Basic elements of file management

ME447/547 Visualizing Data

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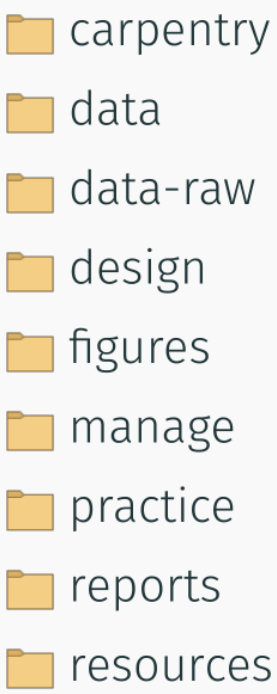
Effective file management requires two actions

Plan the structure at the beginning



Explicitly link files

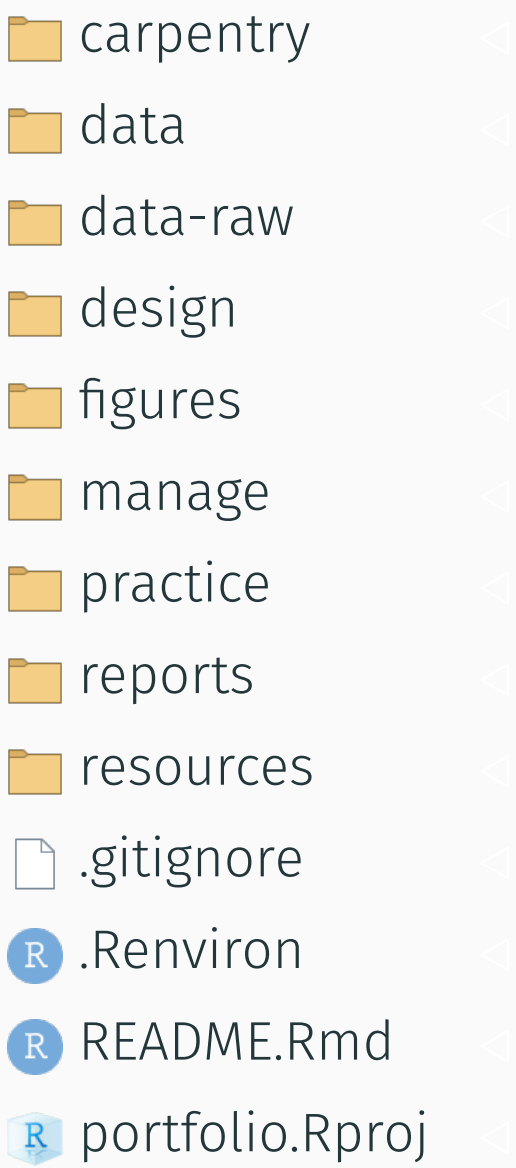
```
source ("carpentry/filename.R")

read_csv("data/filename.csv")

source("design/filename.R")

include_graphics("figures/filename.png")
```

You recently created the mandatory project-directory structure



Open portfolio.Rproj to start every work session

- carpentry
- data
- data-raw
- design
- figures
- manage
- practice
- reports
- resources
- .gitignore
- .Renviron
- README.Rmd
- portfolio.Rproj ◁ Sets the project directory as the working directory

README introduces your portfolio to the reader

- carpentry
- data
- data-raw
- design
- figures
- manage
- practice
- reports
- resources
- .gitignore
- .Renviron
- README.Rmd ◁ Creates the main page of your portfolio website
- portfolio.Rproj

Other top-level files perform administrative duties

- carpentry
- data
- data-raw
- design
- figures
- manage
- practice
- reports
- resources
- .gitignore ◁ Directs Git to ignore specific files
- .Renviron ◁ Stores packages in a library separate from base R
- README.Rmd
- portfolio.Rproj

Raw data are never edited manually

- carpentry
- data
- data-raw ◁ Data in its original form
- design
- figures
- manage
- practice
- reports
- resources
- .gitignore
- .Renviron
- README.Rmd
- portfolio.Rproj

Data carpentry converts raw data to tidy data

- carpentry
- data
- data-raw
- design
- figures
- manage
- practice
- reports
- resources
- .gitignore
- .Renviron
- README.Rmd
- portfolio.Rproj

◁ R scripts that create and save tidy data

◁ Tidy data saved here, read by design scripts

Graph design converts to tidy data to graphs

- carpentry
- data
- data-raw
- design ◁ R scripts that create and save graphs
- figures ◁ Graphs saved here, imported by report scripts
- manage
- practice
- reports
- resources
- .gitignore
- .Renviron
- README.Rmd
- portfolio.Rproj

Reports commingle data, scripts, graphs, prose, and references

- carpentry
- data
- data-raw
- design
- figures
- manage
- practice
- reports ◁ One Rmd report per graph
- resources
- .gitignore
- .Renviron
- README.Rmd ◁ Provides links to individual reports
- portfolio.Rproj

Resource files support the portfolio appearance and format

- carpentry
- data
- data-raw
- design
- figures
- manage
- practice
- reports ◁ Reports explicitly call on resource files
- resources ◁ Image downloads and bibliography files
- .gitignore
- .Renviron
- README.Rmd
- portfolio.Rproj

Reduce clutter by excusing some resources from version control

- carpentry
- data
- data-raw
- design
- figures
- manage ◁ Correspondence and project management
- practice ◁ Scripts for practicing and learning R
- reports
- resources
- .gitignore ◁ Directs Git to ignore specific files
- .Renviron
- README.Rmd
- portfolio.Rproj

Planning at the start of a project saves time later

carpentry	◁ R scripts that create and save tidy data
data	◁ Tidy data saved here, read by design scripts
data-raw	◁ Data in its original form
design	◁ R scripts that create and save graphs
figures	◁ Graphs saved here, imported by report scripts
manage	◁ Correspondence and project management
practice	◁ Scripts for practicing and learning R
reports	◁ Reports explicitly call on resource files
resources	◁ Image downloads and bibliography files
.gitignore	◁ Directs Git to ignore specific files
.Renviron	◁ Stores packages in a library separate from base R
README.Rmd	◁ Creates the main page of your portfolio website
portfolio.Rproj	◁ Sets the project directory as the working directory

Files are explicitly linked

Workflow and explicit links using relative file paths

 carpentry directory

`tidy-data-01.R`

reads file from raw-data directory

```
read_csv("data-raw/first-data-set-raw.csv")
```

produces tidy data and saves to data directory

```
write_csv("data/first-data-set-tidy.csv")
```

Workflow and explicit links using relative file paths

reports directory

`d1-report.Rmd`

includes code chunks that run the R script to produce the tidy data

```
source("carpentry/tidy-data-01.R")
```

execute the R script to create the graph

```
source("design/d1-graph.R")
```

and imports the graph

```
include_graphics("figures/d1-graph.png")
```

Workflow and explicit links using relative file paths

 reports directory

`d1-report.Rmd`

also contains all the prose explaining the data, results, graphs, discussion, and references

References

Bryan J (2018) Excuse me, do you have a moment to talk about version control? *The American Statistician* **72**(1), 20–27 (doi:10.1080/00031305.2017.1399928)

Wilson G, Bryan J, Cranston K, Kitzes J, Nederbragt L and Teal TK (2017) Good enough practices in scientific computing. *PLoS Computational Biology* **13**(6) `https://doi.org/10.1371/journal.pcbi.1005510`