R + LaTeX = knitr

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R-Ladies
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1. Why I care about R

2. Why I care about LaTeX

3. How to use knitr

4. Why you might care

5. Conclusion

Why I care about R

Actually, I don't think I need to answer this!

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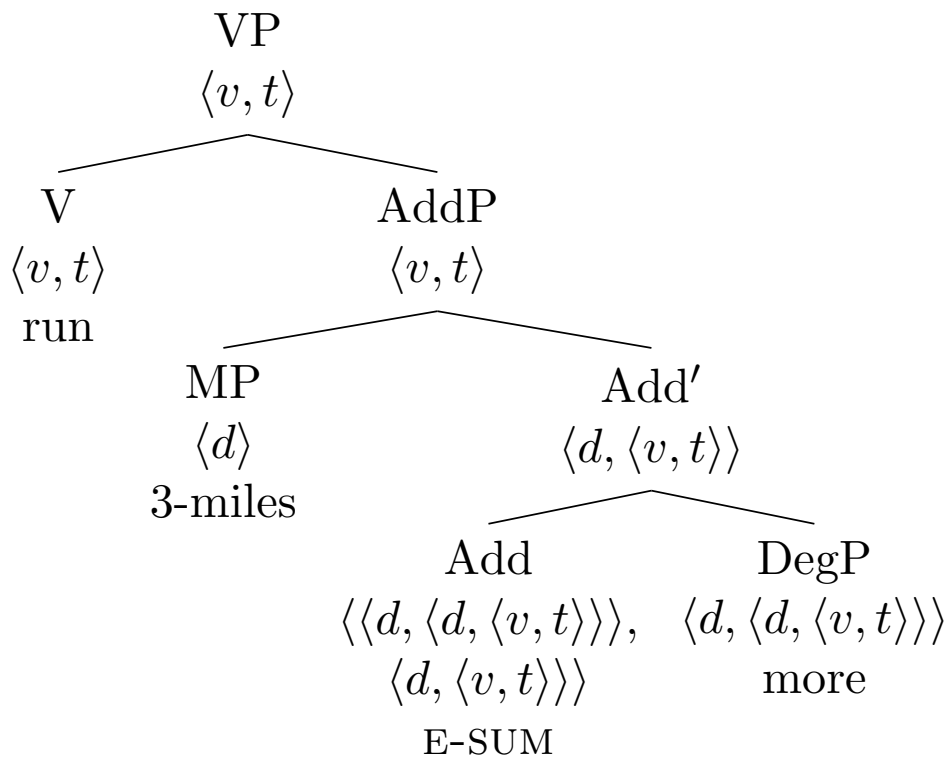
Subfield secret handshakes

(1)



(2) $$[\![\text{E-SUM}_v]\!] = \lambda f_{\langle d,\langle d,\langle v,t\rangle\rangle\rangle}\lambda d\lambda v' \left[\begin{array}{l} \mu(v') = d\wedge \\ f(\mu(v))(d)(v \oplus v') \end{array} \right]$$

Control, flexibility, convenience

There's a package for that.

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```
1     \usepackage{hyperref} % Links, pretty and functional
2     \usepackage{listings} % Prettier code blocks
3     \usepackage{tikz-qtree,tikz-qtree-compat} % Syntax trees
4     \usepackage{amsmath,amssymb,stmaryrd} % Mathy symbols for semantics
```

Control, flexibility, convenience

Write your own commands.

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```
1    % The standard way to note a denotation
2    \newcommand{\denotation}[1]{\ensuremath{\
     llbracket \text{#1} \rrbracket}}
3
4    \denotation{cat}
```

(3) $[\![\text{cat}]\!] = ...$

Control, flexibility, convenience

Automated:

Control, flexibility, convenience

Automated:

- Bibliography and citations
- Labeling and referencing (figures, examples, sections, etc.)
- Commands

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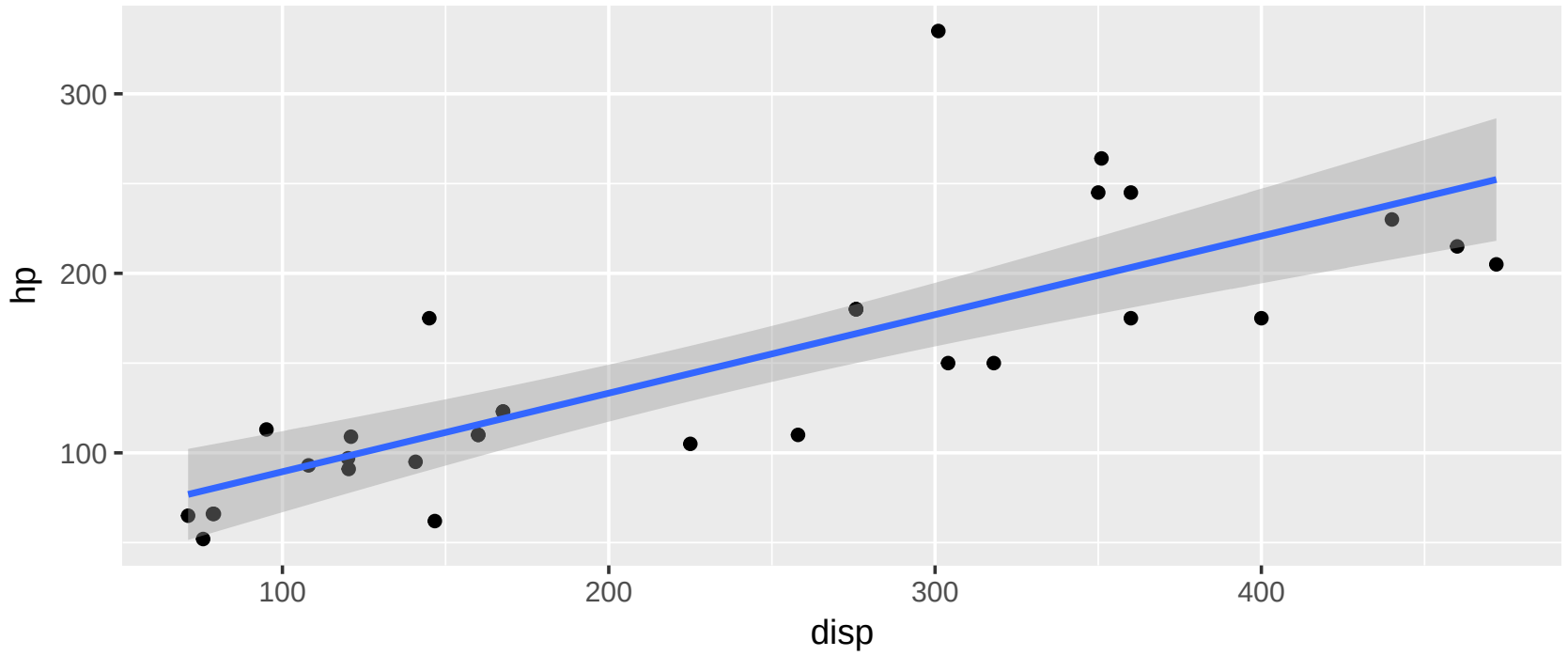
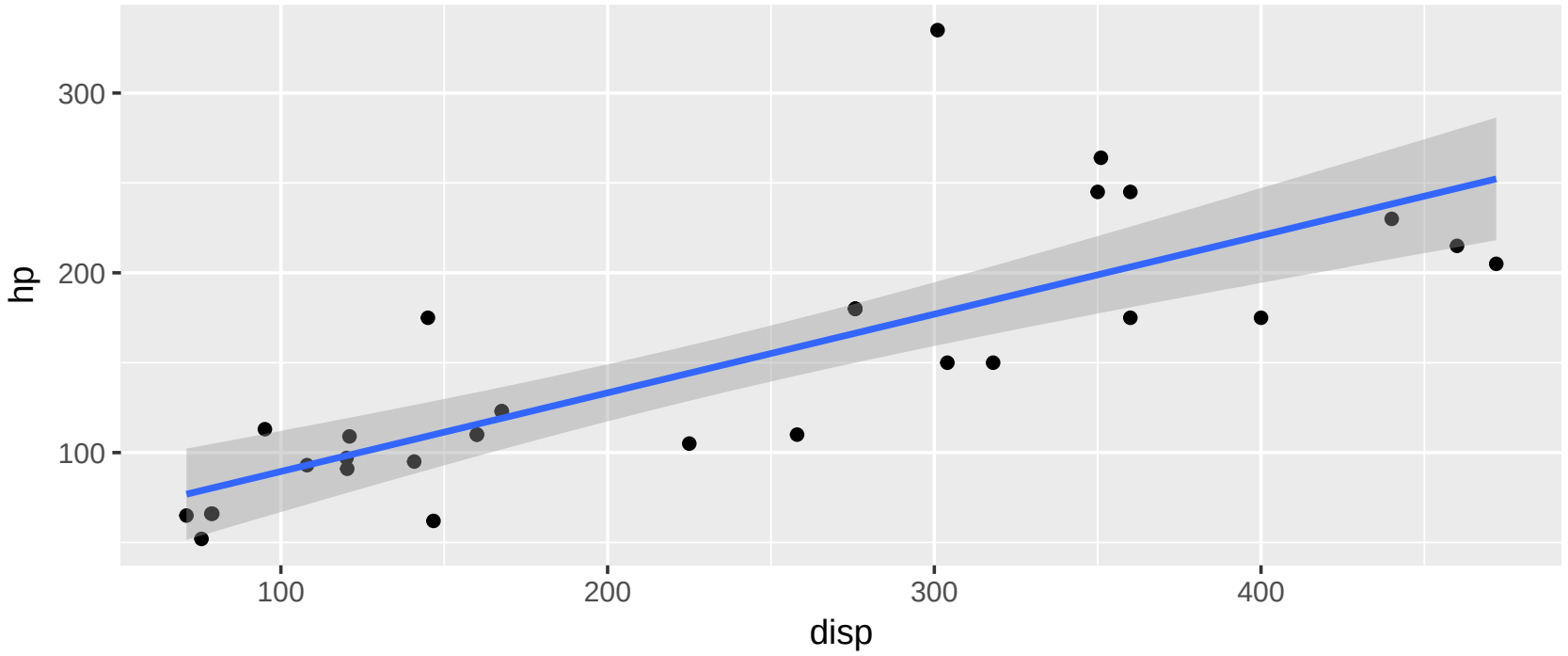
Minimal Working Example 1

```
library(ggplot2)
data("mtcars")
# Is there a relationship between displacement and HP?
ggplot(mtcars, aes(x=disp, y=hp)) +
geom_point()+
geom_smooth(method = "lm")
```



- `echo`= TRUE
- `eval`= TRUE

Minimal Working Example 2



- `echo`= FALSE
- `eval`= TRUE

Minimal Working Example 3

```
library(ggplot2)
data("mtcars")
# Is there a relationship between displacement and HP?
ggplot(mtcars, aes(x=disp, y=hp)) +
geom_point()+
geom_smooth(method = "lm")
```

- `echo`= TRUE
- `eval`= FALSE

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The code is in your document

Reproducibility!

The code is in your document

Say goodbye to:

- Forgetting to update your graph after you add data.
- Grabbing the wrong graph.
- Saving over the graph you want.
- Copy pasting the wrong graph / code into your paper.

The code is in your document

Display it if you want, not if you don't, and change your mind whenever you want.

LaTeX is cool

LaTeX is cool, for all the aforementioned reasons.

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...Or you can use Markdown.

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Conclusion

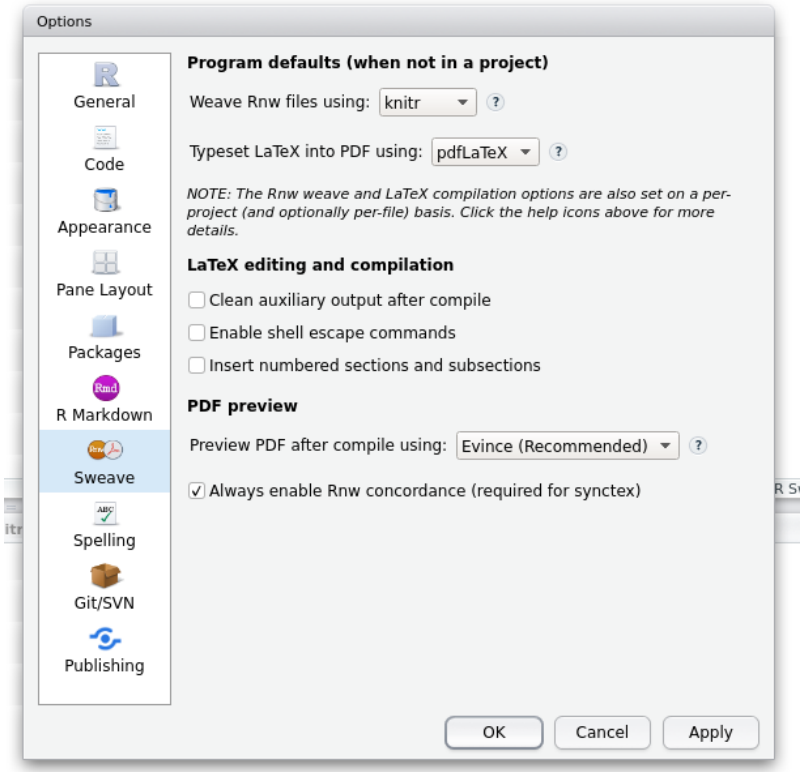
Thanks Yihui! (website, github)

Thanks!

If you want the slides or code, it's available through R-Ladies, or at https://github.com/cfeldscher.
Set up instructions follow in an appendix slide.

Knitr set-up

1. Install package `knitr`
2. Change default from sweave to knitr in the global settings:
3. Create a wholly LaTeX (or Markdown) document in RStudio.
4. Where you want R code, insert a code block.
5. If you're iffy on the above two steps, look at the code for this doc.



LaTeX resources

Installing: https://www.latex-project.org/get/

Other potential resources:

- https://www.sharelatex.com/blog/latex-guides/beginners-tutorial.html[1]
- https://tex.stackexchange.com/

[1] I haven't actually checked these out, but I've found ShareLatex's overviews of packages and such very clear and helpful.

Workflow suggestions

Knitr compiles pretty slowly. This should be your final document, not your testing and exploring data document. Do all that in a different R file, then put the important stuff in a knitr file. Additionally, RStudio doesn't have the LaTeX spellcheck or autocomplete that your usual TeX editor might have, so you should either proofread carefully, or check it in a tex editor.