

Reproducible Research in R w/ rrtools

Harnessing the power of Convention

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Hello and welcome

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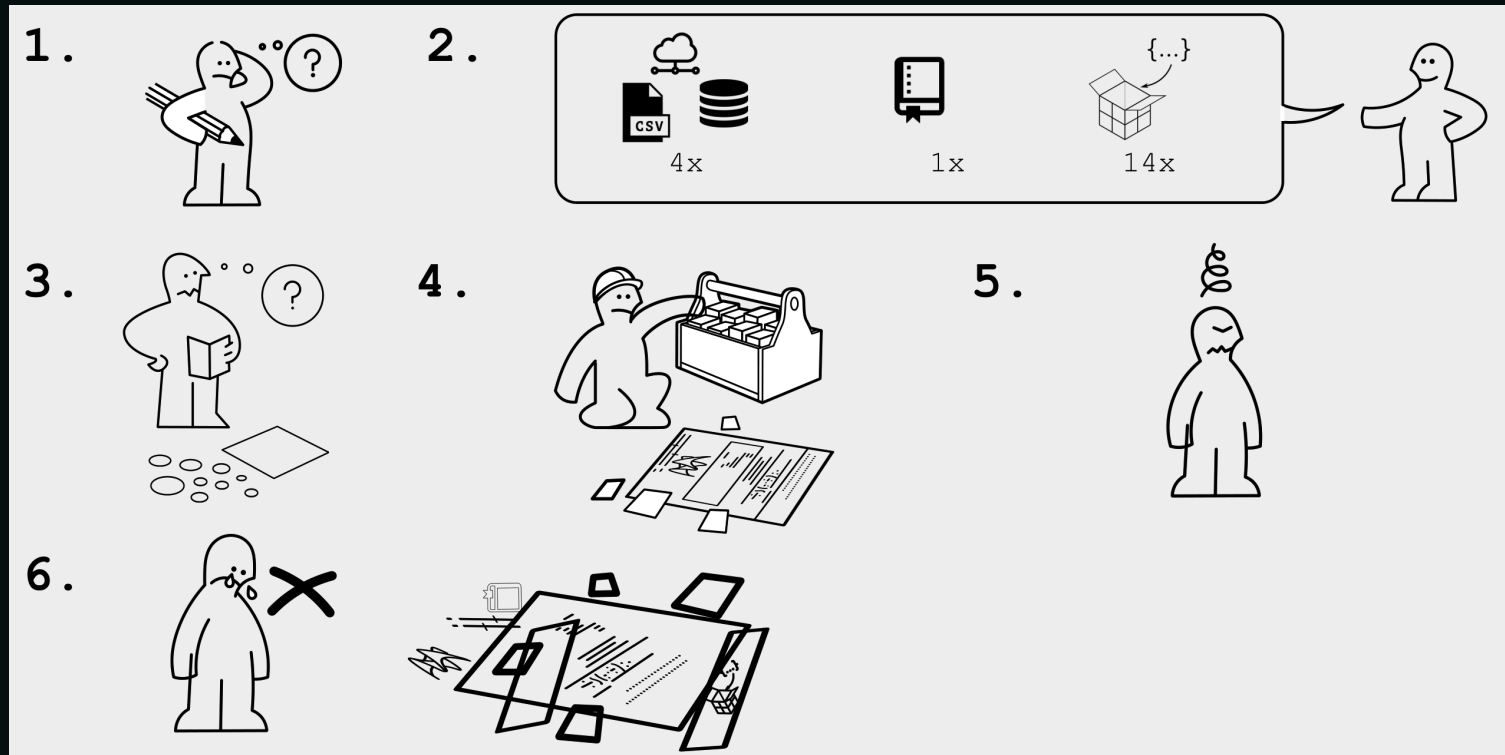
Background

The paper is the advertisement

“an article about computational result is advertising, not scholarship. The actual scholarship is the full software environment, code and data, that produced the result.”

John Claerbout paraphrased in Buckheit and Donoho (1995)

Is published code and data enough?



slides: *Karthik Ram: rstudio::conf 2019 talk*

The concept of a Research Compendium

“ ...We introduce the **concept of a compendium** as both a **container for the different elements** that make up the document and its computations (i.e. text, code, data, ...), and as a **means for distributing, managing and updating the collection.**”

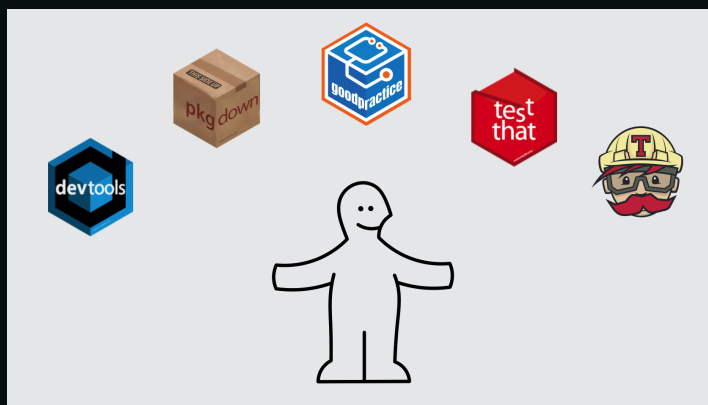
Gentleman and Temple Lang, 2004

The Research Compendium in R

R packages can be used as a research compendium for organising and sharing files!

Ben Marwick, Carl Boettiger & Lincoln Mullen (2018) *Packaging Data Analytical Work Reproducibly Using R (and Friends)*

✨ Harnessing the power of Convention! ✨



slides: *Karthik Ram: rstudio::conf 2019 talk*

Enter rrtools

The goal of rrtools is to provide **instructions, templates, and functions** for making a **basic compendium** suitable for writing reproducible research with R.

github.com/benmarwick/rrtools

rrtools demo

Create a research compendium and recreate a research paper from data, analysis code and text using **rrtools** and friends (eg **usethis**).

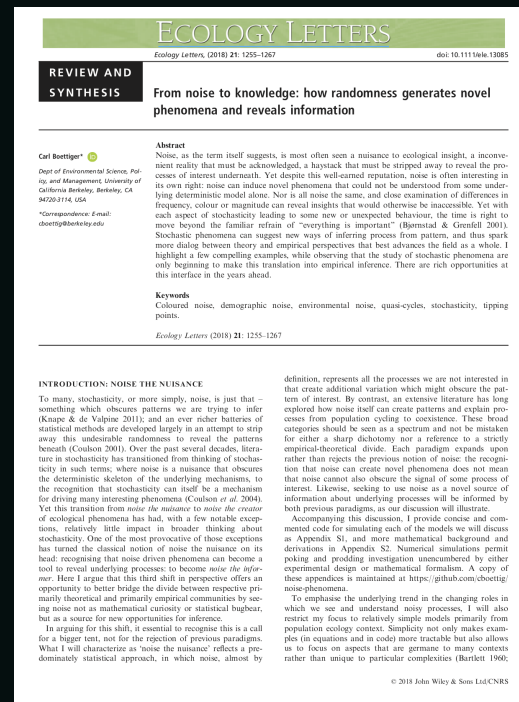
demo materials - source: cboettig/noise-phenomena

Subset of materials from the published compendium of code, data, and author's manuscript:

Carl Boettiger. (2018, April 17). *cboettig/noise-phenomena: Supplement to: "From noise to knowledge: how randomness generates novel phenomena and reveals information"* (Version revision-2). Zenodo. <http://doi.org/10.5281/zenodo.1219780>

accompanying the publication:

Carl Boettiger . *From noise to knowledge: how randomness generates novel phenomena and reveals information*. Published in *Ecology Letters*, 22 May 2018 <https://doi.org/10.1111/ele.13085>



(Semi-) Live demo

In the interest of time, some copying & pasting
will be used

Setup

install LaTeX

Only required if you don't have LaTeX installed

```
install.packages('tinytex')  
tinytex::install_tinytex()
```

On Windows

You might need to install [Rtools](#)

installed workflow dependencies

```
source("install.R")
```

```
install.packages(c(  
  # accesing remote repositories  
  "remotes",  
  #' analysis  
  "dplyr", "ggplot2", "ggthemes", "here",  
  #' bibliographic / publishing  
  "citr", "rticles",  
  #' documentation  
  "roxygen2",  
  #' graphics  
  "Cairo"))
```

installed rrtools

```
remotes::install_github("benmarwick/rrtools")
```

Opened Rstudio

in project `rrtools-rse19` (bit.ly/rrtools-rse19)

loaded some libraries

```
library(rrtools)
library(usethis)
library(testthat)
```

Got materials

```
usethis::use_course("bit.ly/rrtools_wks")
```

```
~/Desktop/rrtools-wkshp-materials-master/
```

```
├─ README.md  
├─ analysis.R  
├─ gillespie.csv  
├─ paper.pdf  
├─ paper.txt  
└─ refs.bib
```

global user settings

.Rprofile

```
usethis::edit_r_profile()
```

```
options(usethis.full_name = "Anna Krystalli",
  servr.daemon = TRUE,
  pkgType = "binary",
  usethis.description =
    list(`Authors@R` =
      'person(
        given = "Anna",
        family = "Krystalli",
        role = c("aut", "cre"),
        email = "annakrystalli@googlemail.com",
        comment = c(ORCID = "0000-0002-2378-4915"))',
      Version = "0.0.0.9000"
    ),
  usethis.protocol = "https"
)
```


.Renviron

Get GitHub PAT

```
usethis::browse_github_pat()
```

- ✓ Opening URL '<https://github.com/settings/tokens/new?scopes=repo,gis>'
- Call `usethis::edit_r_environ()` to open `'.Renviron'`.
- Store your PAT with a line like:
GITHUB_PAT=xxxxyyyzzz
[Copied to clipboard]
- Make sure `'.Renviron'` ends with a newline!

Edit file

```
usethis::edit_r_environ()
```

```
GITHUB_PAT=f0f766313811965a5064174bd919bc770e067ce6
```

Not this one 😊

Let's go! 

follow along at workflows.r

Demo Links

demo materials

bit.ly/rrtools_wks

workflow code

bit.ly/rrtools-workflow

outputs

- Example compendium `rrcompendiumRSE19`
- Example Docker image of compendium

rrtools GH repo


[benmarwick/rrtools](https://github.com/benmarwick/rrtools)

walkthrough GH repo

[annakrystalli/rrtools-rse19](https://github.com/annakrystalli/rrtools-rse19)

Thanks for 🙄👋

Acknowledgements

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