Article Class in LaTeX

J. Alexander Branham & Henry Pascoe

October 8, 2015

Abstract

This template is a brief introduction to writing in papers in LaTeX. This is where the abstract goes.

1 Why use LaTeX?

There is some learning curve to LaTeX, and you already know Word or Google Docs or some other word processor. Why switch? These are just a handful of reasons:

- LaTeX provides high quality typesetting (much higher than that of Word or similar)

- It is easy to write mathematical equations

- References and citations are easy and automatically formatted (so switching from parenthetical to footnote citation is often as easy as changing a few options)

- Figure and Table insertion is simple (ever try to get Word to place a table where you want it? Nightmare!)

- LaTeX is free and open source

- You will always be able to open a TeX file. Try using Word 2013 to open a document written in Word 97.

The primary difference between Word and LaTeXis that in Word *what you see is what you get*. You control the whitespace, pagination, figure placement and other design elements of the document. In LaTeX, *what you see is what you mean*. You tell LaTeXwhat you want using its syntax in a .tex file and it produces it for you, using decision rules developed by professional typesetters.

2 Sections

You can break a paper up by sections or subsections

2.1 subsection

These can be numbered

subsubsection

or not

3 enumerate

"enumerate lists" are nice numbered lists.

1. enumerate lists are a nice way of organizing information

2. They don't have to be numbered, and they can be nested

   (a) See

   (b) these are nested and not numbered

3. There are other options (for most of what we go over this is the case), you can find them by searching on the internet the package name.

4 itemize

you can also do bullet points in LaTeX

- like this

- second item

  – and they can be nested

    * and nested again

  – so these lists

    1. are pretty flexible.

5 Math, Math, Math

you can write math like this using dollar signs for in text equations $\lambda = \frac{x^2}{u_B}$

Or you can make centered equations with this to make centered equations.

$$y = mx + b$$

Equation numbering can be done by LaTeX as well:

$$Y \sim N(X\beta, \sigma^2) \tag{1}$$

We can reference labels (from equations, figures, sections, etc) with the ref command like this: see Equation (1).

You can also align equations. For many things, including align, adding a asterisk suppresses equation numbering.

$$a^n + b^n = c^n$$

$$\text{if } n \in \{3, 4, 5, ...\}$$

6 References

Reference management is super easy in LaTeX. The easiest way to manage your references is to keep them in a .bib file. Here is a .bib file that includes one reference that looks like this:

```
@Book{zaller1992,
year = {1992},
publisher = {Cambridge University Press},
title = {The Nature and Origins of Mass Opinion},
```

```
author = {Zaller, John}

}
```

That's how the .bib file wants your references formatted. There are *many* programs to take care of this for you (Zotero, Mendeley, JabRef, ebib (for emacs), etc). We can then cite that reference easily either parenthetically (Zaller, 1992) or in text by talking about Zaller (1992).

7 Tables

Table 1: Nonlinear Model Results			
Case	Method#1	Method#2	Method#3
1	50	837	970
2	47	877	230
3	31	25	415
4	35	144	2356
5	45	300	556

There are online table generators which can be helpful. Additionally, most statistical computing software has packages for exporting tables as .tex files. You can reference the table like this Table 1

8 More LaTeXthings

- *Google is your friend!!!* When you run into a problem or don't know how to do something, just google "How to . . . in Latex" and someone has probably asked before!

- knitr allows you to use LaTeX and R in the same document. StatWeave does this for STATA, R, SAS, and MAPLE.

- git is a version control system that plays nicely with LaTeX — say goodbye to "thedocument-final.docx" and "thedocument-finalFINAL.docx"!

– bitbucket is an implementation of .git that offers free private repositories to people with .edu email addresses.

References

Zaller, John. 1992. *The Nature and Origins of Mass Opinion.* Cambridge University Press.

A Installing and using LaTeX

A.1 Installation

LaTeX installations are operating system specific. The download is rather large, so make sure you have a stable internet connection that won't charge you for data overages!

- Windows: Download MiKTeX

- Mac: Download MaCTeX

- Linux: Installation instructions for Ubuntu are here and other distros will be similar

A.2 Using LaTeX

LaTeX by itself is just a program that takes text that has been marked up in a specific way and produces a (beautifully) typeset document (usually PDF). The windows and mac version of LaTeXcomes with an editor, TeXworks. TeXStudio is another LaTeX specific editor. There are many others. You can also opt to use a general-purpose text editor like Emacs, vim, or Sublime instead. Each has very good support for LaTeX.

B tikzpicture

You can also draw figures.

Home

a $\neg a$

Foriegn   Foriegn

s s

0 r_2 0 r_2

Home   Home

e e

0 $r_1 + s$ 0 $r_1 + s$

T   T

c $\neg c$ c $\neg c$

$$r_1 + s - e, \quad\quad r_1 + s - e - \beta_1 - a, \quad\quad r_1 + s - e, \quad\quad r_1 + s - e - \beta_1,$$
$$r_2 - s, \quad\quad r_2 - s - \beta_2, \quad\quad r_2 - s, \quad\quad r_2 - s - \beta_2,$$
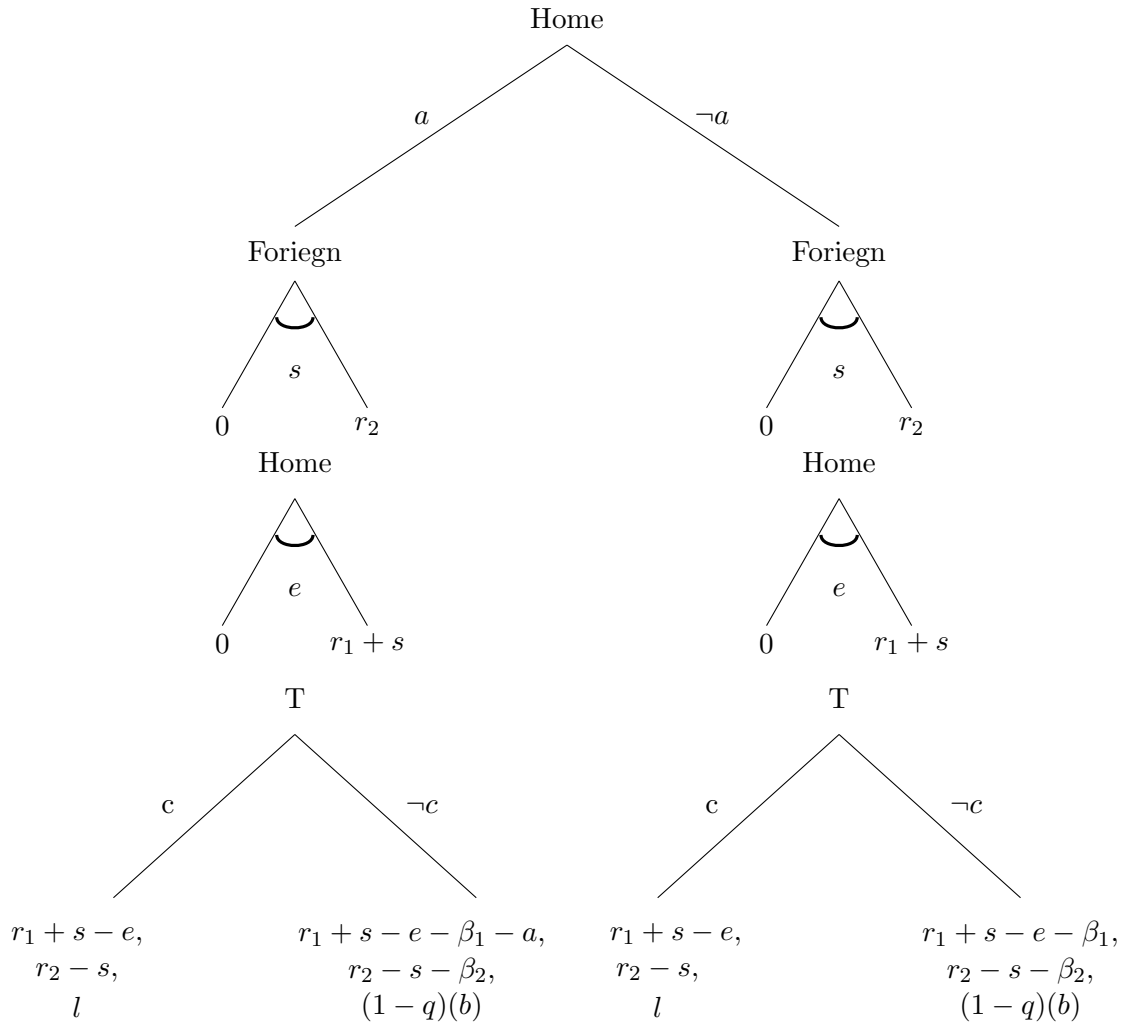$$l \quad\quad (1-q)(b) \quad\quad l \quad\quad (1-q)(b)$$

Figure 1: Example functions