

# Docs - L<sup>A</sup>T<sub>E</sub>X helpers

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## 1 Introduction

This set of L<sup>A</sup>T<sub>E</sub>X files is designed to give you a good looking, pre-configured L<sup>A</sup>T<sub>E</sub>X setup, which helps you get started much more quickly.

It has some configuration options already, but more are to come soon. If you have any suggestions as to what should be added, don't hesitate to open a support ticket at <https://support.janishutz.com?a=add> or contacting me via email to [development@janishutz.com](mailto:development@janishutz.com).

**Breaking Changes**: The timecomplexity commands have been updated to require math environment. You can use the following regex to fix them: `:%s/ \\tc\([olt]\)\ (execute first) and :%s/\\text{\\tc\([olt]\)\{(.*)\}}/\\tc\1{2}/g`

## 2 Installation

You can install these helper files by downloading this repo and storing it to any location on your PC, remembering where that location is.

You may also install the VSCode snippets found in the `vscode-snippets` folder. These snippets provide autocompletion for many of the commands that this helper file provides.

### 3 Usage

You can type `latex-prepare` and press tab, if you have installed the VSCode snippets, or copy over this code snippet:

```
\documentclass{article}

\newcommand{\dir}{~/path/to/helper} % TODO: Change your path here! No trailing slashes!
\input{\dir/include.tex}
\load{recommended} % TODO: Change the inclusion level (if necessary), see below

\setup{Type your title here}

\begin{document}
\startDocument
```

Type your `\LaTeX` here

```
\end{document}
```

The `\load` command takes one parameter, which can be one of the following:

- `minimal` Just the core styling and core functionality.
- `most` Includes Math, CS, Language and all styling.
- `recommended` The recommended setup. Includes BibTeX in addition to what is in `most`
- `all` If you want to also include glossaries or code with highlighting
- `letter` If you want to typeset a letter (see 3.2)

#### 3.1 Configuration

You can set a global config in config file in helper files directory. The file is located at

`/<path to helpers>/config/config.tex`. All configs are documented there. Simply open that file using any text editor and edit your config.

#### 3.2 Letters

Letters require a different setup compared to a normal L<sup>A</sup>T<sub>E</sub>X document:

```
\documentclass[12pt,a4paper]{scr1ltr2}

\newcommand{\dir}{~/path/to/helper} % TODO: Change your path here! No trailing slashes!
\input{\dir/include.tex}
\load{letter}

\setkomavar{subject}{} % type your subject here
\begin{document}\raggedright
  % below, type the address, being careful not to remove the backslashes
  \begin{letter}{Company \\ Name \\ Address \\ CH-Place}
    \opening{Intro}

    Your text

    \closing{Kind regards} % Your closing sentence
  \end{letter}
\end{document}
```

If you are using the snippets, you can type `latex-letter` and press tab.

## 4 Custom Loader

You can create a custom loader by defining a `load{string}` macro (or any other, if you are aware you need to change that in your main file for it to work) that uses the `\dir` command to resolve the custom parts. Take a look at the `/include.tex` file for inspiration on how to do it, if you also want it to do case distinction.

You can also include some the pre-built configs from the `dist/` folder.

## 5 Full Command Reference

### 5.1 Variables

- *scope*: minimal, most, recommended, all or letter
- *string*: Any normal text
- *math*: Any math input
- *number*: Any non-negative integer, i.e. no commas
- *color*: Any of the dvipsnames colours of xcolor
- *language*: 2-character country code (currently only `de` and `en` supported)

### 5.2 Per-File config

- `\renewcommand{\authorTitle}{string}` Change the author (in the title) for this document only
- `\renewcommand{\authorHeaders}{string}` Change the author (in the header) for this document only
- `\renewcommand{\name}{string}` Change the name (for letters) for this document only
- `\renewcommand{\street}{string}` Change the street (for letters) for this document only
- `\renewcommand{\city}{string}` Change the city (for letters) for this document only
- `\renewcommand{\countrycode}{string}` Change the country-code (for letters) for this document only
- `\renewcommand{\theoremde}{string}` Change the translation for theorem in German (usually either “Satz” or “Theorem”)
- `\setcounter{numberingConfig}{number}` Change the numbering of definitions, lemmas, etc for this document. 0 = off, 1 = Separately, 2 = Combined (except for definition), 3 = Combined
- `\setcounter{numberSubsections}{number}` Change the format of the numbering of definition, lemma, etc.
  - 0 = <section>.<number>,
  - 1 = <section>.<subsection>.<number>,
  - 2 = <section>.<subsection>.<subsubsection>.<number>
 Changing this won't affect all of numbering prior to the command, only after. You can change this setting (and the one above) at any point in the document
- `\setcounter{descriptorShadeStrength}{number}` Change the colour saturation of the inline descriptors
- `\setcounter{shadeStrength}{number}` Change the colour saturation of the `\shade` command
- `\setLang{language}` Change the language. Will automatically load babel in German. Can only be used once and only at the start of the document or in the preamble, as repeated usage leads to undefined behaviour
- To change the font for the entire document, load the font package using `\usepackage`, with the last occurrence of a font package determining the active one. Then select the type by using `\setFontType{mono | serif | sans}`. A list of fonts is available [here](#). You may change the font only for a specific section, by enclosing `\setFont` and the text that should be written in said typeface in curly braces.

### 5.3 Setup, Loading & Translation

- `\load{scope}` Load the selected *scope*
- `\setup{string}` Prepare the document with the *string* being the title
- `\setupCheatSheet{string}` Prepare the document with smaller borders and no headers / footers. *string* is the title
- `\setupBarebones{string}` Minimal setup, only borders and title set
- `\startDocument` Initialize the document. Has to be called after `\begin{document}`
- `\usetcolorboxes` Initialize tcolorboxes. In main body, if you want to use fancy boxes. (requires `most` or up)
- `\translate{string}{string}` First *string* is English, second *string* is German. Switches automatically based on language selected
- `\tr{string}{string}` Shorthand for `\translate`

## 5.4 Math-Commands

All these have to be executed in the math environment.

- `\R` Prints  $\mathbb{R}$ . Same goes for `\C` printing  $\mathbb{C}$ , etc.
- `\floor{math}` Round down symbol, e.g.  $\lfloor n \rfloor$
- `\ceil{math}` Round up symbol, e.g.  $\lceil n \rceil$
- `\hastoeq` or `\mbeq` Has to equal symbol (non-standard),  $\stackrel{!}{=}$
- `\Leftrightarrow` Equivalence transformation symbol,  $\Leftrightarrow$ .
- `\Rrightarrow` Equivalence transformation symbol,  $\Rrightarrow$ .
- `\Leftarrow` Equivalence transformation symbol,  $\Leftarrow$ .
- `\defAs` Define as, i.e.  $\stackrel{\text{def}}{=}$
- `\defEquiv` Define as, but with a two-sided implication instead of equality, i.e.  $\stackrel{\text{def}}{\Leftrightarrow}$
- `\defImplies` Define as, but with one-sided implication, i.e.  $\stackrel{\text{def}}{\Rightarrow}$
- `\divides` Divider or divides symbol, e.g.  $a \mid b$
- `\lcm` Least common multiple, `lcm`
- `\arcsinh` Inverse of hyperbolic sine, `arcsinh`
- `\arccosh` Inverse of hyperbolic cosine, `arccosh`
- `\arctanh` Inverse of hyperbolic tangent, `arctanh`
- `\limit{math}{math}` Shortened limit notation,  $\lim_{x \rightarrow x_0}$
- `\limni` Shortened limit notation for  $n \rightarrow \infty$ ,  $\lim_{n \rightarrow \infty}$
- `\liminfni` Shortened limit inferior notation for  $n \rightarrow \infty$ ,  $\liminf_{n \rightarrow \infty}$
- `\limsupni` Shortened limit superior notation for  $n \rightarrow \infty$ ,  $\limsup_{n \rightarrow \infty}$
- `\der{math}` Derivative,  $\frac{d}{dx}$
- `\dern{math}{math}` Higher derivative,  $\frac{d^2}{d^2x}$



## 5.5 CS-Commands

These commands have to be executed inside math environment, except `\timecomplexity` and `\tc`.

- `\timecomplexity` Prints the word time complexity with a coloured box.
- `\tc` Shorthand for `\tct`. Deprecated
- `\tct` Time complexity in  $\Theta()$ -notation (average case)
- `\tco` Time complexity in  $\mathcal{O}()$ -notation (worst case / upper bound)
- `\tcl` Time complexity in  $\Omega()$ -notation (best case / lower bound)
- `\t[R, C, N]` Simply prints a capital R, C or N in math mode as normal text. So e.g. use R to print an R
- `\wordbool` Prints  $(\Sigma_{\text{bool}})^*$
- `\words{string}` Prints  $(\Sigma_{\text{test}})^*$
- `\wordm{math}` Prints  $\Sigma_1^*$
- `\word` Prints  $(\Sigma)^*$
- `\alphabets{string}` Prints  $\Sigma_{\text{test}}$
- `\alphabetbool` Prints  $\Sigma_{\text{bool}}$

### Algorithms

```
\begin{algo}{functionName(A)}
  \Procedure{functionName}{$(A)$}
    \State\Return "Hello World"
  \EndProcedure
\end{algo}
```

---

**Algorithm 1** FUNCTIONNAME(A)

---

```
1 procedure FUNCTIONNAME((A))
2   return "Hello World"
```

---

## 5.6 Style

General styling commands. All other commands, except these ones require at least `most` to be the selected *scope*

- `\TODO` Print a highlighted **TODO:**
- `\background{color}{number}{string}` Print **shaded text, with colour saturation**
- `\shade{color}{string}` Print **shaded text**
- `\backdrop{string}` Print **text with gray backdrop**
- `\fhlc{color}{string}` Print **bold, underlined text in a coloured box**
- `\fhl{string}` Print **bold, underlined text in a white box**
- `\printtoc{color}` Print the table of contents (as seen on the first page). The normal `\tableofcontents` still works as expected
- `\smallhspace` Prints a 2mm hspace
- `\mediumhspace` Prints a 5mm hspace
- `\largehspace` Prints a 10mm = 1cm hspace
- `\rmvspace` Removes some of the vertical whitespace printed by environments like `align`

### 5.6.1 Tcolorboxes

Included in most and up

Put `\usetcolorboxes` right after `\startDocument` (right after `\begin{document}`) if you plan to use them.

#### General

Title here

Terms

```
\begin{terms}[] {Title here}
\end{terms}
```

Title here

Notation

```
\begin{notation}[] {Title here}
\end{notation}
```

Title here

Recall

```
\begin{recall}[] {Title here}
\end{recall}
```

Title here

Remarks

```
\begin{remarks}[] {Title here}
\end{remarks}
```

Title here

Usage

```
\begin{usage}[] {Title here}
\end{usage}
```

Title here

Tutorial

```
\begin{guides}[] {Title here}{Tutorial}
  % You can also change the right title on this one
\end{guides}
```

Title here

Properties

```
\begin{properties}[] {Title here}
\end{properties}
```

Title here

Restrictions

```
\begin{restrictions}[] {Title here}
\end{restrictions}
```

**Title here****Limitations**

```
\begin{limitations}[] {Title here}
\end{limitations}
```

**Math-Specific****Title here****Formula 5.1**

```
\begin{formula}[] {Title here}
\end{formula}
```

**Counter-enabled**

These ones also have two settings, namely, you can change the counter behaviour and the inclusion of subsections in the numbering. See 5.2.

See 5.6.3 for a guide on how to change the current number.

**Title here****Definition 5.1**

```
\begin{definition}[] {Title here}
\end{definition}
```

**Title here****Theorem 5.1**

```
\begin{theorem}[] {Title here}
\end{theorem}
```

**Title here****Lemma 5.1**

```
\begin{lemma}[] {Title here}
\end{lemma}
```

**Title here****Corollary 5.1**

```
\begin{corollary}[] {Title here}
\end{corollary}
```

**Title here****Proposition 5.1**

```
\begin{proposition}[] {Title here}
\end{proposition}
```

**Title here****Fact 5.1**

```
\begin{fact}[] {Title here}
\end{fact}
```

**Title here****Axiom 5.1**

```
\begin{axiom}[] {Title here}
\end{axiom}
```

**Title here****Example 5.1**

```
\begin{example}[] {Title here}
\end{example}
```

**Title here****Remark 5.1**

```
\begin{remark}[] {Title here}
\end{remark}
```

**Language-Specific****Title here****Conjugation**

```
\begin{conjugation}[] {Title here}
\end{conjugation}
```

**Title here****Forms**

```
\begin{forms}[] {Title here}
\end{forms}
```

**CS-Specific** *Coming soon!***Flexible****title****second title**

This Tcolorbox is flexible and can take any main and secondary title, as well as any colour.

```
\begin{general}[] {title}{second title}{red}
\end{general}
```

## 5.6.2 Inline & Shortened descriptors

*Included in most and up*

See 5.6.3 for a guide on how to change the current number.

### Inline

Command	Output
<code>\inlineex</code>	<b>Example 5.2:</b>
<code>\inlinedef</code>	<b>Definition 5.2:</b>
<code>\inlinetheorem</code>	<b>Theorem 5.2:</b>
<code>\inlinelemma</code>	<b>Lemma 5.2:</b>
<code>\inlinecorollary</code>	<b>Corollary 5.2:</b>
<code>\inlineproposition</code>	<b>Proposition 5.2:</b>
<code>\inlinefact</code>	<b>Fact 5.2:</b>
<code>\inlineaxiom</code>	<b>Axiom 5.2:</b>
<code>\inlineremark</code>	<b>Remark 5.2:</b>
<code>\inlineproof</code>	<b>Proof:</b>

### Shortened

Command	Output
<code>\shortex</code>	<b>Ex 5.3:</b>
<code>\shortdef</code>	<b>D 5.3:</b>
<code>\shorttheorem</code>	<b>T 5.3:</b>
<code>\shortlemma</code>	<b>L 5.3:</b>
<code>\shortcorollary</code>	<b>C 5.3:</b>
<code>\shortproposition</code>	<b>P 5.3:</b>
<code>\shortfact</code>	<b>F 5.3:</b>
<code>\shortaxiom</code>	<b>A 5.3:</b>
<code>\shortremark</code>	<b>R 5.3:</b>
<code>\shortproof</code>	<b>Proof:</b>

**Inline (Named)**

Command	Output
<code>\fancyex{string}</code>	<b>Example 5.4:</b> ( <i>Exercise</i> )
<code>\fancydef{string}</code>	<b>Definition 5.4:</b> ( <i>Definition</i> )
<code>\fancytheorem{string}</code>	<b>Theorem 5.4:</b> ( <i>Theorem</i> )
<code>\fancylemma{string}</code>	<b>Lemma 5.4:</b> ( <i>Lemma</i> )
<code>\fancycorollary{string}</code>	<b>Corollary 5.4:</b> ( <i>Corollary</i> )
<code>\fancyproposition{string}</code>	<b>Proposition 5.4:</b> ( <i>Proposition</i> )
<code>\fancyfact{string}</code>	<b>Fact 5.4:</b> ( <i>Fact</i> )
<code>\fancyaxiom{string}</code>	<b>Axiom 5.4:</b> ( <i>Axiom</i> )
<code>\fancyremark{string}</code>	<b>Remark 5.4:</b> ( <i>Remark</i> )
<code>\fancyproof{string}</code>	<b>Proof:</b> ( <i>Proof</i> )

**Shortened (Named)**

Command	Output
<code>\compactex{string}</code>	<b>Ex 5.5:</b> ( <i>Exercise</i> )
<code>\compactdef{string}</code>	<b>D 5.5:</b> ( <i>Definition</i> )
<code>\compacttheorem{string}</code>	<b>T 5.5:</b> ( <i>Theorem</i> )
<code>\compactlemma{string}</code>	<b>L 5.5:</b> ( <i>Lemma</i> )
<code>\compactcorollary{string}</code>	<b>C 5.5:</b> ( <i>Corollary</i> )
<code>\compactproposition{string}</code>	<b>P 5.5:</b> ( <i>Proposition</i> )
<code>\compactfact{string}</code>	<b>F 5.5:</b> ( <i>Fact</i> )
<code>\compactaxiom{string}</code>	<b>A 5.5:</b> ( <i>Axiom</i> )
<code>\compactremark{string}</code>	<b>R 5.5:</b> ( <i>Remark</i> )
<code>\compactproof{string}</code>	<b>Proof:</b> ( <i>Proof</i> )

**5.6.3 Changing the counters**

*Included in most and up*

You may set the current number for the elements by setting their corresponding counter to the selected number. You can do this using `\setcounter{name of the counter}{number}`, where you replace *name of the counter* with one of the following: `definitions`, `lemmas`, `theorems`, `corollaries`, `propositions`, `facts`, `axioms`, `examples`, `remarks`

This only applies if you have set `numberingConfig` to 1 (for all of them) and 2 (only for `definitions`). To change the combined numbering, set `all` to your desired number.



## 5.7 Tables

*Included in most and up*

You can set up nice looking tables using the `booktab` and `tabulary` environments.

```
\begin{tables}{ll}{Left & Right}
  Left content & Right Content\\
\end{tables}
```

This outputs as

Left	Right
Left content	Right Content

This doesn't use the `table` environment, so no captions are possible, as to why there is also

```
\begin{fullTable}{ll}{Left & Right}{This is a caption}
  Left content & Right Content\\
\end{fullTable}
```

This outputs as

Left	Right
Left content	Right Content

Table 1: This is a caption

## 5.8 Index

*Included in most and up*

If you want to use index, add `\prepareIndex` to the preamble. Using `\addIndexBold{string}`, you can add entries to the index. They are printed in bold typeface in your document. Using `\addIndex{string}`, you can do the same, but the text remains normal and using `\addIndexItalic{string}`, it is printed in italics

## 5.9 Extras

### 5.9.1 BibTeX

*Included in recommended and up*

Use `\setupBiber{/path/to/your/bib/sources.bib file}` in the preamble to prepare, then use `\printbib` to print your bibliography.

To add more sources, simply use biber's built-in macro `\addbibresource{filepath}`, which will load your `.bib` file. You need to use that inside the preamble as well.

### 5.9.2 Glossary

*Included in recommended and up*

Use `\setupGlossary` in the preamble to prepare, then use the normal glossary commands to add entries to the glossary. When you want to print it, use `\printGlossary`.

### 5.9.3 Minted

*Included in full*

Be sure to enable `shell-escape` for your compiler!

When `minted` is available via these helpers, you will also have access to the `codesnippet` macro:

```
\begin{code}{language}
  //Code goes here
\end{code}
```

This is nothing different than a wrapper for a `minted` environment with a box drawn around it.

Example (in python):

---

```
1 def hello_world():
2     print("hello world!")
```

---

If you want to print code inline, use `\inlinecode{string}`, which renders to `code`.

*Caveat: This is not using the `verbatim` environment due to various limitations of that environment and instead is simply using `\texttt{}`, so you cannot use this to print L<sup>A</sup>T<sub>E</sub>X-commands*

## 6 Troubleshooting

### 6.1 Visual Errors

#### 6.1.1 Missing headers & footers

You have most likely forgotten about `\startDocument` after `\begin{document}`, or you are using `\setupbarebones` or `\setupexams`.

You can easily distinguish from simply looking at the PDF. If the title is missing too, it's the first one, if it is there, it is most likely the second.

#### 6.1.2 Right box of guides `tcolorbox` is a weird title

You have most likely forgotten about the second argument. Then, the first letter is removed from the body and used as the title.

### 6.2 `pgfkeys`: Don't know `mainboxstyle`

You have most likely forgotten about `\usetcolorboxes` after `\startDocument`.

### 6.3 Undefined commands

You have most likely loaded a too small *scope*

### 6.4 Lots of errors and no compile

You have most likely selected a non-existent *scope* in the `\load` function. You can verify by searching the `<document name>.log` file for any mention of `INVALID CONFIG SPECIFIED, NOTHING LOADED!`

### 6.5 Minted

`minted` is a syntax highlighting library. It can cause issues when running, as it needs extra configuration for the compiler.

#### 6.5.1 You must invoke LaTeX with the `-shell-escape` flag

You have set the *scope* to `full`, which loads the `minted` package for code highlighting. You will need to configure your latex compiler to use `-shell-escape` if you want to use it. If you do not plan to use it, simply switch to a smaller *scope*.

#### 6.5.2 You must have `pygmentize` installed

Your host system is lacking the `pygmentize` package or you have not added the `pip` path to your `$PATH`. This is also the reason as to why the `-shell-escape` flag has to be set, as `minted` needs to access external libraries (namely `pygmentize`) to do the syntax highlighting.

### 6.6 Any other error

Ensure that you are not missing any closing brackets or a math environment is still open. If nothing helps, contact support at <https://support.janishutz.com>