A Guide to LaTeX

Installation and Usage

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Introduction

1.1 About LeLaTeX

LeLaTeX is the author's customize LaTeX classes and styles combined with some additional processing commands. It has been developed through the years to create a standardized way of generating documents.

While it is open-source and anyone is free to use it, the library was never intended as a general library; it was created for personal use. As such, it does not have extensive documentation. It also may change without notification or regards to backwards compatibility.

For most users, it may be most beneficial as a reference library or to select particular style files and customize them as needed.

1.2 About this Document

This document serves many purposes. They include:

- Provide installation instructions.
- Provide an example documented that can be used as a template.
- Provide a reference for the syntax used by the author.

While these are not topics that would typically be combined, they are all somewhat short. Therefore, the decision was made to combine them into a single document.

Installation

These instructions are based on *MiKTeX* for *Windows*. Support for *Linux* or other operating systems or LaTeX installations is not available.

2.1 Prerequisites

2.1.1 LaTeX

You can download a *Windows* version as part of the *MiKTeX* (www.miktex.org) project.

2.1.2 Ghostscript and Ghostview

Historically, it was required to install *Ghostscript* and *Ghostview* [4] in order to view **`.eps`** files and convert them to **`.pdf`**s. However, it seems this requirement has been rendered obsolete by advances in *MiKTeX*.

It still can be useful to install these packages to allow viewing of **`.eps`** files. *Ghostscript* and *Ghostview* can be downloaded at http://www.cs.wisc.edu/ ghost/.

2.1.3 *WinEdt*

A useful interface to LaTeX/*MiKTeX* is provided by *WinEdt* (www.winedt.com). *WinEdt* is highly customizable. User interface features can be added to work with LeLaTeX. For more information see the *Installation Notes* in the repository https://github.com/lendres/WinEdt-Customizations.

2.2 LeLaTeX

To completely install LeLaTeX takes several steps. In the images that follow, **`C:\Custom Program Files\LaTeX`** is the folder the LeLaTeX library was downloaded to.

1 Download the library from https://github.com/lendres/LaTeX or your forked repository.

2 Add LeLaTeX as a TEXMF directory.
   - 2.1 Open the *MiKTeX* Console.
   - 2.2 Go to *Settings*→*Directories*
   - 2.3 Add the directory to as a TEXMF directory in the *MiKTeX* Console (see Figure 2.1).
   - 2.4 Run **`Tasks`**→**`Refresh file name database`**.
   - 2.5 Close the *MiKTeX* Console.

3 Add the **`Processing Support`** directory to the **`Path`** environmental variable.
   - 3.1 Open Windows System properties.
   - 3.2 Go to *Advanced*→*Environmental Variables* to open the environmental variables dialog box (see Figure 2.2). You may need admin rights to edit the environmental variables.
   - 3.3 Edit the environmental variables and add the **`./Processing Support`** directory to the **`Path`** variable.

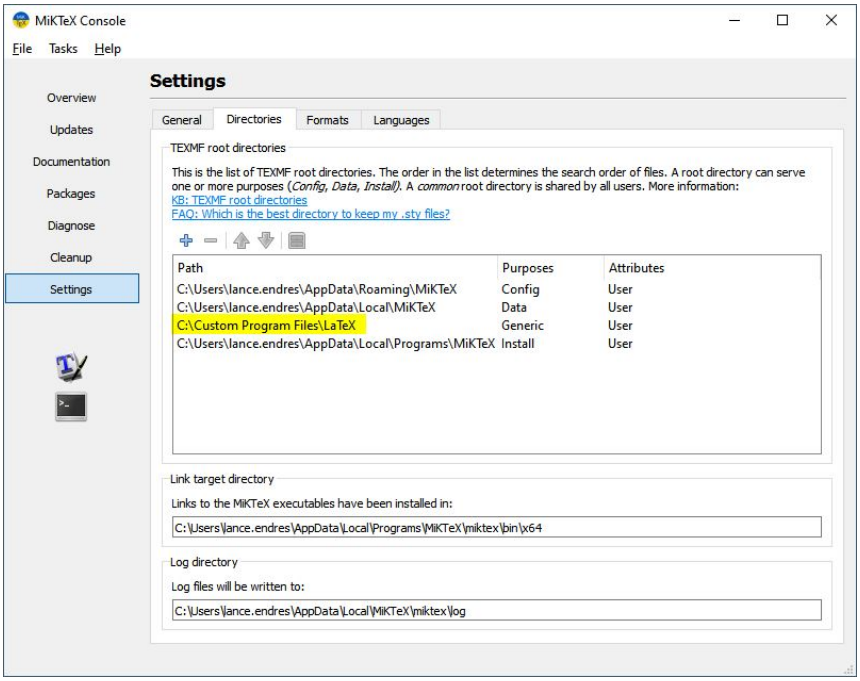

Figure 2.1: Adding the library as a TEXMF root directory.

4 Install *Strawberry Perl*

4.1 Download the installer from https://strawberryperl.com/.

4.2 Run the installer. Currently, *Strawberry Perl* needs to be installed in a path that does ***not*** contain spaces. However, it does not have to be the default directory.

5 Restart the computer.

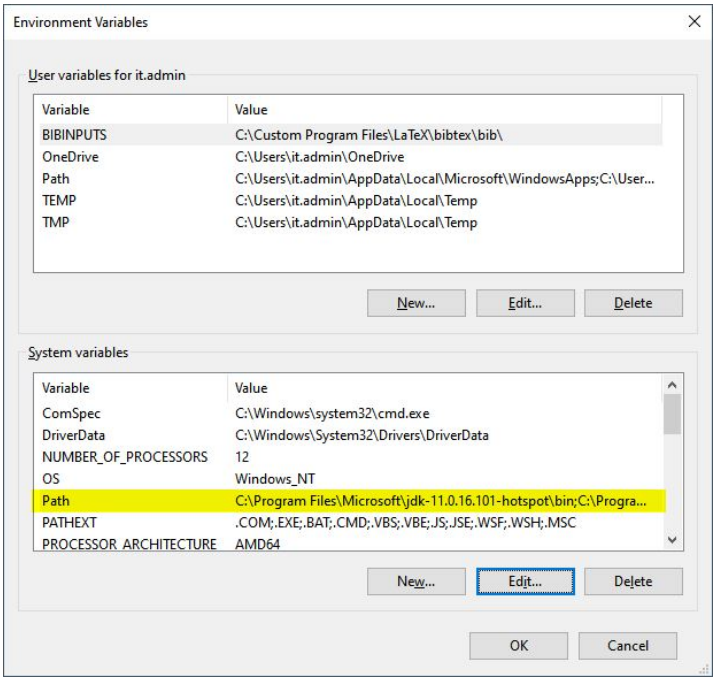

Figure 2.2: The environmental variable dialog box.

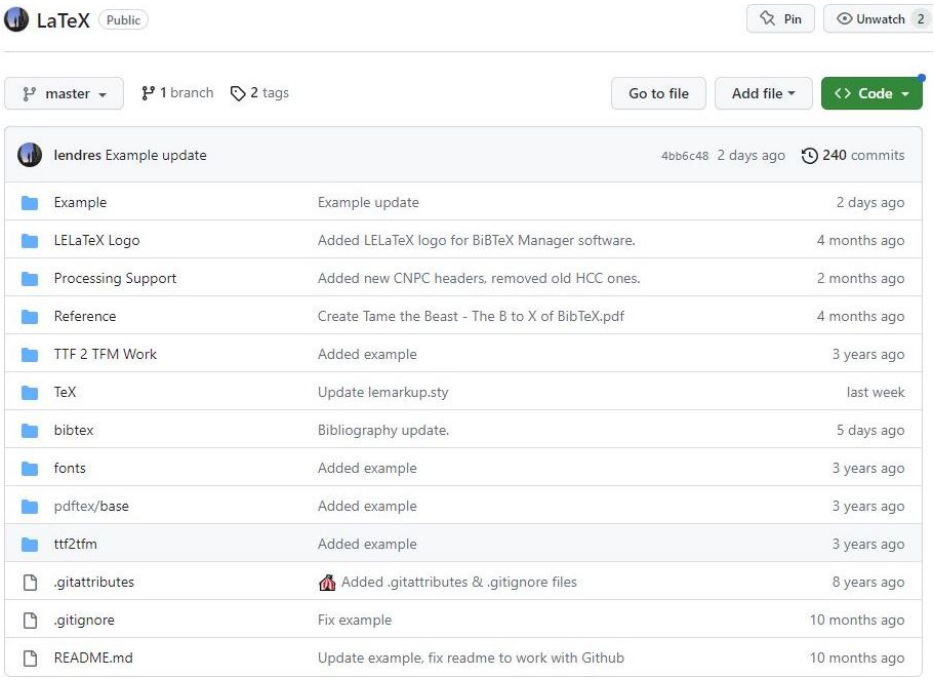

Figure 2.3: Github website root directory for LeLaTeX.

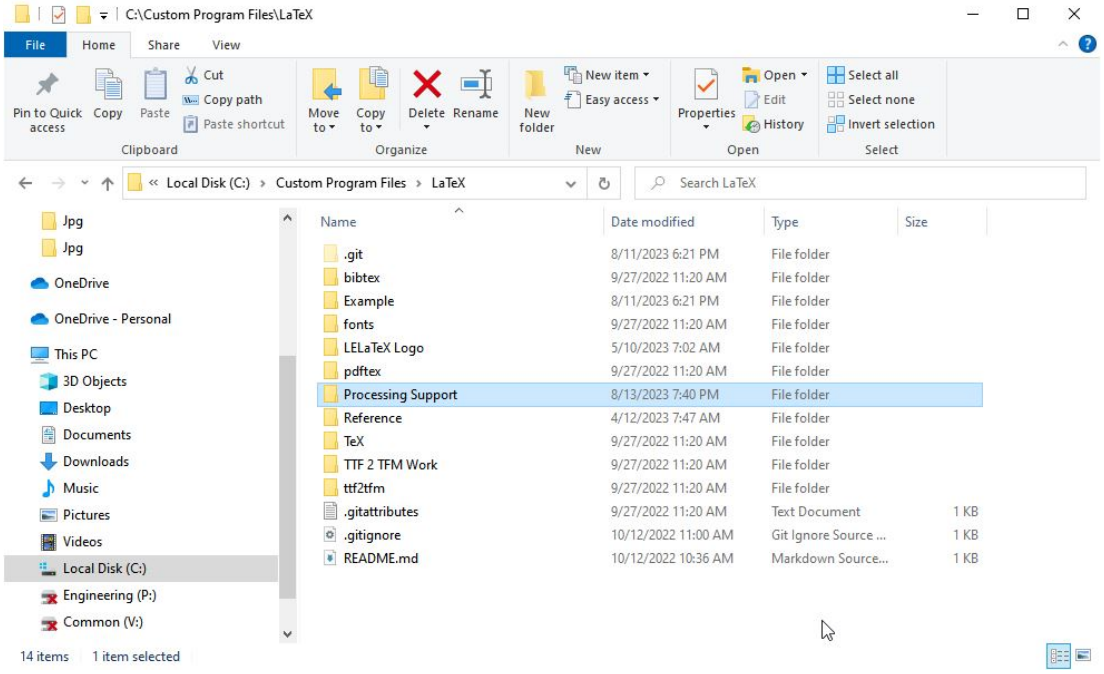

Figure 2.4: Local installation root directory for LeLaTeX.

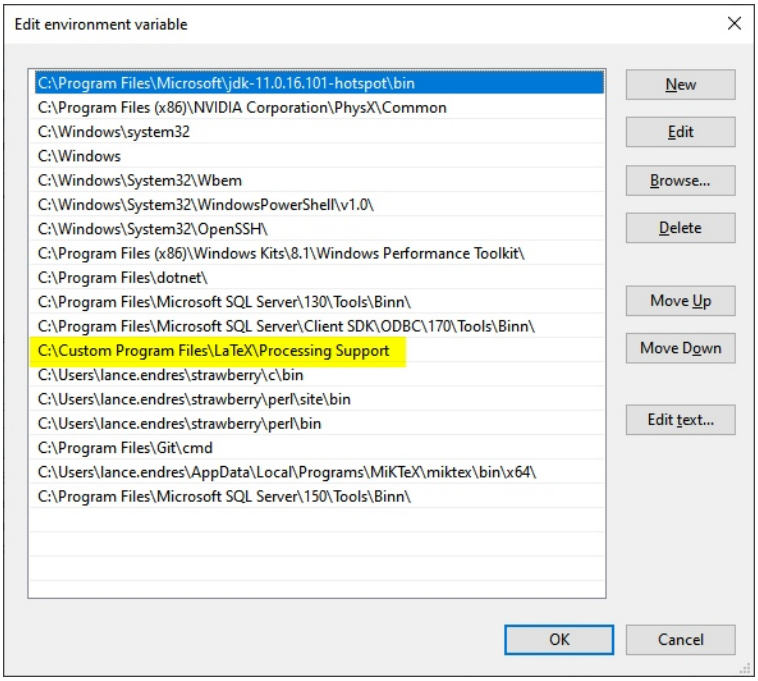

Figure 2.5: *Path* environmental variable with the *Processing Support Directory* installed.

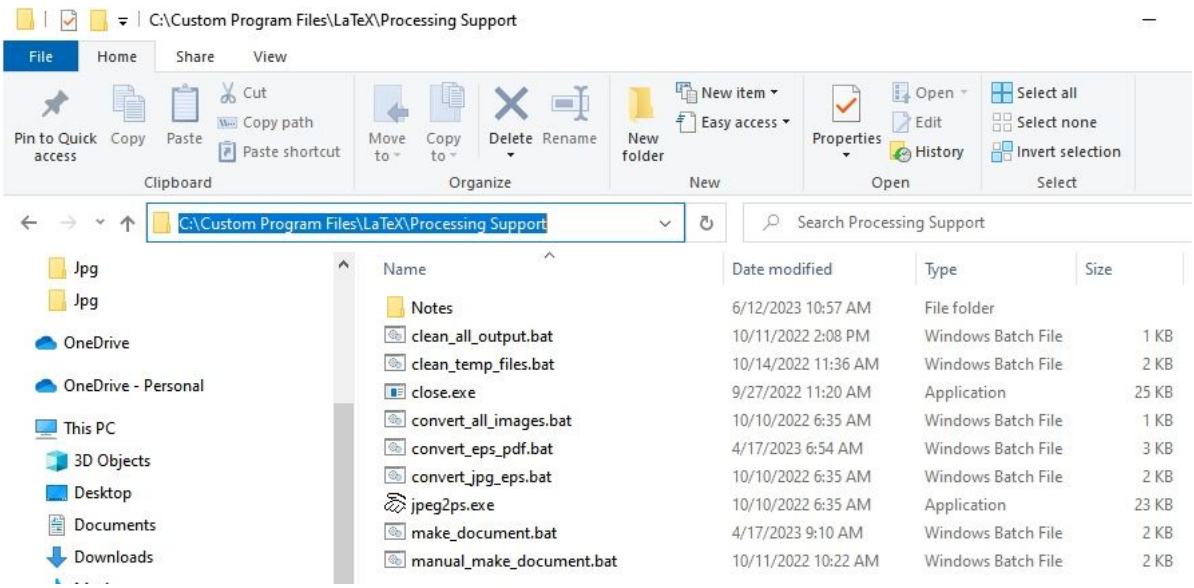

Figure 2.6: The location of the *Processing Support Directory*.

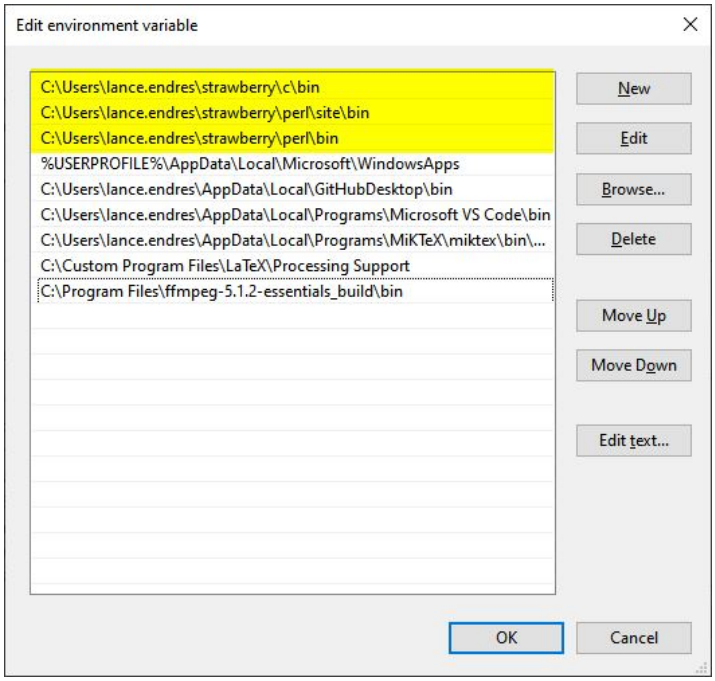

Figure 2.7: The *Strawberry Perl* paths installed to the *Path* environmental variable. These paths should be automatically installed from the *Strawberry Perl* installer.

Working with LeLaTeX

3.1 Graphics

LeLaTeX has been set up to produce both **.dvi** and **.pdf** formats as output.

3.1.1 Historical Use

There are a few issues that are associated with using graphics with both **.dvi** and **.pdf** files. The graphics used to generate the **.pdf** format must be in either **.pdf** or **.jpg** format. Some figures are of the **.eps** format (they are small, in vector format, and work well with LaTeX) and as a result need to be converted to work in the **.pdf** output file. Versions of the **.eps** files in **.pdf** format can be created the batch file

manual_convert_all_images.bat

located in the same directory as the figures. See the batch file itself for more details.

You can add figures in either JPG or EPS format.

1. Add the figure in the appropriate folder.

   .\Figures\Image Sources\Eps

   .\Figures\Image Sources\Jpg

2. Then run **.\Figures\Image Sources\manual_convert_all_images.bat**.

3.1.2 Current Use

Advances in either LaTeX and/or *MiKTeX* seem to have rendered the manual file conversion obsolete. You can simply places them in the folder

.\Figures

and they will automatically converted if it is required.

3.2 Notes on Running

3.2.1 Compiling

- To compile use **run_manual_make_document.bat**.

3.3 Batch Files

The "Processing Support" directory contains a series of files to help with processing LaTeX files. It provides a few features that are not provided by WinEdt. Mostly it works like "Texify" but allows for glossary support. It also allows for additional customization like opening or closing files.

These support files are designed to work with WinEdt or stand alone. To use with WinEdt, custom buttons or menu items are needed. See the "Custom Program Files\WinEdt" directory for information about how to do this.

To use, copy the project files (found in the "Examples" directory) into the document working directory (with the LaTeX files).

A short description of the files is below. Additional comments and instructions can be found inside the individual files.

File in this directory: - makedocument.bat Main processing file. The root file name and additional arguments are passed to this file.

- clean*.bat Clean up batch files used to delete temporary and output files.

- close.exe A small app that can close a Window (running software application) based on its name in the title bar. Useful for forcing Adobe Reader to close, for example.

Project files: - runmakedocument.bat A small batch file used to call "makedocument.bat" with the specific arguments required for a specific document. Used by WinEdt. WinEdt passes the document name to this file. That is passed along with the additional arguments to "makedocument." This file must be edited to set the additional arguments.

- manualakedocument.bat A small batch file used to manually call "makedocument.bat." It passes the file name to "runmakedocument.bat." This file has an option automatically detect the main LaTeX file. To work, the LaTeX file must have the same root file name as WinEdt project. If the file name is different, this file must be edited to manually enter the file name. Technically, this file can actually be called anything as it is not externally referenced.

Style and Syntax

Introduction text.

4.1 Fonts

The class file `lebook.cls` which contains common formatting.

Arial font test.

`Courier New font test.`

`Courier New Bold font test.`

Times New Roman font test.

Times New Roman Bold font test.

Bauh Heavy font test.

4.2 Prefixes

Prefix	LaTeX Element
ch	chapter
sec	section, subsection
ap	appendix
eq	equation
fig	figure
tab	table

Table 4.1: Prefixes used for different types of LaTeX elements.

LaTeX Examples

This section contains LaTeX examples. **Remove it before printing the final version.**

The source code for these examples is in the *LaTeX Examples.tex* file. Its inclusion into the final document is controlled in the *Model Comparison Report.tex* file.

5.1 Citations

This is a citation example \referencename~\cite{ref:aarsnes2017a}. Reference [1]

You can add a reference to the bibliography without directly citing it in text by using the command \nocite, e.g., \nocite{ref:abbassian1998a}.

5.2 Built in Name Commands

- Appendix (\appendixname)
- Chapter (\chaptername)
- Equation (\equationname)
- Figure (\figurename)
- Reference (\referencename)
- Section (\sectionname)
- Table (\tablename)

5.3 Figures

The Figure 5.1 shows the CNPC logo. Note, don't add the end of sentence period for the short title in the caption (part between the []).

5.4 Lists

- The first bullet point.
  - Lists can include other lists.

    A list with no markers.
- The second bullet point.
  1. Item 1.
  2. Item 2.

Figure 5.1: Longer title. This is descriptive and can be multiple sentences.

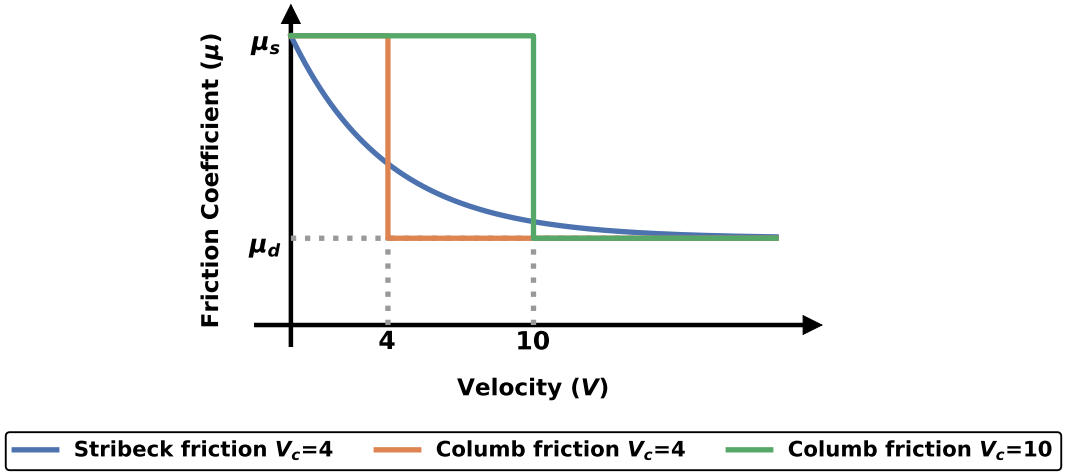

Figure 5.2: An example EPS image used as a figure.

5.5 MATH

The (fake) calculation can be done using Equation 5.1

$$\alpha = 2\beta \sum \left(\frac{\gamma}{\sigma} \right) \tag{5.1}$$

where

α = the first variable;
β = the second variable;
γ = the third variable;
σ = the final variable.

This example demonstrates specially written **mathwhere** environment define the variables. The **mathwhere** environment uses an optional argument to specify where the equal sign is placed. See the source code for more information. The environment takes the form of

```
\begin{mathwhere}[distance]
  \mathdefitem{math}{definition}
\end{mathwhere}
```

where

distance = the space allowed for the item being defined (location of the equal sign);
math = a variable to define;
definition = the definition of the variable.

5.6 Code

```
#pragma message("// TO DO")
  new Triangle();
```

5.7 Special Commands

Leave a note to finish a section later.

Other commands include the following.

- ***important***
- **warning**
- \note{...} (doesn't print the argument)

Bibliography

[1] Ulf Jakob Aarsnes and Roman Shor. Torsional vibrations with bit off bottom: Modeling, characterization and field data validation. *Journal of Petroleum Science and Engineering*, 163, November 2017.

[2] Leendert Ammeraal. *C++ for Programmers*. John Wiley & Sons, third edition, 2000.

[3] John R. Hubbard. *Schaum's Outlines Programming with C++*. McGraw Hill, second edition, 2000.

[4] Helmut Kopka and Patrick W. Daly. *A Guide to LaTeX*. Addison-Wesley, third edition, 1999.

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