



R Bootcamp: R Projects and {here}

August 23-24, 2021

UBC | Master of Food and
MFRE | Resource Economics

Learning Objectives

- Describe the benefit of organizing files by course/project
- Set up the working directory in R
- Understand file paths
- Understand what an R Project is
- Describe the advantages of using R Projects for your data analytics workflow
- Understand how to use the `here()` function in locating files

Readings

- [Project-oriented workflow](#) by Jenny Bryan and Jim Hester
- [Workflow: projects](#) in R for Data Science
- [Why should I use the here package when I'm already using projects](#) by Malcolm Barrett

Working directory

- “The **working directory** is just a file path on your computer that sets the default location of any files you read into R, or save out of R.”¹
 - In R, you can only have one working directory at any point in time.

¹ <https://bookdown.org/ndphillips/YaRrr/the-working-directory.html>

Working directory

- To print your current working directory, you use `getwd()`

```
> getwd()
```

```
[1] "C:/Users/krishlim/OneDrive - UBC/Desktop/mfre/mfredataportal"
```

- This file path means that if I ask R to import a dataset (or export a file out of R), it will look for that file (or export a file) in the mfredataportal folder I have saved in the mfre folder in my Desktop.

setwd()

- You can change your working directory using the **setwd()** function
- For example, if I want to change the working directory from the *mfredataportal* folder in my Desktop to *summerbootcamp* folder, I will run the following code

```
setwd("C:/Users/krishlim/OneDrive -  
UBC/Desktop/mfre/summerbootcamp")
```

Issue with setwd()

- The challenge in using setwd() is that this file path only works on my computer.
- You will get an error if you specified your working directory as **setwd("C:/Users/krishlim/OneDrive - UBC/Desktop/mfre/summerbootcamp")**
 - The reason is that you don't have C:/Users/krishlim/OneDrive – UBC/Desktop/mfre/summerbootcamp folder structure in your computer.

Issue with setwd()

- Because setwd(...) is so prevalent, it is quite common to see your colleagues use this code to set the working directory.
- You will also usually see them include a comment to change the working directory to a path that works in your computer.

R Projects and here()

- One way to avoid starting your script with `setwd()` is to use [R Projects](#) and the `{here}` package.

R Projects and here()

- Organize all your files into folders in your computer. For example you can create an **mfre** folder in your Desktop with fre501, fre502, fre516, fre528 as subfolders.
 - This folder structure means that all relevant FRE501 files (that you created or downloaded from Canvas) should “live” in your fre501 folder, not in your Downloads or Documents folders.

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#       |-- fre502
#       |-- fre516
#       |-- fre528
```

R Projects and here()

- You may opt to create folders within each course to be even more organized. For example, you may create a “lectures” folder that will contain all the lecture notes, and a “lab” folder that will contain all the data and code you may use in the course.

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#           |-- lectures
#           |-- labs
#       |-- fre502
#           |-- lectures
#           |-- labs
```

R Projects and here()

- Create an R Project by clicking **File** → **New Project** → **Existing Directory** then locate the mfre folder you just created in your Desktop. This will create a file called mfre.Rproj in the top-level folder.

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#       |-- fre502
#       |-- fre516
#       |-- fre528
#       |-- mfre.Rproj
```

R Projects and here()

- Double click mfre.Rproj **every time before** you open an R script. This will open a new instance of Rstudio with the working directory set to your mfre folder.

R Projects and here()

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#           |-- lectures
#           |-- labs
#               |-- law_of_one_price.R
#               |-- data
#                   |-- wheat_prices.csv
#               |-- assignments
#           |-- mfre.Rproj
```

- Let's say you want to run the `law_of_one_price.R` script that is stored in the `labs` folder of `fre501`. You will need to double click the `mfre.Rproj`, which will launch Rstudio, before opening the `law_of_one_price.R` script.

R Projects and here()

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#           |-- lectures
#           |-- labs
#               |-- law_of_one_price.R
#               |-- data
#                   |-- wheat_prices.csv
#       |-- assignments
#   |-- mfre.Rproj
```

- Let's say you have opened your law_of_one_price.R script and you want to read in wheat_prices.csv.
- Our recommendation is that you use the here() function, so your code will look like
read_csv(here("fre501", "labs", "data", "wheat_prices.csv"))

R Projects and here()

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#           |-- lectures
#           |-- labs
#               |-- law_of_one_price.R
#               |-- data
#                   |-- wheat_prices.csv
#       |-- assignments
#   |-- mfre.Rproj
```

- The `here()` function sets the starting point for the directory from the project level (i.e. the `mfre` folder). So the code `read_csv(here("fre501", "labs", "data", "wheat_prices.csv"))` tells R to start at the `mfre` folder then go to the `fre501` folder then go to the `labs` folder then go to the `data` folder and then find the `wheat_prices.csv`.

R Projects and here()

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#           |-- lectures
#           |-- labs
#               |-- law_of_one_price.R
#               |-- data
#                   |-- wheat_prices.csv
#               |-- assignments
#           |-- mfre.Rproj
```

- `read_csv(here("fre501", "labs", "data", "wheat_prices.csv"))`
- Each subfolder will go into a pair of quotation marks. With this function, you don't have to remember if you use front or back slashes to indicate the next level of the file path.

R Projects and here()

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#           |-- lectures
#           |-- labs
#               |-- law_of_one_price.R
#               |-- data
#                   |-- wheat_prices.csv
#               |-- assignments
#           |-- mfre.Rproj
```

- If you wanted to save a plot you created from the law_of_one_price.R script in the assignments folder, you can use **ggsave(here("fre501", "assignments", "image01.png"))**.

R Projects and here()

- If you don't use the here() function, you will have to “go up” one level from the labs folder to the 501 folder, and then go into the assignments folder.
- The codes differ if you run it within the console and if you run it in R Markdown.
- The advantage of the here() function uses the same syntax either in console or Markdown, hence our strong recommendation to use the here() function. Read [here](#) for more details.

Another example

```
# vancouver_prices.csv saved in the labs folder

# |-- Desktop
#   |-- mfre
#       |-- fre501
#       |-- fre502
#       |-- fre516
#       |-- fre528
#           |-- lectures
#           |-- labs
#               |-- reg_houses.R
#               |-- vancouver_prices.csv
#                   |-- mfre.Rproj
```

- Let's say you wanted to open reg_houses.R script. First open the mfre.Rproj file. Then open the reg_houses.R script.
- If you want to read in the vancouver_prices.csv data saved in the fre528/labs folder, then run

```
read_csv(here("fre528", "labs",  
"vancouver_prices.csv"))
```

Another example

- `read_csv(here("fre528", "labs", "vancouver_prices.csv"))`
- This code can be read as, starting from the mfre folder, go into the fre528 folder then the labs folder and then read the Vancouver_prices.csv file.

Another example

```
# |-- Desktop
#   |-- mfre
#       |-- fre501
#       |-- fre502
#       |-- fre516
#       |-- fre528
#           |-- lectures
#           |-- labs
#               |-- reg_houses.R
#               |-- data
#                   |-- vancouver_prices.csv
#               |-- mfre.Rproj
```

- Let's say that you saved the csv file inside a data folder within the labs folder, then your code should be

```
read_csv(here("fre528", "labs",  
              "data", "vancouver_prices.csv"))
```

Practice, practice, practice

- It may be a bit confusing at first, but with practice and good file organization, using R Projects and `here()` function will make sense!

Recap

- Using R Projects and the `here()` function will facilitate easier code collaboration and organize your workflow.
- Create an `mfre` folder in your Desktop and one folder for each course. After downloading any file from Canvas, make sure you move that file to the relevant course folder.
- Create an R Project for each of your MFRE courses.
- Open this R Project before creating/opening any script.
- Use `here()` for file paths.

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mfre.landfood.ubc.ca
