Thesis title

Adam Smith

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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.

SNR: 12345
ANR: 98765

Supervisor: Alfred Marshall
Second reader: Karl Marx

Contents

1 Introduction

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

Alternatively, you can use latex directly in which case you can consider the file in this repository that ends in `.tex`.

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

2 Literature references

There are a number of ways in which you can do literature citations in org-mode. We will work with org-ref:

- `https://github.com/jkitchin/org-ref`

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 Prager and Schmitt [2021].

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).

The bottom part of the screen then gives you possible papers to cite from your `references.bib` file.

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}`. For org-mode you need to add `#+name: name_of_label` to tables and figures.

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

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.

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

Creating tables in org mode is a lot easier than in latex. Just type "|" name of column, another "|" name of second column, etc. end the line with "|", then press TAB.

If you want a horizontal line, type "|—-" and press TAB.

In org mode (not in latex) you can add spreadsheet type calculations. 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:

```
\begin{table}[htbp]
\caption{\label{table1} This table shows unemployment and gdp per head.}
```

[1] This is a footnote.

```
\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 will generate with python code in the appendix using the data in Table 1.

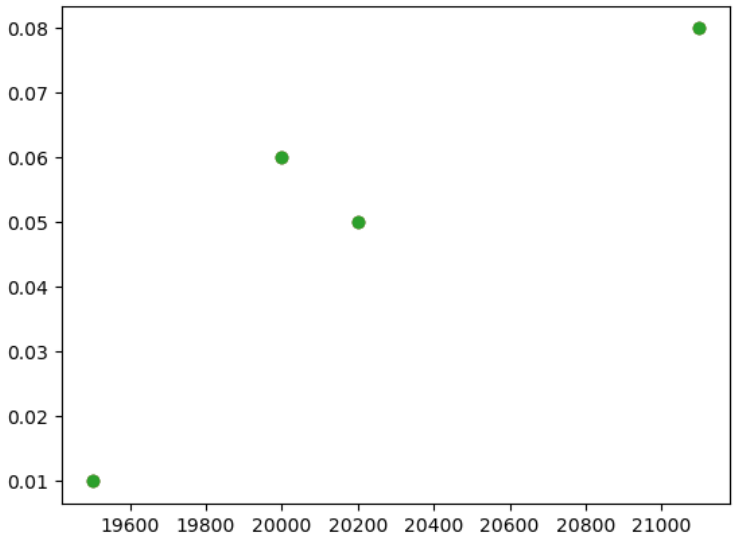

Figure 1: Figure with unemployment and gdp

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 model 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.
  - 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

4.1.1 simple column operations

123456789 123456789 123456789 123456789 123456789 123456789 123456789 123456789 123456789

4.2 Advanced

- combine code and latex
- spreadsheet type capabilities
- export to other formats, e.g. html

4.2.1 more realistic column operations

Turn the table here: `http://fmwww.bc.edu/ec-p/data/oecd/oecd.ctylist.html` into a python dictionary:

- C-v and block the start of each line
- I and type '; then press ESC
- block at the end of the abbreviation with C-v
- type I and ' : '; then press ESC
- block spaces (tab) to delete
- block all lines with C-v
- type $ A ',; then press ESC
- delete superfluous , at the end
- add {} to turn this into a dictionary
- a video on how to do this with regular emacs keybindings, can be found here: `https://www.youtube.com/watch?v=pcA5NeEudgU`

```
dict = {
'AUS' : 'Australia',
'AUT' : 'Austria',
'BEL' : 'Belgium',
'CAN' : 'Canada',
'CHE' : 'Switzerland',
'DEU' : 'Germany',
'DNK' : 'Denmark',
'ESP' : 'Spain',
'FIN' : 'Finland',
'FRA' : 'France',
'GBR' : 'Great Britain',
'GRC' : 'Greece',
'IRE' : 'Ireland',
'ISL' : 'Iceland',
'ITA' : 'Italy',
'JPN' : 'Japan',
'KOR' : 'South Korea',
```

```
'LUX' : 'Luxemburg',
'MEX' : 'Mexico',
'NLD' : 'Netherlands',
'NOR' : 'Norway',
'NZL' : 'New Zealand',
'PRT' : 'Portugal',
'SWE' : 'Sweden',
'TUR' : 'Turkey',
'USA' : 'United States'}
dict['NLD']
```

```
Netherlands
```

Another trick we can use in org mode is to paste the table directly from the website:

AUS Australia AUT Austria BEL Belgium CAN Canada CHE Switzerland DEU Germany DNK Denmark ESP Spain FIN Finland FRA France GBR Great Britain GRC Greece IRE Ireland ISL Iceland ITA Italy JPN Japan KOR South Korea LUX Luxemburg MEX Mexico NLD Netherlands NOR Norway NZL New Zealand PRT Portugal SWE Sweden TUR Turkey USA United States

- block the above table with Shift-V
- M-x org-table-create-or-convert-from-region
- and then add header with column names etc. to yield:

abbrev.	country name
AUS	Australia
AUT	Austria
BEL	Belgium
CAN	Canada
CHE	Switzerland
DEU	Germany
DNK	Denmark
ESP	Spain
FIN	Finland
FRA	France
GBR	Great Britain
GRC	Greece
IRE	Ireland
ISL	Iceland
ITA	Italy
JPN	Japan
KOR	South Korea
LUX	Luxemburg
MEX	Mexico
NLD	Netherlands
NOR	Norway
NZL	New Zealand
PRT	Portugal
SWE	Sweden
TUR	Turkey
USA	United States

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/`

More general editors where you can also edit latex:

- atom: `https://atom.io/`
  - and how to use with latex: `https://towardsdatascience.com/setting-up-latex-on-your-atom-editor-7ea624571d50`
- vim: `https://www.vim.org/docs.php`

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_gs3E00jExoI7vlCAVygj6S4I`

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