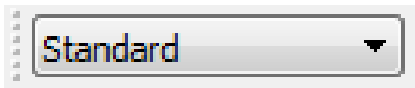
Algorithms[3]

- Use algorithm and algorithmic packages
- Download the latest version of LyX Algorithm-Style Layout from `http://bgu.perso.libertysurf.fr/`
- Copy `algorithm.inc` file to LyX layouts folder
  - Layouts folder in Windows: `<path-to-LyX-installation>\Resources\layouts`
  - Layouts folder in Ubuntu: `/usr/share/lyx/layouts`
- Copy `algolyx.sty` file to your working directory
- Add `Input algorithm.inc` to your LyX .layout file

[3] This tutorial on writing algorithm is done by Mr Mohammed Sultan Ahmed Mohammed

Algorithms



- Insert an algorithm float Insert ▷ Float ▷ Algorithm
- Change the text layout style inside the algorithm float to either `Algorithm` or `Algorithm (num)` using the upper left-hand 

drop-down menu

Algorithms

- Write your algorithm

float: Algorithm

Algorithm 1: Calculate $y = x^n$

Require: $x \geq 0$
Ensure: $y = x^n$
* $y \Leftarrow 1$
* $X \Leftarrow x$
* $N \Leftarrow n$
while $N \neq 0$
if N is even
* $X \Leftarrow X \times X$
* $N \Leftarrow N/2$
elseif {N is odd}
* $y \Leftarrow y \times X$
* $N \Leftarrow N - 1$
endif
endwhile

Algorithm 1 Calculate $y = x^n$

Require: $x \geq 0$
Ensure: $y = x^n$
  $y \Leftarrow 1$
  $X \Leftarrow x$
  $N \Leftarrow n$
  while $N \neq 0$ **do**
    if N is even **then**
      $X \Leftarrow X \times X$
      $N \Leftarrow N/2$
    else if {N is odd} **then**
      $y \Leftarrow y \times X$
      $N \Leftarrow N - 1$
    end if
  end while

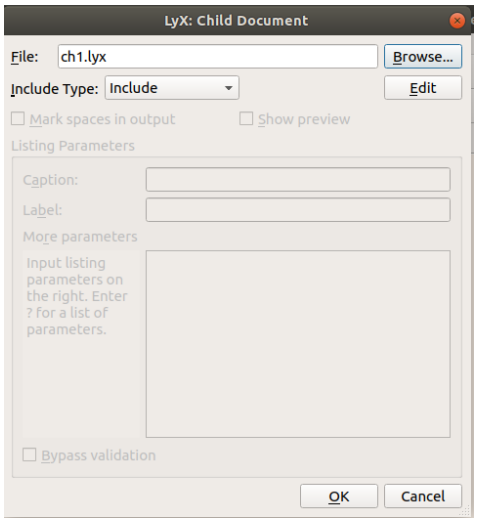
- You have to use reserved keywords

`if`	`endif`
`for/forall`	`endfor`
`while`	`endwhile`
`repeat`	`until`
`loop`	`endloop`

- Use (*) symbol in front of unreserved keywords

File listings

- Insert ▷ File ▷ plain text to insert ext in verbatim mode
- Insert ▷ File ▷ external document to insert PDF or XFIG figures
- Insert ▷ File ▷ Child document
  - You can split chapters as individual LyX files and called using *include* command – faster compilation and better writing overview



  - Other options are *input, verbatim, program listing*
  - Verbatim in typewriter font
  - Program listing can be configured language-aware

Program listings

- Insert ▷ File ▷ Child document
- You may change the type to program listing and configure it as you need
  - `breaklines=true`
  - `captionpos=b`
  - `frame=tb`
  - `language=Python`
  - `commentstyle={\normalfont\textit}`
  - `keywordstyle={\textbf}`
- Refer to `Listings` Latex package.

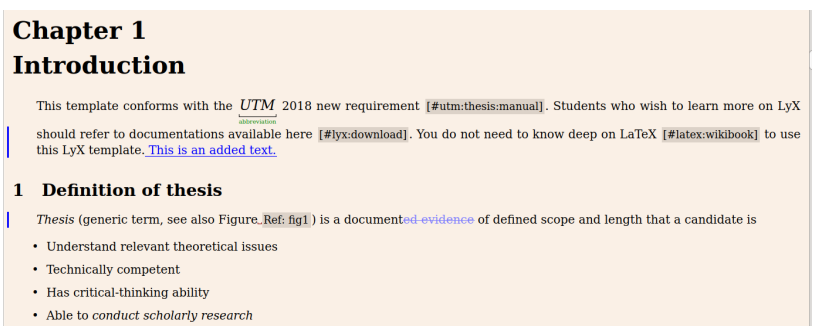
Turn on the spelling checker

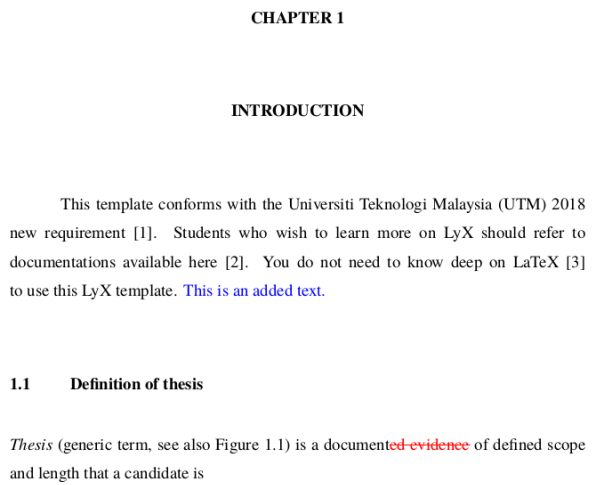
- Sloppily-written thesis spells disaster
- If the examiners feel that you could care less with your thesis, they will do likewise
- Tools ▷ Preferences ▷ Language Setting ▷ Spellchecker ▷ Spellchecker engine
  - Turn on Spellcheck to check continuously
- Having a spellcheck does not fix sentence structure or grammar
- Do use additional tools (Online grammar check or any other tools)
  - To improve your manuscript quality
  - To reduce the chances of your supervisor having a headache while reading your thesis



Track changes between reviews

- Revision is a daunting process
  - Help your supervisor to visualize changes been made
- Document ▷ Change tracking ▷ Track changes
- If you need to show the changes in pdf, select Document ▷ Change tracking ▷ Show changes in output





Using specialized packages

- UTMthesis uses the following packages

  - `acronym`
  - `algorithm`
  - `caption`
  - `emptypage`
  - `enumitem`
  - `geometry`
  - `hyperref`
  - `ifplatform`
  - `newtxmath`
  - `newtxtext`
  - `nowidow`
  - `parskip`
  - `pdfpages`
  - `setspace`
  - `tocloft`
  - `tocvsec2`

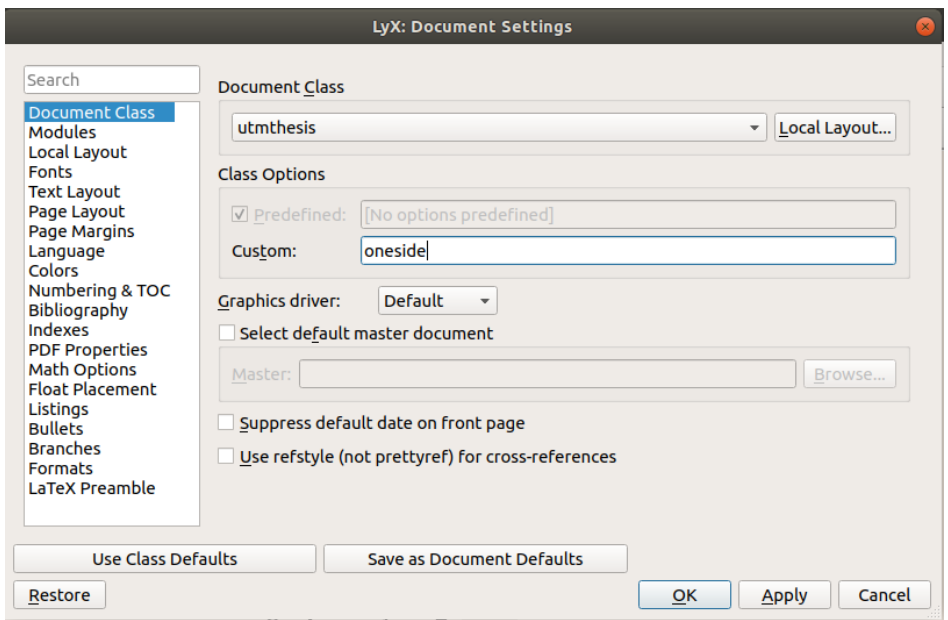
- Do not re-declare these packages in Document ▷ Setting ▷ LaTex Preamble
- If you need to include advanced features and/or specialized packages, potentially some packages may generate errors due to conflict with used packages in `utmthesis.cls`
  - Add a package at a time when necessary

Fine typesetting

- You may need to do post-writing customization
- Orphan and widow lines
  - Only perform fine typesetting (page break, vertical skip, etc.) before finalizing the document
  - Forced page break may be required
    - Insert ▷ Formatting ▷ Clear Page (open any)
    - Insert ▷ Formatting ▷ Clear Double Page (open right)
- Float placements
  - Some float may be too far from the referencing text, or
  - On a page on its own
  - Right-click on the float
  - Settings ▷ Advanced placement options ▷ Here if possible

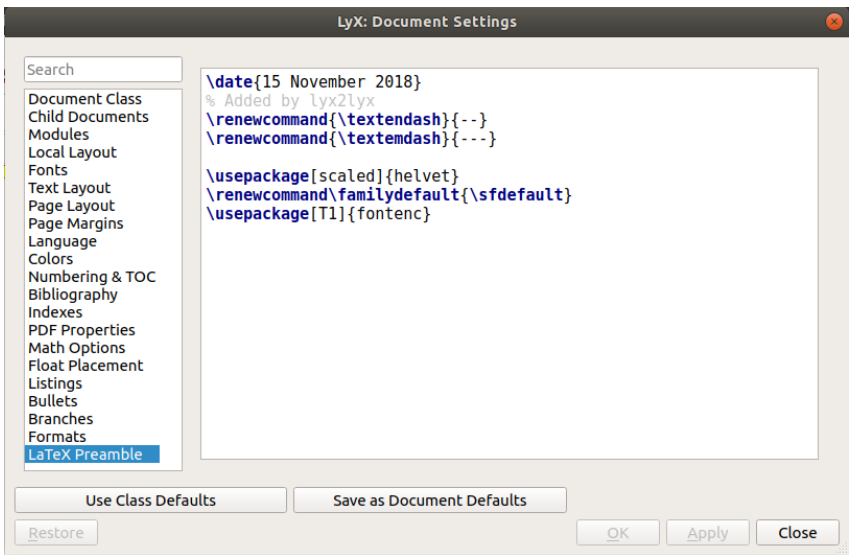
One-side or double-side printing

- UTM allow either single or double-sided printing for submission of thesis for oral examination purposes (UTM Thesis Guideline, 2018) Section 2.3 on page 13
- By default, the template is for double-side printing
- To change to a single-sided document Document ▷ Settings ▷ Document Class, type `oneside` in Custom Class Options



Font type

- You can also choose different font types (UTM Thesis Guideline, 2018) Section 2.4 on page 14–15.
- Document ▷ Settings ▷ Fonts ▷ Default family then select either Roman (default) or Sans Serif
- You may also define font type packages in LaTeX preamble Document ▷ Settings ▷ LaTeX Preamble



- Refer to `http://www.tug.dk/FontCatalogue/sansseriffonts.html` for other font options.

Known issues

Some reported bugs (system-specific issues)

- Spacing between a section title and the first paragraph thereafter (MikTeX on Windows)
  - Define LaTeX preamble Document ▷ Settings ▷ LaTeX Preamble

```
\usepackage{titlesec}
\titlespacing*{\section} {0pt}{2\baselineskip}{\baselineskip}
\titlespacing*{\subsection} {0pt}{2\baselineskip}{\baselineskip}
```

- Use of the `babel` package messed up with the preamble pages
- Use of the `notoccite` package messed up the ToC, LoT, and LoF

Last words

- We could not cover all grounds under-the-sun, as we know only the requirement in EE and EEE
- LaTeX/LyX are not a silver bullet to make thesis writing automated
- You most probably need to read further on beyond-basic LaTeX and LyX functions
- We (my students, other volunteers and I) receive a lot of questions or requests to solve some issues
  - Sometimes, due to multiple constrains, we are unable to help more that what was expected
  - Or we could not know more that the one asking (the question)
- We all volunteer in this endeavor believing that knowledge is to be passed to others