Intermediate LyX: Quick How-To Guide and Recommended Tips

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This is a survey of some key steps in document preparation with LyX. It is intended to facilitate the user's transition from a first-time LyX user to usage of special features that are necessary to make truly professional-quality documents. It also offers advice about interacting with the LyX user interface.

The Center for Research Methods and Data Analysis at the University of Kansas endorses LaTeX as a document preparation framework and we also encourage new LaTeX users to consider LyX as a graphical interface for document preparation. The CRMDA offers guides that range from the elementary first-use of LyX to the completion of a doctoral dissertation with it.

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1 Introduction

This document is a collection of important tips and tricks for authors who are making the transition from Microsoft Word (or similar) to the more structured document preparation framework known as LaTeX.

We'd like to start by criticizing MS Word, but only briefly. We expect most people who find this document already know what's wrong with Word. Its terrible. Many users report severe frustration when trying to format a document in a consistent (and seemingly simple) way. Users have questions like "Why are the fonts not consistent throughout this document?" "Why does Word want to keep adding space between my paragraphs?", "Why does Word not indent correctly when I tell it to?", "Why does Word ignore all the defaults I try to set?". More advanced users, often under pressure of a deadline, wrestle late into the night trying to make Table 4 look like Table 1, and they never quite get there. "Why do my equations/tables/figures look terrible?"

People usually turn to LaTeX when they are either 1) at the end of their wits after an epic struggle with Word, or 2) an advisor or publisher requires them to prepare documents with LaTeX. LaTeX has quite a few powerful features that are not available in Word. In LaTeX, one finds an elegant framework that automatically numbers sections, equations, figures, and tables. Users are able to make cross references between sections and the cross-references update themselves as the author adds more sections and equations.

LaTeX is a document preparation framework that emphasizes consistency and compliance with publishing standards. The proponents say that it allows authors to concentrate on authoring, not concerning themselves with formatting and styling elements that are controlled by publishers. There is perhaps a non-trivial amount of truth in that, but it seems obvious to us that LaTeX does require plenty of formatting labor on the part of an author. There's no denying the fact that writing LaTeX documents is difficult and, like Word, sometimes frustrating. The argument in favor of LaTeX, however, is that, in the end, one can be certain that the result will be internally consistent and visually appealing. And there is another element that factors into our endorsement of LaTeX. It is a free, open source initiative created by a professor (Donald Knuth) for other academic authors. One of the reasons we decline to use Word is that it is an expensive, commercial, proprietary framework.

LyX is graphical interface that can generate LaTeX documents. It is a free, open source program that many consider to be a complete, "drop in" replacement for MS Word. LyX does not produce the output, it relies on the LaTeX document preparation programs to produce high-quality PDF documents. In addition LyX 2.0 now has many features Word users demand, including on-the-fly spell checking, and the ability to track changes.

First time LyX users should probably start with the LyX for beginners material that we have prepared,:`http://pj.freefaculty.org/guides/Computing-HOWTO/LatexAndLyx/LyX-Beginner` (look for the pdf files). This document provides some more detail on elements that we think are necessary for LyX users to produce a truly professional-looking document. It begins with some basic instruction on working with LyX, and then steps through a variety of specific tips that I have accumulated through the first six months of working with LyX and LaTeX.

This document is not a replacement for the LyX website `http://www.lyx.org` or the extensive documentation that is provided with LyX itself. Users are urged to start LyX, hit the Help menu, and spend some time getting acquainted.

2 Insert Floating Tables and Figures

Tables and Figures are "floating" document elements in LaTeX. They are positioned automatically according to principles of publication that are controlled in the document's setup. Users can, quite easily, override the default placement process.

Creating Tables and Figures is a two step process that puzzles most LaTeX users. One creates the floating container, and then inside that container one must create the table or figure to be displayed.

2.1 Make a table

Place your cursor in your document in the vicinity of your discussion about a table. .Click "Insert" -> "Float" -> "Table".

An new table will automatically be numbered. Next to the number, there will be a red box where in which a title is added.

Hit "enter" after the Table's title box. Essentially, that "makes space" for new content. It is like starting a new line. In LaTeX, a numerical array is called a "tabular". Insert one by clicking Insert -> Table ... in the LyX pull-down menus. Specify the desired number of rows and columns (below see 3x3 example) and begin entering information.

The default for the LaTeX tablar in LyX is to have the first row separate from the rest. The LyX GUI makes it easy to customize these lines. The easiest way to describe is as follows. Highlight the whole row, right click and select "More", and uncheck "Bottom Line".

You can use these options to customize the table to your liking,such as adding/removing extra rows or columns, and merging rows or columns with the "multirow" and "multicolum" button (just highlight the cells you would like to merge). You can center the table by right clicking in the float table box, and selecting "paragraph settings". Here is a cleaner version of my table.

2.2 Insert a Figure Float

Place your cursor in your document in the vicinity where you would like to write about a graph. Click "Insert" -> "Float" -> "Figure". The figure will automatically be numbered. Type a title in the little red box.

There is a weird difference in publication standards for figures and tables. While Tables have the title at the top, it is more usual to have titles for Figures at the bottom. If you want your Figure title at the bottom, click at the beginning of the word Figure and hit enter to "make some space" where you can insert a graphic. outside of the red box for the title, but stay inside the "float: Figure" box. Hit "enter" to start a new line. Now you can insert a graphic for your figure by clicking "Insert" -> "Graphics..." and browsing for the file. You will likely want to adjust the size of your figure, and you can change the dimensions by right clicking on the image and selecting "settings". In Figure 1 I have the dimensions specified as 4 inches wide and to maintain the aspect ratio for the height.

Table 1: This is the title of my table

Variable	X	Y
X	1.0	0.3
Y	0.3	1.0

Table 2: This is the title of my cleaner table

Variable	X	Y
X	1.0	0.3
Y	0.3	1.0

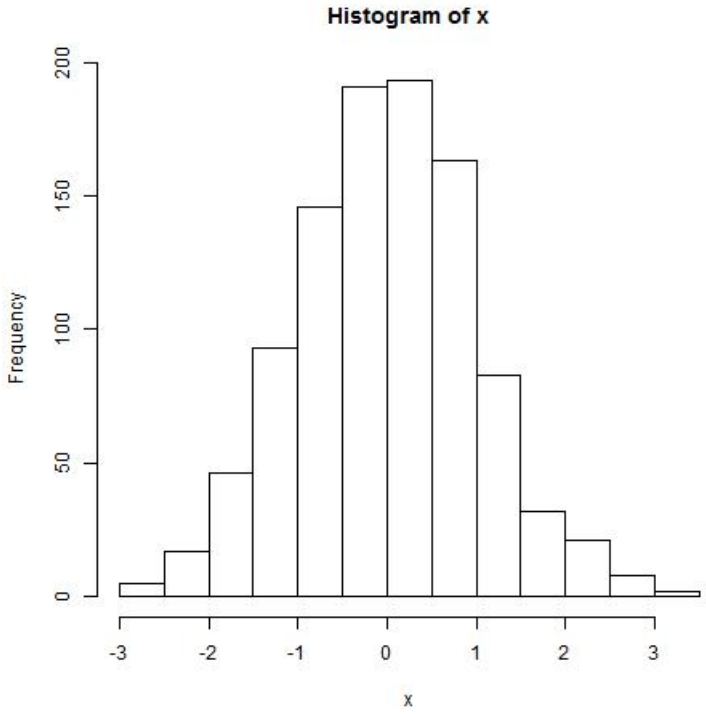


Figure 1: This is the title of my figure, and its on the bottom

2.3 Go back and insert labels

In the title boxes for your figures and tables, it is wise to get in the habit of inserting labels. These do not show in your document, but they can be used for cross references later. To do that, click in the title and use the pull-down Insert -> Label.

3 Mathematics

LyX has an amazing equation editor and I have found much faster to work with than MS Word's default equation editor, or the popular, yet costly ($60) MathType software. Most old-time LyX users will use the shortcut Control-M. There is a pull-down menu, however. Click "Insert" -> "Math" -> "Display formula". This will open a red outlined equation editor box. Below is an example displayed formula.

$$\Sigma_{gt} = \Lambda_{gt} \Psi_{gt} \Lambda'_{gt} + \Theta_{gt}$$

To write your math formula inline with your text, just select "Insert" -> "Math" -> "Inline formula" instead. Now you can type your formula inside of your paragraph. For example, in our previous equation Σ_{gt}= the covariance matrix for each group at each tine point.

A toolbar at the bottom of your LyX window will appear and you can select letters, operators, etc. from there. However, I would strongly suggest you learn some of the keyboard shortcuts in Table 3 below.

3.1 Number the equation

It is easy to number equations by right clicking on the displayed formula and selecting "Number Whole Formula" or "Number this line" depending on your preference. Alternatively, when inserting math click "Numbered Formula". LyX will automatically number your equations. Below is the same equation from earlier now numbered.

$$\Sigma_{gt} = \Lambda_{gt}\Psi_{gt}\Lambda'_{gt} + \Theta_{gt} \tag{1}$$

4 Link Together Several Documents.

Make a child document

If you are writing a document with multiple chapters, such as a dissertation, you may want to keep the chapters in separate files, but have them all follow the same format. For example in the KU Thesis/Dissertation template (see http://www.graduate.ku.edu/formatting and a full set of links on http://pj.freefaculty.org/latex) there is one "master" document that contains all the information for formatting, the title/acceptance page, table of contents, and bibliography. Within this "master" document are "included files" that tell LyX to add other LyX documents in this section. These additional documents are called "child" documents.

To specify that the document you are working on is a child document, click "Document" -> "Settings" -> "Document Class" and check the box "Select default master document". Next, use the file browser to locate the master document.

To include child documents in your master document simply click "Insert" -> "File" -> "Child Document" and browse for the file you would like to include as a child document.

5 Using BibTeX

A full discussion of BibTeX is worthy of its own document and readers are strongly encouraged to learn more about BibTeX and using a program such as JabRef to manage BibTeX libraries. Simply put, a BibTeX file (.bib) is a text file that has the information for all of the references you may want to cite in a document. You can add that BibTex file to your LyX document so that you can then reference articles and have a bibliography/reference section automatically created at the end of your document.

First, you need to link a BibTeX file to your document by clicking "Insert"-> "List/TOC" -> "BibTeX Bibliography". Use the "browse" button to select your .bib file. You will want to make sure a program, such as JabRef, has generated BibTeX keys for all your reference entries, as these keys are what you will use to cite the entry in your document. Next, click the citation style you would like to use. The style "apalike2" seems to produce the best APA version 6 style I have seen. You should now see a grey box in your LyX document that states "BibTeX Generated Biblography". When you compile your document, your bibliography will be printed here.

To insert an in-text citation into your document click "Insert"-> "Citation", and a new window will open. If you have successfully added your BibTEX library, a list of available citations will appear in the left box. You can add the citations you want to use to the "Selected Citations" box and then customize how you would like the formatting to appear under the "Citation style:" drop-down menu. If you are using a BibTEX style such as apalike2, then your citations will automatically be ordered correctly in text. Any in-text citations you insert will automatically referenced in your BibTEX generated bibliography. Assuming you have set up everything correctly, you no longer will need to do a reference check on your documents.I am beginning to wonder how I wrote papers without this feature.

6 Tips and Tricks

6.1 Use cross-references

This is most likely my favorite feature of LYX. Imagine you have created a document with several numbered equations, tables, and/or figures. Perhaps a reviewer asks you to add a table at the start of your document. If you prepared your document in MS Word, this most likely means that you must manually go back and renumber all of your tables (e.g., the former Table 1 becomes Table 2, Table 2 becomes Table 3). In addition, you would need to make sure in your document every time you referred to the table formerly known as Table 1, you now change it to Table 2. This process can be incredibly tedious and error prone.

With LYX, you can use the cross-reference feature to avoid this problem. You can think of a cross-reference as a tag or a label for your stuff that you can use in the document instead of manually typing out the number. Suppose we want to reference our numbered equation from above.

1. First we need to create a label for our equation. Right click on the numbered equation and select "Equation Label"
2. Give your equation a name. I recommend sticking with short names, and maintaining the suggested prefix "eg:"
3. In your document locate where you would like to reference the equation's number.
4. Click "Insert" -> "Cross-Reference..." and select the label for the equation you just created.

A gray box titled "Ref:eq:YOUR_LABEL_HERE" will appear in the text. When you compile your document, this box will be replaced with just the number for the equation. For example, here's my reference for the above equation 1.

Cross-references can be used for many things, including tables, figures, and equations. You now can just use these cross references in your document instead of typing out "Table 1", "Equation 1.2", or "Figure 3" every time you want to reference the item. This feature is incredibly helpful!

6.2 Use keyboard shortcuts

LYX has several keyboard shortcuts that can save you time and free you up from being mouse dependent. First, you can view the default keyboard shortcuts by clicking "Tools" -> "Preferences" -> "Editing" -> "Shortcuts". There's a search bar called "Show key bindings containing" where you can type in what you may be looking for. Many standard keyboard shortcuts like Ctrl+s for save, Ctrl+c for copy, Ctrl+v for paste, Ctrl+z for undo, Ctrl+b for **bold** text and Ctrl+u for underlined text all work. However, Ctrl+i does NOT work for *italics*. For that, use Ctrl+e.

Table 3: LyX Keyboard Shortcuts

Action	Shortcut
View PDF of document	Ctrl+r
Update PDF of document	Ctrl+Shift+r
Insert numbered section	Alt+p 2
Insert numbered subsection	Alt+p 3
Insert numbered subsubsection	Alt+p 4
Begin an itemized bullet-list	Alt+p i
Begin a numbered list	Alt+p e
Return to standard paragraph format	Alt+p s
Insert math formula	Ctrl+Shift+m
Insert inline math formula	Ctrl+m
(In math mode) subscript	_ (underscore)
(In math mode) superscript	^ (Shift+6)
(In math mode) add Greek letters (e.g., Σ)	\"Name of letter" (e.g., \Sigma)
(In math mode) add lowercase Greek letter (e.g., σ)	\"name of letter" (e.g., \sigma)
(In math mode) exit math formula	tab

Note. The "+" indicates that you press the keys together. For example, to create a new section in your document press both Alt and P, release the keys, and then press the 2 key.

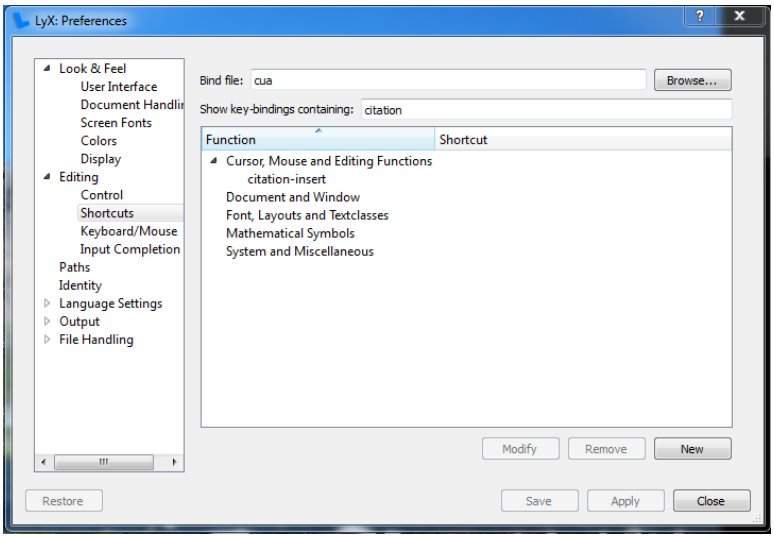
6.2.1 Default keyboard shortcuts

Here are a few default keyboard shortcuts I try to remember. Recall, the "+" symbol means you press the keys together.

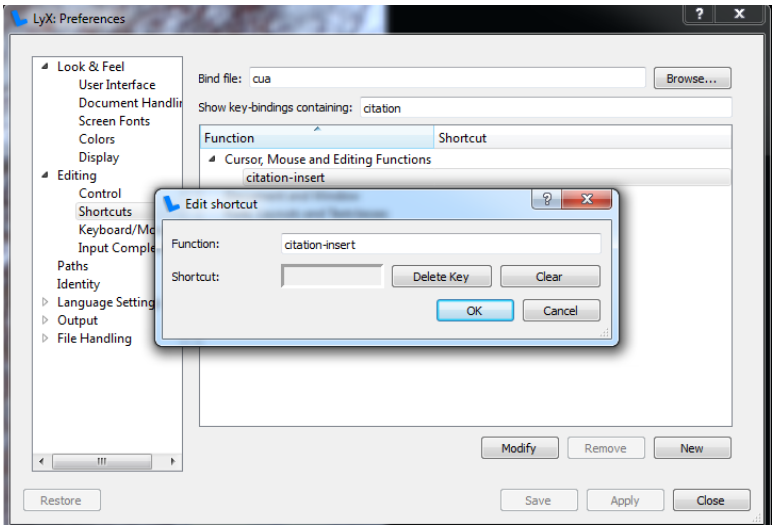
6.2.2 Create your own keyboard shortcuts

You may want a shortcut to perform a task quickly. For example, when writing my dissertation I wanted a keyboard shortcut to insert citations so that I did not have to click "Insert" -> "Citation" every time I wanted to cite something. There was no default keyboard shortcut, but LyX allows you to make your own. Here is an example of how to create a shortcut for that task.

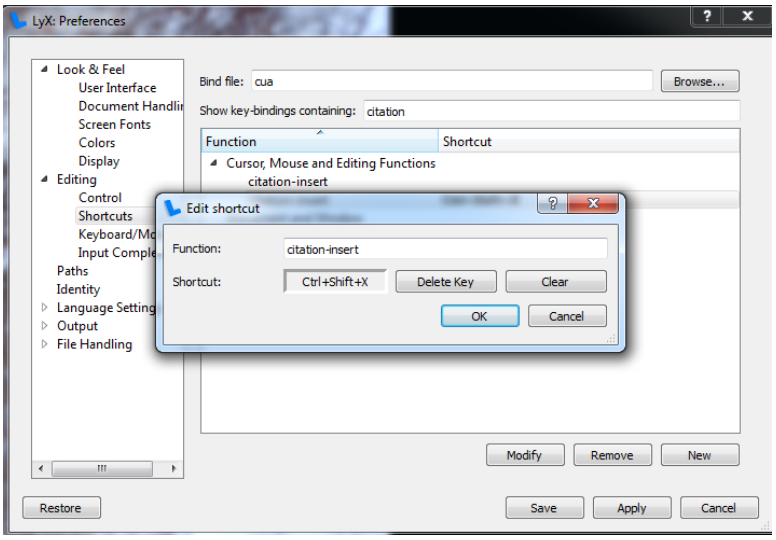
Click "Tools" -> "Preferences" -> "Editing" -> "Shortcuts". Search for the function you would like to make a shortcut for by typing in the "Show key-bindings containing" box. Here I have typed "citation" to find the insert citation function.



Click on “citation-insert” and click “Modify”.



On the “Shortcut:” line click in the empty gray box. Now press the set of keys you would like to be the keyboard shortcut for the function. If you press a set of keys that are already assigned to a function, you will be given an error and told to try a new set. Here I have selected Ctrl+Shift-X to be my shortcut for inserting citations.



Click "Ok" and "Save" to save your shortcut. I have no good reason for why I selected Ctrl+Shift-X besides the fact that a) it seems the keyboard shortcut was not being used for another function in LyX, and b) I could easily press the keys with one hand. Just be sure you do not overwrite some important function.

6.3 Add notes or comments in your document

Notes can be added in a document that are viewed in the LyX editor, but not in the final produced PDF. To add notes simply click the yellow note icon on the toolbar, or click "Insert" -> "Note" -> "Lyx Note". If you are viewing this document in LyX, you should see my note. LyX notes are not printed or exported to LaTeX.

Notes are different from comments. Comments are exported to LaTeX as LaTeX comments, but they are not printed in the PDF.

Finally, Greyedouts are text entries that are printed in the final document as grey text. This is my Greyed out example. You can change the color of Greyedouts by clicking "Document" -> "Settings" -> "Colors".

6.4 Turn on/off on-the-fly spell checker

I like "on-the-fly" spell checking where misspelled words are underlined with a red squiggly line. You can turn this feature on in LyX by clicking "Tools" -> "Preferences". In the toolbar on the left select "Language Setting"-> "Spellchecker" and check the box "Spellcheck continuously".

When this feature is on you will have red dots underlining words spellchecker thinks are misspelled. Right click and select the correct suggested word, or if you are confident you have spelled the word correctly, you can add it to the dictionary so that spellchecker no longer views the word as incorrect.

6.5 Compare two documents

Perhaps you have an older version of your document, or a collaborator has sent you a document with changes, but saved it as the same file name as the previous document. If tracked changes was not used, how can you figure out what changes were made without reading the whole new document?

Click “Tools” -> “Compare...” and select the two files you would like to compare. LyX can even create a new document with the differences between the two tracked.

6.6 Use split view

You can use the “split-view” feature in LyX to view two parts of your document at the same time. Click “View” -> “Split view into top/bottom” or “left/right”. Now you can see what you wrote in one part of your document while you work on another part of your document. To leave the view click “View” -> “Close current view”.

6.7 Insert extra space where you want it

If you want extra space between two sections of text, or maybe space between the end of your table and the table’s note, you can add extra space by clicking “Insert”->”Formating” -> “Horizontal Space...” and specifying your options. More info about spacing can be found here: http://wiki.lyx.org/FAQ/Spacing

7 Final Thoughts

This document has only focused on how to use LyX for producing documents, but the program can also be used to produce presentations that one may traditionally have created using MS PowerPoint. The beamer template that comes preloaded in LyX is a great start for interested users. In addition, for individuals who have used MS Word to produce figures, such as path diagrams, a free program called Dia is a quite useful alternative. A quick guide can by found in KU CRMDA KUant guides (http://crmda.ku.edu/kuant-guides).

The largest drawback to LyX will most likely be collaborators who do not use it. There are a few suggestions on how to take your LyX document and turn it into a Word doc, or vice versa (see http://wiki.lyx.org/FAQ/ImportExport), but these methods may not be very reliable. If at all possible, I recommend beginning your document in LyX rather than trying to move a Word doc over to LyX later. Note, that because you can export the document as a PDF, other readers can still use software such as Adobe X to edit/comment on your document. However, actual text editing would need to be down in LyX or a text editor.

LyX can take some time for new users to learn, but this time can be a very good investment. Many questions you have about LyX can quickly be resolved by an internet search. LyX has a built a great online support community. Once you get the hang of LyX, you will likely find that you are able to write more with less distractions, and produce beautifully formatted documents quicker. Moreover, LyX provides greater flexibility and power to the user.