

R Markdown as Strategy

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Tell Me about your existing R Markdown projects

- reports?
- with templates?
- with Shiny components?
- websites?
- books?
- data prep scripts?
- scheduled?
- how do you share them?

What is R Markdown?

1. An authoring framework for data science
2. A document format (.Rmd)
3. An R package named rmarkdown
4. A file format for making dynamic documents with R
5. A tool for integrating prose, code, and results
6. A computational document

See <https://rmarkdown.rstudio.com/> and Dr Allison Hill's Intro to R Markdown.

How is R Markdown a strategy?

R Markdown can be used in different ways to guide you toward solving your research and business problems

- **Literate Programming**
- **Control Documents**
- **Templating**
- **Data products**

Literate Programming

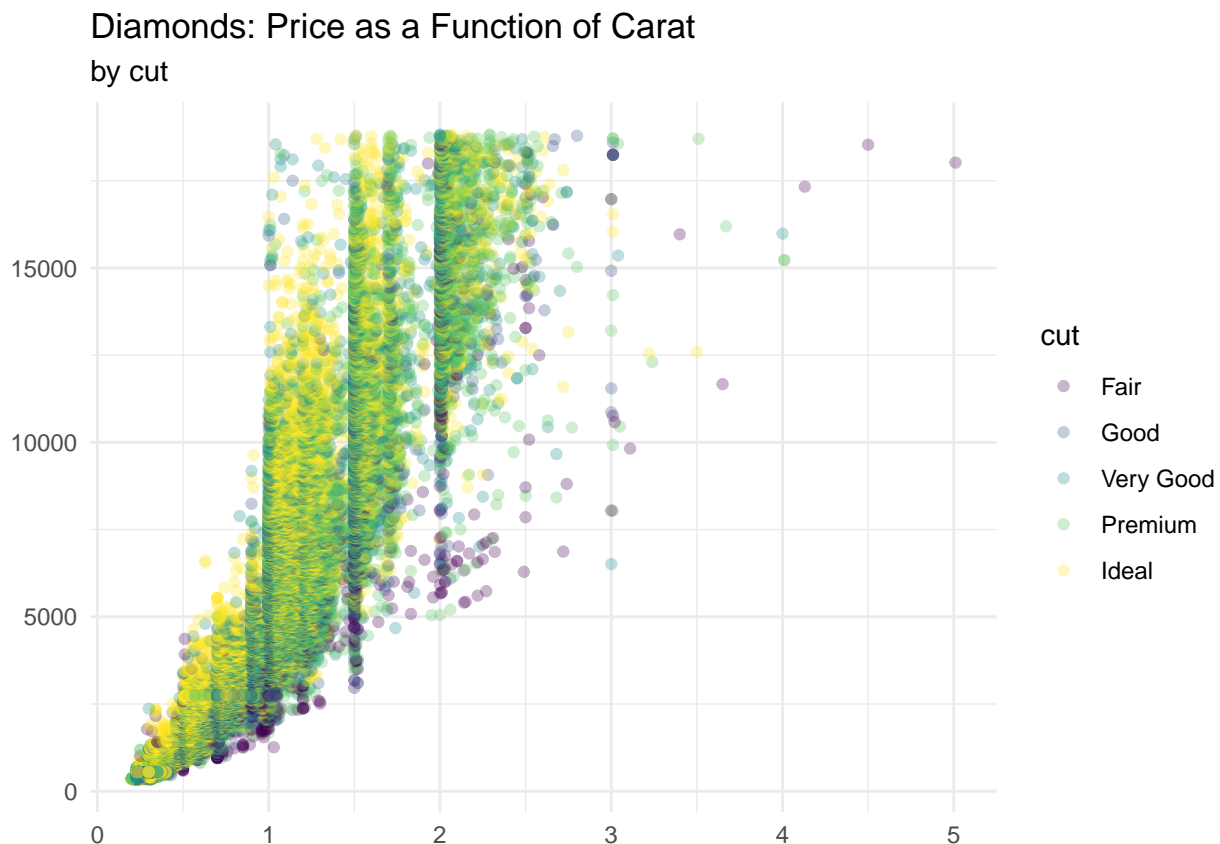
captures code, prose, and output in a single document enhancing learning and repeatability

For example, I can use prose to explain the following code chunks:

In this code chunk I am loading the R packages that will be required for my analysis. The tidyverse is an umbrella package of other packages, including the ggplot2 package. I do not have to load ggplot2 explicitly. The previous two sentences would be a bit much for an in-code comment, but are fine for prose located close to the code.

```
library(tidyverse)
```

```
diamonds |>
  ggplot2::ggplot(aes(x = carat, y = price, color = cut)) +
  geom_point(alpha = .3) +
  labs(
    title = "Diamonds: Price as a Function of Carat",
    subtitle = "by cut",
    x = NULL,
    y = NULL
  ) +
  theme_minimal()
```



More languages:

Literate programming in R Markdown is not just for R. knitr, which computes code in R Markdown, has many language engines. Over 50! Try `names(knitr::knit_engines$get())`.

More reproducible: Combining comments and documentation with your code increases the chance that

others, including future you, will understand your project.

More exploration: See David Robinson's videos in which he quickly explores data sets using R Markdown documents.

Control Documents

scale data science, automate data tasks, and create data pipelines

R Markdown can be a meta-document that lets you bring in other code or automate processes.

- Automation with parameters: such as run a report for state, region, or body of water
- Child Documents: in once document include the content from another .Rmd
- Conditional child docs, see guide
- ETL in .Rmd, especially when scheduled in Posit Connect
- RMarkdown for Emails, see the blastula package

Let's add content from a child document right here (set eval to TRUE):

Templating

simplifies and reduces error in important but repetitive production

Templating through R Markdown templates:

- standard report layouts
- standard themes
- directories
- load standard libraries
- share through packages
- see more in the guide

Templating through parameters:

- Today is 2023-01-10
- see more in the cookbook

Templating through code loops

- knit the doc loops-example.Rmd

Comfortable Data Products

use R Markdown to compute, report, and deliver findings to colleagues and decision makers

- Presentations
- Dashboards
- Reports
- Websites
- Books
- Package sites

Some of the nuts and bolts

Let's play!

- YAML
 - remove table of contents
 - add inline R code for the date using Sys.time()
- Chunk options

Many RMarkdown Formats

Documents	
Notebook	Interactive R Notebooks
HTML	HTML document w/ Bootstrap CSS
PDF	PDF document (via LaTeX template)
Word	Microsoft Word document (docx)
ODT	OpenDocument Text document
RTF	Rich Text Format document
Markdown	Markdown document (various flavors)
Presentations	
ioslides	HTML presentation with ioslides
reveal.js	HTML presentation with reveal.js
Slidy	HTML presentation with W3C Slidy
Beamer	PDF presentation with LaTeX Beamer
PowerPoint	PowerPoint presentation

Figure 1: The large R Markdown Ecosystem

- themes
 - change `html_document` to `tufte::tufte_html`: default
 - see `bslib` theme example in directory
- Add static `ggplot2` graph to the `flexdashbaord` example
- parameters
 - regions, states, bodies of water, years
 - what parameters are you already using?
- ?

Here are four incredible resources on the nuts and bolts

- R Markdown: The Definitive Guide
- Dr. Allison Hill’s Intro to R Markdown
- Dr. Tom Mock’s Higher Faster Further presentation and video
- NOAA examples: Emily Markowitz’s package `NMFSReports` and Dr. Eli Holmes’s workshop R Markdown Reports

Looking ahead to Quarto

- single framework, you don’t need other packages for books, websites, or presentations
- consistent syntax across types
- R is not required, you can use Python or Julia or Observable JS natively in Quarto
- extensible through `pandoc` extensions
- compare to what’s available in R Markdown

Q&A

code