LyX/knitr Template

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1 A little about LyX

LyX makes writing LaTeX easy/pretty. LyX writes LaTeXbehind the scenes, which then gets compiled into a PDF. So if you have a problem, try searching the LyX help files and web resources, then the LaTeXones. Similarly, when writing, if you can't find a feature in LyX, you can hit Control-L to insert raw LaTeX, which displays as being surrounded by a red box.

The key to LyX is that it doesn't let you determine the exact placement of text easily. This sounds like a bug, but it is a feature. Instead, you specify structure–sections, subsections, titles, etc.–and LaTeXchooses how and where to display them. No more hunting around for that font size change somewhere in the giant block of text in Word.

There are some cool features like cross-referencing and bibliographies that you should explore. Plenty of help on the internet.

2 A little about knitr

Just as LyX content gets converted into LaTeXand thence to PDF, knitr knits R and LaTeXtogether by first compiling the sections of a document written in R, inserting the LaTeXresult into the document, then compiling the LaTeXto PDF. Writing knitr in LyX works the same way.

Thus all you have to do to insert some R code is hit CONTROL-L to get the red box that means you're typing raw LaTeX, then use the code which tells knitr to run the R, take the output of that R code and convert it to LaTeXand insert it into that point in the file. That code is Sexpr. For instance, if we wanted to calculate a sum, we would find that $2 + 2 = 5$. Orwell fans can rejoice.

There's one last step required to get knitr to work in LyX, although it's already set up in this template. Under the Documents menu, click Settings then Modules, and add the "Rnw (knitr)" module. Now click the googly eyes to compile the knitr file into PDF.

3 How does this help?

There's a lot you can do with knitr, but on the most basic level, it can enable collaborative, reproducible research by pulling in whatever data your partners output and inserting those numbers directly into the text.

4 How do I do that?

4.1 Load data

Put a code block at the top of your document reading in data. The echo=FALSE, messages=FALSE stuff just makes it silent. The <<>>= and @ are the start and the end of the R code.

4.2 Use some values in your text

Data's loaded now as j. Use elements in your text by in-lining the R code with \Sexpr. For instance, we found that the mean value of something or the other was 35.27. We found that the mean value of something else was 27.5 $\pm$ (12.1,38.8). Because it's "live" R code, you can even round in-line, as with 80.76. Or add commas, as with 23,492,475,829,457,383,424.

4.3 Click the googly-eyes in the top left

Remember, you have to compile to PDF each time you want the results to update.

4.4 Explore

You can include dynamically-generated graphs, tables, etc. Anything LaTeXor R can do, knitr and LyX can do.