

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

- carpentry
- data
- data-raw
- design
- figures
- manage
- practice
- reports
- resources



























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

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














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	◁ R scripts that create and save tidy data
 data	◁ Tidy data saved here, read by design scripts
 data-raw	◁
 design	◁
 figures	◁
 manage	◁
 practice	◁
 reports	◁
 resources	◁
 .gitignore	◁
 .Renviron	◁
 README.Rmd	◁
 portfolio.Rproj	◁



























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)
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