

Introduction to R Markdown

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Literate Programming & Live Documents

“The main idea is to regard a program as a communication to human beings rather than as a set of instructions to a computer.” - Donald Knuth

- Combines ‘human readable’ prose with source code and output in a single document
- Analyses can be more easily understood and reproduced

Replicability vs Reproducibility

- Can you get my results from my data?

Motivating example

- How often do you have code/ideas/figures spread across multiple files?
- An example
 - <https://doi.org/10.1186/1471-2105-11-208>
- Look at Supplementary File 2

What is Markdown?

- Lightweight markup language
- Write text and 'tag' elements for formatting later
 - Similar to LaTeX or HTML, but much simpler
- Can be used to create many types of output

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- Time for a live demo
 - `example_1-layout.md`

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- Basically **R** + Markdown
- You can include blocks of code
- Allows you to keep in a single document:
 - Code
 - Explanatory text
 - Output e.g. tables, figures

A few examples

- <https://mfr.osf.io/render?url=https://osf.io/v6njb/?action=download%26mode=render>
- <https://bioconductor.org/packages/release/bioc/vignettes/BiocStyle/inst/doc/AuthoringRmdVignettes.html>
- <https://www.huber.embl.de/msmb/>

R Code Chunks

- `example_2-codechunks.Rmd`

Introducing R Notebooks

- Consider always using R Markdown!
 - If you're going to write a script, make it Rmd
- Treat writing code like a lab book

sessionInfo()

- Just because you can run a script later, doesn't mean it gives the same answers!
 - R changes
 - Packages change
 - Locale settings etc

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