

Some Cool Stuff For Your Paper*

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Abstract

So in this paper, we will have many examples of cool things you can do for your seminar paper. We go over such topics as the bibliography section and references, creating tables with labels, referring to equations and tables versus chapters/sections, and most fun of all, dealing with vector based graphics. Fun times will be had by all.

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1 Introduction

All papers need a good introduction: So this baby seal walks into a club...

2 Bibliography and Citations

So the bibliography is really quite easy once you get a few things straightened out. First, we have to add the ‘cite’ package but using the usepackage command. If you go to the very top of this L^AT_EXfile you will see a few usepackage commands, add one that has ‘cite’ as its argument: \usepackage{cite} (see line 23). This will load the citation package. Next, notice at the end of this L^AT_EXfile but before the appendices, there is a bibliography sections. The last line of this section has the name of the .bib file to read from. All citations go here. Go ahead and load this

*Other people who contributed to this document include the robots of DOOM.

up in WinEdt and you should notice there are only two items in there, with no front matter or end matter. The first one is labeled as a book, the second an article. Either way, they are references use the cite command as seen in the next paragraph.

An example of a citation is this: [2]. Note that if you go to SeminarPaper.bib you and search for “shiskowski2013principles”, you will see a bibliography entry with that name. To reference, use the cite command. Here is another example of a great article: [4].

To easily add new references to your .bib file, simply go to Google Scholar, search for the article and instead of clicking on the article, click the ‘site’ link below it, then select the BibTeX link. This will pop up a screen with the code you copy and paste into a new line in the .bib file. No formatting needed on your part!

Once you have added a references to your .bib file and cited them in your paper, you need to compile with the new references. To do this, start with the usual ctrl+shift+L. After than, do a ctrl+shift+B. The ‘B’ means compile the .bib file. Then do another ctrl+shift+L and then a ctrl+shift+P. This should then produce a document that has now included all references that have been cited. If you have not actually cited a reference from your .bib file, it will not appear in your bibliography at the end of the document.

And one more really cool thing, is that you can put multiple citations in the same cite command. The following articles are really interesting [1,3]

3 Referrals

In Section 3, we will discuss the proper way to refer to objects in the paper. We already know how citations work from Section 2 (note how often I am citing things here). When referencing tables, use ref not eqref. When referencing equations, always use eqref. The eqref will put parentheses around the number, while ref will not. When referencing sections or chapters of subsections etc... use ref as well.

Maybe you need to have the reader refer to Appendix A here?

Maybe you need to have the reader refer to Appendix B here?

4 Tables

Tables are a very nice thing to add to a L^AT_EX document. They are not naturally an equation environment, so if you put fancy math symbols in there, they should be in dollar signs, unless the whole table is in an equation environment, but that can get dicey. Many times, tables look best centered, so consider placing the centering option between the begin table and begin tabular lines (remove it and play around with how it looks in your document if you want). Immediately following the begin tabular, there is a set of curly brackets with some c’s and vertical bars in it. For this example, there is only one vertical bar, but for each one, a vertical bar is placed in the table between the two columns it divides. Each character, usually a c, r, or l tells L^AT_EX how to align that column: ‘c’ is for center, ‘r’ is for right, and.... you guessed it, ‘l’ is for left. You can add a caption, and in that caption you can even add references to equations! To make a label for your table so it can be referenced later, you use the label environment after the caption environment which is immediately after the end of the tabular environment. For instance, we can do a truth table, because they are fun, for the following sentential function:

$$[(p \rightarrow q) \wedge (p \rightarrow r)] \rightarrow [p \rightarrow (q \vee r)], \quad (1)$$

Be aware – if you have a large table or figure, it will try to place it in a ‘convenient’ spot, usually at the top of a page. To try to get around this, there is an option in square brackets after the begin table, the one below has ht! inside it. The ‘h’ stands for here, the ‘t’ stands for top, and the ! stands for ‘try really hard to do this’. Play around with this if you want, this author almost always uses the ht! options.

p	q	r	$[(p \rightarrow q) \wedge (p \rightarrow r)] \rightarrow [p \rightarrow (q \vee r)]$
T	T	T	T
F	T	T	T
T	F	T	T
F	F	T	T
T	T	F	T
F	T	F	T
T	F	F	T
F	F	F	T

Table 1: Derivative truth table for sentential function (1)

Table 1 looks pretty nice, doesn’t it? There are many things you can do with tables, some of which allow you to have tables run over multiple pages. This can be accomplished with the longtables package. However, in such instances, it might be best to put tables of this magnitude in an appendix (we have two appendices in this paper, Appendices A and B).

5 Theorems

Ok, to add theorems to the table, we need to add at least one more package, the amsthm package. Line 26 adds this, along with several other packages that might come in handy. To actually set up the theorems in the paper, you will need to add a theoremstyle and theoremenvironment (see lines 50–52). Normally, plain theoremstyle is sufficient. You can have all sorts of nifty theorem environments. The standard is just a vanilla theorem which is labeled according to chapter/section/subsection etc... For this paper, you should use the [section] option (see line 51). The theorem environment on line 52 looks close to that of line 51, but with a star after the theorem. This is an option that allows you to have a theorem which is not numbered.

It should be noted that if you include the proof of a theorem, there is a ‘proof’ environment, which ends with a square box, very nifty! In Subsection 5.1 we use the numbered theorem approach. Note that they are numbered according to the section. The author includes two here, just for your enjoyment!

5.1 Labeled Theorems

Theorem 5.1. *Let x and y be arbitrary, then the following holds:*

$$x > y \longleftrightarrow y < x.$$

Proof. To begin the proof of Theorem 5.1, we must first rewrite the biconditional statement as the conjunction of two conditional sentences:

$$(x > y \rightarrow y < x) \wedge (y < x \rightarrow x > y)$$

To prove the theorem, we simply prove each of the conditional statements given. We start with the second statement, and assume its hypothesis. Furthermore, we will also make use of the fact that the following sentences are all equivalent:

$$\begin{aligned} p \vee q \vee r &\leftrightarrow \sim p \rightarrow q \vee r \\ &\leftrightarrow (\sim p \wedge \sim q) \rightarrow r \end{aligned} \tag{2}$$

(1)	$y < x$	Assume hypothesis
(2)	$y < x \rightarrow x \not< y$	Instance of Axiom 2, $y : x, x : y$
(3)	$x \not< y$	Rule of Detachment, (1) and (2)
(4)	$x \not< y \rightarrow (x = y \vee x > y)$	Axiom 1 via (2)
(5)	$x = y \vee x > y$	Rule of Detachment, (3) and (4)
(6)	$x \not> y \rightarrow x = y$	Instance of $p \vee q \leftrightarrow \sim p \rightarrow q$ $p : x > y, q : x = y$
(7)	$x \not> y$	Secondary Assumption
(8)	$x = y$	Rule of Detachment, (6) and (7)
(9)	$y < y$	Rule of Replacement, (8) and (1)
(10)	$x = y \rightarrow y < y$	Instance of $\text{True}_1 \rightarrow \text{True}_2$ $\text{True}_1 : x = y, \text{True}_2 : y < y$
(11)	$y \not< y$	Instance of Theorem 1, $x : y$
(12)	$y \not< y \rightarrow x \neq y$	Law of Contraposition on (10)
(13)	$x \neq y$	Rule of Detachment, (11) and (12)
(14)	$x \neq y \rightarrow x > y$	Law of Contraposition on (6)
(15)	$x > y$	Rule of Detachment, (13) and (14)

Note that we have finally arrived at $x > y$ after exhausting the other two possibilities, namely: $x < y$ and $x = y$. We were able to deduce $x \not< y$ directly from assuming the hypothesis and Axiom 2. To arrive at $x \neq y$, we had to make the secondary assumption that $x \not>$ to get $x = y$ and then derive a contradiction via an instance of Theorem 1. We finally arrive at $x > y$.

Of course, this is only the first half of the proof, we must still argue that $x > y \rightarrow y < x$. This however, is done exactly the same way as the first half, due to symmetry, and is left as a quick exercise for the interested reader. \square

Theorem 5.2. *Let x and y be arbitrary, then:*

$$x \neq y \longleftrightarrow (x < y \vee y < x).$$

Proof.

- | | | |
|-----|---|---------------------------------|
| (1) | $x \neq y$ | Assume hypothesis |
| (2) | $x \neq y \rightarrow (x < y \vee x > y)$ | Axiom 1 via (2) |
| (3) | $x < y \vee x > y$ | Rule of Detachment, (1) and (2) |
| (4) | $x > y \leftrightarrow y < x$ | Theorem 5.1 |
| (5) | $x < y \vee y < x$ | Substitute (4) into (3) |

□

5.2 Unlabeled Theorems

If for some reason you want a theorem with no number (which makes it hard to reference), you can use the theoremnon environment introduced on line 52. But once again, this should only be if you are not going to reference this theorem later on.

Theorem. *For arbitrary x , y , and z real numbers, the following holds:*

$$x + (y - z) = (x + y) - z.$$

Proof. The existence of an x which satisfies $y = z + x$ is guaranteed by Axiom 9. What we need to show is that if any other value u satisfies the equation, then $u = x$. We can use the quantified definition of exactly one to prove this.

- | | | |
|------|---------------------------------------|---|
| (1) | $y = z + u$ | Instance of Axiom 9,
$x : y, y : z, z : u$ |
| (2) | $u = y - z \leftrightarrow y = z + u$ | Instance of Definition $-$, $x : u$ |
| (3) | $u = y - z$ | Rule of Replacement (2) into (1) |
| (4) | $x + y = y + x$ | Axiom 7 |
| (5) | $x + y = (z + u) + x$ | Rule of Replacement (1) into (4) |
| (6) | $z + (u + x) = (z + u) + x$ | Instance of Axiom 8,
$x : y, y : u, z : x$ |
| (7) | $u + x = x + u$ | Instance of Axiom 7, $x : u, y : x$ |
| (8) | $z + (x + u) = (z + u) + x$ | Rule of Replacement (7) into LHS of (6) |
| (9) | $x + y = z + (x + u)$ | Rule of Replacement (8) into RHS of (5) |
| (10) | $x + y \in \mathbb{R}$ | Axiom 6 |
| (11) | $x + u \in \mathbb{R}$ | Axiom 6 |
| (10) | $x + u = (x + y) - z$ | Instance of Definition of $-$,
$x : x + u, y : x + y$ |
| (11) | $x + (y - z) = (x + y) - z$ | Rule of Replacement (3) into LHS of (10) |

□

5.3 Corollaries

After the definition of the theorem environments, on line 53 we introduce a corollary environment. Note that it is also numbered within the section.

Corollary 5.3. *The following must be a true sentence:*

$$x \neq y \rightarrow (x < y \vee y < x).$$

Of course, corollaries are usually obvious things once certain theorems have been proven. In the case of Corollary 5.3, this follows immediately from Theorem 5.2.

6 Concluding Remarks

You should wrap up your paper in this section.

7 Acknowledgments

Thank all your wonderful fans for all their support throughout the years here....

References

- [1] Gabriel Landini. Evidence of linguistic structure in the voynich manuscript using spectral analysis. *Cryptologia*, 25(4):275–295, 2001.
- [2] Kenneth M Shiskowski and Karl Frinkle. *Principles of linear algebra with Mathematica*. John Wiley & Sons, 2013.
- [3] Robert L Swezey and Stuart E Swezey. The consequences of habitual knuckle cracking. *Western Journal of Medicine*, 122(5):377, 1975.
- [4] Richard Wassersug. On the comparative palatability of some dry-season tadpoles from costa rica. *American Midland Naturalist*, pages 101–109, 1971.

A Appendix A - Extra Stuff Part 1

Perhaps you have lots of tables or figures that need to be put in, but would break up the paper too much? Put them here!

B Appendix B - Extra Stuff Part 2

Perhaps you have even more stuff, but different stuff, that needs to go in, so Appendix B it is! Appendices really are for things which really break up the pace of the paper, or are just too large to naturally fit into the middle of the paper. For instance, if you have a table of data that takes up three pages, then