**The Dissertation Committee for (Insert your Official UT Name) certifies that this is the approved version of the following dissertation:**

# A Quick Guide to Starting your UT Thesis with LaTeX second line

**Committee:**

Ada Lovelace, Supervisor

James Bond

Professor 3

Professor 4

Professor 5

# A Quick Guide to Starting your UT Thesis with LaTeX second line

**by**

**(Insert your Official UT Name), (list your previous degrees here)**

## Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

## Doctor of Philosophy

**The University of Texas at Austin**

**May 2020**

Put your dedication here.

# Acknowledgments

Put your acknowledgments here. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam

vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

(Insert your Official UT Name)

*The University of Texas at Austin*
*May 2020*

# Abstract

## A Quick Guide to Starting your UT Thesis with LaTeX second line

(Insert your Official UT Name), Ph.D.
The University of Texas at Austin, 2020

Supervisor: Ada Lovelace

Put your abstract here. Should not exceed 350 words. It should be a continuous description, not disconnected notes or an outline

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare

odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

# Table of Contents

# List of Tables

# List of Figures

# Nomenclature

| | |
|---|---|
| $c$ | Speed of light in a vacuum inertial frame |
| $h$ | Planck constant |

# Chapter 1
# Introduction

If you're already experienced with LaTeX, there's probably nothing here you don't already know. If you're just getting started, congratulations! It will be frustrating at times but it is absolutely worth it. In no way is this introduction comprehensive, but it'll give you enough of a walkthrough to get started.

## 1.1 Installing LaTeX

You may or may not already have LaTeX installed on your system. If you have a Linux machine, you almost certainly do, whereas with Windows that may be less likely. You can find information about solutions for your operating system on the LaTeX project website at http://latex-project.org/ftp.html. More generally, http://latex-project.org contains a wealth of information for both beginning and advanced users.

## 1.2 Your project directory

In this directory you will see a couple folders and some other files. These are:

- This document.
- A folder titled "figures": if you'll be including a lot of images in your thesis, you can keep them organized here. This folder is optional, but handy if you like things tidy.
- A folder titled "packages": you will likely need to make use of some additional packages or style files depending on what your thesis will contain. As with the figures folder, this is optional but handy.
- Several files with the extension `.tex`. These are the most important, because these are where you will actually type your content. One in particular, `ut_thesis.tex`, is the main `.tex` file for the thesis, and includes all of the document-level formatting declarations and other important information (more on this later). The others contain the content for individual chapters, which is much tidier than trying to type your entire thesis in one long file.

- A file with the extension `.bib`. This is your bibliography file, where you'll keep information about all the sources you cite in your thesis. It contains a few sample references for different common types of sources, though of course there are many others.

- Several other files, with the extensions `.log, .aux, .toc,` and `.bst`. LaTeX generates these automatically when it produces your document, and you'll probably never have to interact with them – just leave them as they are.

### 1.3 Your main .tex file

This document was generated from the file `ut_thesis.tex`. Let's take a quick tour of that file. Open it up, either using the editor in a LaTeX front-end like MacTex, or just using your favorite text editor. You will see at the top a lot of lines of text that begin with a % sign. That character is used for making comments in your TeX code, which means that nothing following it on a line will appear in the document being produced. 28 lines down you will see the first important line of code, which tells LaTeX what kind of document this is. You don't need to change much here but if you want the text to be different than 11 pt, this is where you indicate that.

Below this line is the preamble, which is a series of commands that do a variety of things: a) they tell LaTeX what additional packages you need to accomplish certain formatting tasks; b) they allow you to specify other document characteristics like spacing and whether this is a Master's or Ph.D. thesis, and c) they enable you to provide information that will be used to generate the front matter of your thesis (title page, signature page, etc.). Each of these commands is accompanied by a comment describing what it does and indicating any information you need to provide.

The preamble ends when you see the command `\begin{document}`. Beyond that point is where you're actually generating content. First, you'll see a series of commands that will generate the different pages in your front matter. Each of these commands references further instructions in `utthesis2.sty` (located in the packages folder), which you probably won't have to interact with at all. In a couple cases, such as creation of your acknowledgements or abstract, you will have the opportunity to supply your own text, either directly in this file or in separate .tex files (recommended).

After the table of contents you now begin to create the chapters of your thesis.

This has been done a couple times as an example, along with an appendix. Finally, you see commands that generate your bibliography and your vita, and the command to end the document.

### 1.4 Writing your content

The biggest difference between LaTeX and programs like Microsoft Word is how you go about writing your content. In Word, the document you write in looks just like the finished product, and you have to go about the painstaking process of formatting everything at the same time as you're figuring out what to say. In LaTeX, these two tasks are separate. A style file (here, `utthesis2.sty`) dictates how the final product will look, and you can just focus on what you're saying. Once you get used to the relatively Spartan appearance of your text editor, it's quite nice not to have to deal with formatting considerations while you write.

The first thing you need to do is make sure you are using an appropriate text editor. Most current LaTeX distributions, such as MacTeX, have built-in editors that will work great. If you already have a favorite text editor, such as Emacs or Vim, that's great too. The important thing, as when writing any sort of code, is to not use word processing software or any program that will attempt to autocorrect or reformat your text.

#### 1.4.1 Spaces and Carriage Returns

One difference between LaTeX and conventional word processing software is how spaces and paragraphs are handled. In LaTeX, any number of blank spaces and/or a single carriage return yield one space between words. Any number of blank lines yields a new paragraph. The following examples all produce the same output, shown on the bottom line of (1):

(1)
- `Cats are the best!`
- `Cats  are  the  best!`
- `Cats  are`
  `the best!`
- Cats are the best!

| Animal | Size | Ferocity |
|---|---|---|
| Cow | Large | Low |
| Lion | Large | High |
| Raccoon | Small | High |
| Mouse | Small | Low |

Table 1.1: Size and ferocity of selected mammals. See [4].

However, with a blank line inserted, the text would be broken up into the end of one paragraph and the beginning of the next. This is plainly visible if you read through `intro.tex`, which contains the content of this chapter. This file is a good example of many common techniques and tricks you can make use of in producing your own document.

One potentially unfamiliar aspect of document preparation in LaTeX, which is recommended but not required, is the habit of hitting return at the end of each line in your .tex file. It's not necessary, but it makes your .tex code much more readable especially if someone is viewing it in a relatively old-school text editor. Since carriage returns are just treated as a space in LaTeX, hitting return at the end of a line has no effect on the document output. Pretend you're using a typewriter!

### 1.4.2 Tables and Figures

You'll almost certainly want to include some tabulated data and maybe some figures too. Both of these can be done very straightforwardly. Table 1.1 was generated with the following code:

```
\begin{table}
  \begin{center}
    \begin{tabular}{l||c|r}
      Animal & Size & Ferocity \\ \hline
      Cow & Large & Low \\
      Lion & Large & High \\
      Raccoon & Small & High \\
      Mouse & Small & Low
    \end{tabular}
    \caption{Size and ferocity of selected mammals. See \cite{henley:1969}.}
    \label{tab:sample-table}
  \end{center}
\end{table}
```

The line `\begin{tabular}{l||c|r}` indicates that the table will have 3 columns, and that they will be left-, center- and right-aligned respectively. Additionally, there will be two vertical lines separating the first two columns, and one separating the last two. In each row of the table, the & sign determines column boundaries, and the double backslash (\\) indicates the end of the line. Note that the code is indented after each `\begin` statement and de-indented after each corresponding `\end` statement – this makes it easier to read. Make sure to put your label right after the caption or the numbering can start to do weird things.

Figures are even easier. Figure 1.1[1] was produced using the following code:

```
\begin{figure}[ht]
  \begin{center}
    \includegraphics[width=5in]{./figures/kitties.jpg}
    \caption{This is a sample figure. Use .jpg, .pdf, or .png for best results.}
    \label{fig:sample-fig}
  \end{center}
\end{figure}
```

[1]Their names are Bert and Ernie. Also, this is an example of how to make a footnote.

Figure 1.1: This is a sample figure. Use .jpg, .pdf, or .png for best results.

Again, we see code that centers the content and a label immediately following the caption. `\begin{figure}[ht]` indicates that the figure should go "here" (at that point in the code) or at the "top" of a page. Sometimes LaTeX won't put figures right where you want them, sometimes for good reason. Other placement options can be found readily with a little searching. Also, note that the command `\includegraphics` includes both instructions about where to find the image and how large it should be in the document. Specifying the image size requires the `graphicx` package. While it is a built-in package, you can see in the preamble that we still had to tell LaTeX to use it.

### 1.4.3 A Note on Special Characters

As you've already seen, there are some characters that LaTeX treats specially. Examples include the % symbol (for comments), the & symbol (for tables) and the _ and $ symbols (used in mathematical notation). If you want to use one of these symbols in your text, you will have to "escape" it using the \ symbol. Other characters are a bit

trickier, such as \, which is generated using `$\backslash$`. The \ character is not only for escaping special characters but is also used at the beginning of LaTeX macros and commands. Numerous examples of this can be found by examining the `.tex` files that generated this document. Improper use of special characters will either result in their not appearing properly, unexpected formatting issues, or the document failing to compile. There are many resources available discussing these issues. As a final note, quotation marks are produced somewhat differently using the ` and ' characters for opening and closing quotes respectively. For example, "quotation" should be typed as ``` ``quotation'' ```, *not* as `"quotation"`. The latter yields "quotation", with improper quotes.

Additionally, you will find yourself having to do some additional work to create letters and symbols that you don't find on your keyboard. Unlike word processing software where special symbols and accented letters can usually be produced by a combination of key presses (e.g. Ctrl+something+something), in LaTeX these symbols are created by special character sequences beginning with \. The mathematical symbol for inequality, $\neq$, is produced with `$\neq$`, and accented characters like ö, ó, and ô are produced using `\"o, \'o,` and `\^o`.

### 1.4.4 Citations and Cross-References

The `natbib` package is included here for handling references and generating the bibliography. As with many other aspects of the document, you have choices and there are many other style files and you may prefer to use something else depending on formatting expectations for references (`apacite` is likely a popular alternative for some). Different packages have their own commands for handling references, so if you use something other than `natbib` you will have to attend to this, though the similarities will likely outweigh the differences. With `natbib`, you can use the `\cite` command to produce citations like [1], with just the year in parentheses, or the `\citep` command to produce citations like [3], with the parentheses enclosing both author and year. With parenthetical citations, you can also include text before or after the reference by using square brackets [for example 5, and others]. Multiple citations can be separated by commas, without spaces [2, 6]. When using the non-parenthetical `\cite` command, references will still appear in parentheses if the authors' names are different.

References to examples, figures, tables, sections, etc is accomplished via the `\ref` command, using the label you have included for the relevant item, as in Example (1), Table 1.1, or Section 1.4. You can additionally use the `\pageref` command to reference the page an item occurs on – for example Table 1.1 is on page 4.

### 1.5 Typesetting Your Document

If you're using a front end like MacTex, typesetting your document may be just as easy as clicking a button. If you're doing it directly from the command line (for example, Terminal in OSX), it is just slightly more involved. To produce a pdf of this document, with correct citations and cross-references, you type 4 commands:

```
pdflatex ut_thesis
bibtex ut_thesis
pdflatex ut_thesis
pdflatex ut_thesis
```

The first `pdflatex` command generates the document and information about the citations and cross-references it contains. The `bibtex` command gathers the necessary information from your `.bib` file, and the two final `pdflatex` commands then properly generate the bibliography and cross-referencing. If you haven't added any citations or cross-references, a single `pdflatex` may be all you need.

If you are a beginning user, you will likely opt for the easier route of doing your document preparation entirely with the tools supplied by your LaTeX distribution of choice, without needing to use the command line or other text editors. This is fine. The advantages of the alternative route are more applicable to more advanced users, and include the ability to generate other document formats besides pdf (such as .ps and .dvi), and the familiarity of using an editor one is already accustomed to. Ultimately, the choice is yours.

### 1.6 Summary

In this brief tutorial, we have covered a number of points. These include:

- The anatomy of a LaTeX project directory
- The structure of a .tex file, especially the preamble

- Numbered examples, tables, and figures
- Handling of special characters
- Citations and cross-references
- Typesetting

This is enough to get started producing fairly substantial documents, and one skill you will quickly gain is how to search for further information about how to accomplish more nuanced goals. There's lots more – for example, we never even touched on one of LaTeX's greatest strengths, which is the typesetting of mathematical formulas. There are also a great many packages to allow you to typeset different types of charts and graphs. These are all fairly straightforward though, and once you have them figured out, they are generally quite easy to use. Good luck!

# Chapter 2
# Background

This chapter was included just to have another chapter, nothing to see here.

The Latex typesetting markup language is specially suitable for documents that include mathematics.

# Appendix A
# Sample Appendix

This just exists to provide an example of an appendix

# Glossary

**latex** Is a mark up language specially suited for scientific documents. 10

**mathematics** Mathematics is what mathematicians do. 10

# Bibliography


[1] R. H. Baayen. *Analyzing Linguistic Data: A Practical Introduction to Statistics Using R*. Cambridge University Press, Cambridge, 2008.

[2] D.A. Cruse. Aspects of the micro-structure of word meanings. In Yael Ravin and Claudia Leacock, editors, *Polysemy: Theoretical and Computational Approaches*, pages 30–51. Oxford University Press, New York, 2000.

[3] Nicholas Gaylord. *The "resolution" of verb meaning in context*. PhD thesis, The University of Texas at Austin, 2013.

[4] Nancy J. Henley. A psychological study of the semantics of animal terms. *Journal of Verbal Learning and Verbal Behavior*, 8:176–184, 1969.

[5] Adam Kilgarriff. How dominant is the commonest sense of a word? In Sojka, Kopecek, and Pala, editors, *Proceedings of Text, Speech, Dialogue. Lecture Notes in Artificial Intelligence*, pages 103–112. Springer, 2004.

[6] Ekaterini Klepousniotou, Debra Titone, and Carolina Romero. Making sense of word senses: The comprehension of polysemy depends on sense overlap. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 34:1534–1543, 2008.

# Vita

This page is optional: if you do not include a Vita, delete this entire page. The vita is a brief biographical sketch of the writer that provides information for future readers. It should include the writer's full name and a permanent address or email address where the author can be reached. Because your dissertation will be available electronically, be aware that certain personal information could be used to steal your identity. For this reason, you are advised not to include your date of birth, parents' names, or children's names. The name of the typist should always appear at the end of the page

Permanent Address:

This dissertation was typeset with LaTeX $2_\varepsilon$[1] by the author.

[1] LaTeX $2_\varepsilon$ is an extension of LaTeX. LaTeX is a collection of macros for TeX. TeX is a trademark of the American Mathematical Society. The macros used in formatting this dissertation were written by Dinesh Das, Department of Computer Sciences, The University of Texas at Austin, and extended by Bert Kay, James A. Bednar, Ayman El-Khashab, and Nicholas Gaylord.