Thesis title

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Abstract

This document shows you the syntax to type your thesis in latex or org-mode. It illustrates how to make footnotes, tables, equations and references to tables, equations etc.

If you want to work with latex only, look at the underscore latex file of this document. If you want to use emacs org-mode, then use the `.org` file. The pdf shows what the file looks like if you export it.

Running python code in this file only works in emacs org-mode; not in latex.

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Contents

1 Introduction

This file shows you how to use emacs with latex to write a thesis; shows you how to cite references, make footnotes, equations etc.

In order to use emacs, you need to install it. In Appendix A we explain how emacs can be installed.

By default you are in "evil mode"; that is, modal editing.

- Use the h, j, k and l keys to move around
- if you want to type something, press the i key ("i" for insert)
- If you do not like modal editing, press M-x turn-off-evil-mode
- In emacs M-x means: press the alt-key and the x-key together

2 Literature references

There are a number of ways in which you can do literature citations in emacs. We will work with reftex:

- `https://www.gnu.org/software/auctex/reftex.html`
- to include a reference, type C-c [
- where in emacs C-c means: press the control-key and c-key together
- to get a TOC for your file: C-c =

The syntax for including references is as follows. See Farrell and Klemperer [2007] for an analysis. We can also have references between brackets [Athey and Imbens, 2019]: that is, `citep` instead of `citet`. `armstrong-2007-chapt-coord` is the bibtex key, as you can see in the file `references.bib`.

An entry in a bib-tex file looks as follows:

```
@Article{prager-2021-employ-consol-wages,
  author          = {Prager, Elena and Schmitt, Matt},
  title           = {Employer Consolidation and Wages: Evidence From Hospitals},
  journal         = {American Economic Review},
  volume          = 111,
  number          = 2,
  pages           = {397-427},
```

```
  year            = 2021,
  doi             = {10.1257/aer.20190690},
  url             = {http://dx.doi.org/10.1257/aer.20190690},
  issn            = {0002-8282},
  month           = {Feb},
  publisher       = {American Economic Association},
}
```

To cite this paper, we type

`\cite{prager-2021-employ-consol-wages}.`

to get Prager and Schmitt [2021].

As mentioned, if you use the `init.el` file for emacs, you can use the keys: C-c [(press control (Ctrl) and c together; release these keys and then press the [-key).

3 References to sections, equations, tables etc.

As we explained in Section 1. The previous sentence shows the syntax for a reference to a section, equation, table, figure etc. Type `ref:` and then the name of the label you are refering to. This can also be done with key strokes: C-c)

A label is typed in latex format as: `\label{name_of_label}`.

Here we have some in-line math: x^2.[1]

If you want to preview your latex, you can type: C-c C-p C-b (or use the Preview menu above).

As you can see in footnote 1; you can also refer to footnotes.

$$a^2 + b^2 = c^2 \tag{1}$$

As we show in equation (1).

See Table 1.

In org mode (not in latex) you can add spreadsheet type calculations to your tables. See `https://orgmode.org/worg/org-tutorials/org-spreadsheet-intro.html` if you want to know more about this.

In latex this table looks as follows:

[1] This is a footnote.

Table 1: This table shows unemployment and gdp per head.

country	unemployment	gdp
NL	0.06	20000
UK	0.01	19500
BE	0.08	21100
average	0.05	20200

```
\begin{table}[htbp]
\caption{\label{table1} This table shows unemployment and gdp per head.}
\centering
\begin{tabular}{lrr}
country & unemployment & gdp\\
\hline
NL & 0.06 & 20000\\
UK & 0.01 & 19500\\
BE & 0.08 & 21100\\
\hline
average & 0.05 & 20200\\
\end{tabular}
\end{table}
```

The following figure we can generate with python code in org-mode; not in latex (see the appendix using the data in Table 1).

See Figure 1 is the way you can refer to a figure.

4 What should your editor be able to do?

4.1 Basics

- type text...
  - consider whether you want to use modal editing
- work on different parts of the same file in a split window
- help with syntax, e.g. by providing snippets for equations, environments etc.

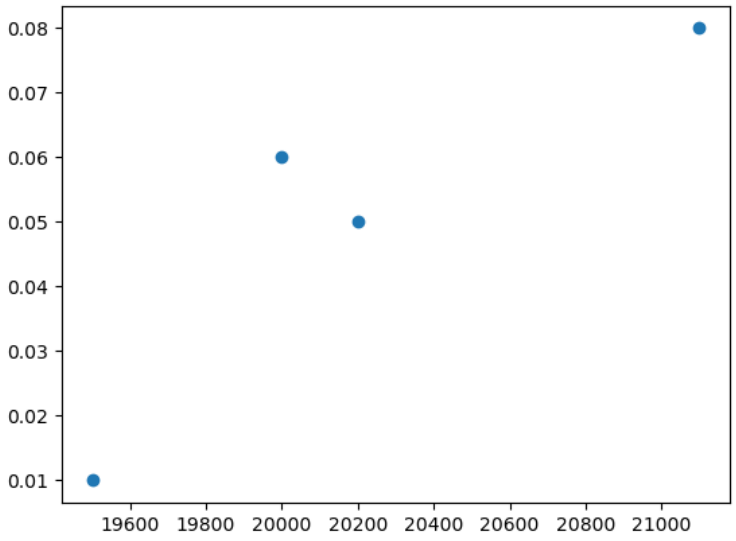

Figure 1: Figure with unemployment and gdp

  - e.g. with (org) cdlatex mode: type "equ" and then TAB to get an equation environment
  - ‘ a to get α

- operate on regions: e.g. for search and replace
- operate on columns:
  - delete columns in text
  - copy and past columns
  - add text in a column
- add references to equations, sections, tables, figures
- cite literature from a bibliography file
- make it easy to add tables and edit tables (e.g. switch rows)
- export to pdf
- export to html (possible with an org-file; not with latex file)

4.1.1 simple column operations

123456789 123456789 123456789 123456789 123456789 123456789 123456789 123456789

4.2 Advanced

- combine code and latex
- spreadsheet type capabilities

The derivative of the function $f(x) = x^2 + 3x + 10$ is $f(x) = x^2 + 3x + 10$

- put your cursor in the second equation $f(x) = ...$
- M-x calc-embedded
- press a and d
- give x as the variable and press Enter
- emacs gives you the derivative
- M-x calc-embedded (to get out of calc-mode)

4.2.1 column operations

Make the following lines, itemized in latex:

```
apples
oranges
bananas
```

- type begin itemize at the top
- use C-c] at the end
- C-v and block the start of each line
- I and type `\item` then press ESC

5 Conclusion

Here you can type the conclusion which is then followed by the bibliography.

6 Bibliography

References

Susan Athey and Guido W. Imbens. Machine learning methods that economists should know about. *Annual Review of Economics*, 11(1): 685–725, 2019. doi: 10.1146/annurev-economics-080217-053433. URL https://doi.org/10.1146/annurev-economics-080217-053433.

Joseph Farrell and Paul Klemperer. Chapter 31 coordination and lock-in: Competition with switching costs and network effects. volume 3 of *Handbook of Industrial Organization*, pages 1967 – 2072. Elsevier, 2007. doi: 10.1016/S1573-448X(06)03031-7. URL http://www.sciencedirect.com/science/article/pii/S1573448X06030317.

Elena Prager and Matt Schmitt. Employer consolidation and wages: Evidence from hospitals. *American Economic Review*, 111(2):397–427, Feb 2021. ISSN 0002-8282. doi: 10.1257/aer.20190690. URL http://dx.doi.org/10.1257/aer.20190690.

A Things to install

A.1 latex

Install latex: `https://www.latex-project.org/get/`

A.2 latex editors if you do not want to use emacs

- winedt: `https://www.winedt.com/`
- overleaf: `https://www.overleaf.com/`
- texmaker: `https://www.xm1math.net/texmaker/`
- tex studio: `https://www.texstudio.org/`

A.3 git

install git: `https://git-scm.com/downloads`

A.4 Emacs

In the lecture I will illustrate what an editor can/should do using emacs.

A.4.1 Emacs on Windows

- go to: `http://mirror.team-cymru.com/gnu/emacs/windows/emacs-27/`
- download `emacs-27.2-x86_64-installer.exe` to your Downloads folder: `http://mirror.team-cymru.com/gnu/emacs/windows/emacs-27/emacs-27.2-x86_64-installer.exe`
- run the downloaded `exe` file

A.4.2 Emacs on Mac OS

For Mac Os:

- install homebrew: `https://brew.sh/`

  Open a terminal and type the following lines:

```
brew tap d12frosted/emacs-plus
brew install emacs-plus
```

A.4.3 Emacs on Linux

When you are using Linux, you probably know what you are doing. But just in case, the commands for your package manager can be found here: `https://www.gnu.org/software/emacs/download.html`

A.4.4 org-mode

When you install emacs, org-mode is installed as well (comes with emacs)

A.5 introductions to emacs

It is easy to get lost in emacs. Hence do not try to use everything at once. A couple of basic things, you need from the start (like opening and saving files). For the other things: move step-by-step.

A great starting point, explaining key-bindings etc. is:

- `https://systemcrafters.net/emacs-essentials/absolute-beginners-guide-to-emacs/`
  - and the video that goes with it: `https://www.youtube.com/watch?v=48JlgiBpw_I`
  - this explains things like "M-x", "C-c", "C-x" etc. which you can see when you use menu items like "file"
    * to illustrate, use your mouse to click on "File" in the top left corner
    * the first item is: "Visit New File... C-x C-f"
    * you can click on this item to open a file; but you can also use the key combination C-x C-f which means: press Control (Ctrl) and x together; release these keys; then press Ctrl and f together. This allows you to open a file. If you type the name of a file that does not exist yet, this new file will be created
    * you save a file with C-x C-s; hence you can quickly save a file by pressing these keys without having to reach for the mouse
    * the emacs configuration below helps as it uses the which-key package. After typing C-x, it shows you what other keys you can use.

There are other great introductions to emacs as well:

- `https://www.youtube.com/playlist?list=PL9KxKa8NpFxIcNQa9js7dQQIHc81b0-Xg`

- https://www.youtube.com/playlist?list=PLwTHcico4iPMlBZPin6catRcUDzf7NNVs
- or google emacs tutorial or emacs for beginners
- finally, emacs is self documenting: all information can be found in emacs as well, just type C-h i
  - this gives information on emacs and all the packages you installed with emacs

A.6 next steps

You can extend the configuration of emacs by yourself, e.g. by watching tutorials like: https://www.youtube.com/playlist?list=PLEoMzSkcN8oNmd98m_6FoaJseUsa6QGm2

Or you can use pre-configured emacs distributions like scimax and doom emacs.

A.6.1 scimax

Scimax is developed for engineers, but works perfectly well for economists. More details can be found here:

- https://github.com/jkitchin/scimax
- youtube playlist with scimax features: https://www.youtube.com/playlist?list=PL0sMm0aE_gs3E0OjExoI7vlCAVygj6S4I

A.6.2 Doom

Emacs has an absurd number of features and how do you choose the right ones if you do not know about them? Doom emacs has very reasonable default settings:

- https://github.com/hlissner/doom-emacs
- Doom emacs for noobs: https://www.youtube.com/watch?v=iab2z21cRqA
- Doom emacs getting started: https://www.youtube.com/watch?v=dr_iBj91eeI
- youtube playlist: https://www.youtube.com/playlist?list=PLhXZp00uXBk4np17N39WvB80zgxl