PP4RS | R Module

Slot 3

Dora Simon

06.09.2018

Outline of the R-Module

Slot 1: Intro & Data Types

Slot 2: Conditionals and Functions & Loops

Slot 3: Read in Data

Slot 4: Data Manipulation

Slot 5: Regressions

Slot 6: Graphs

Slot 7: knitR

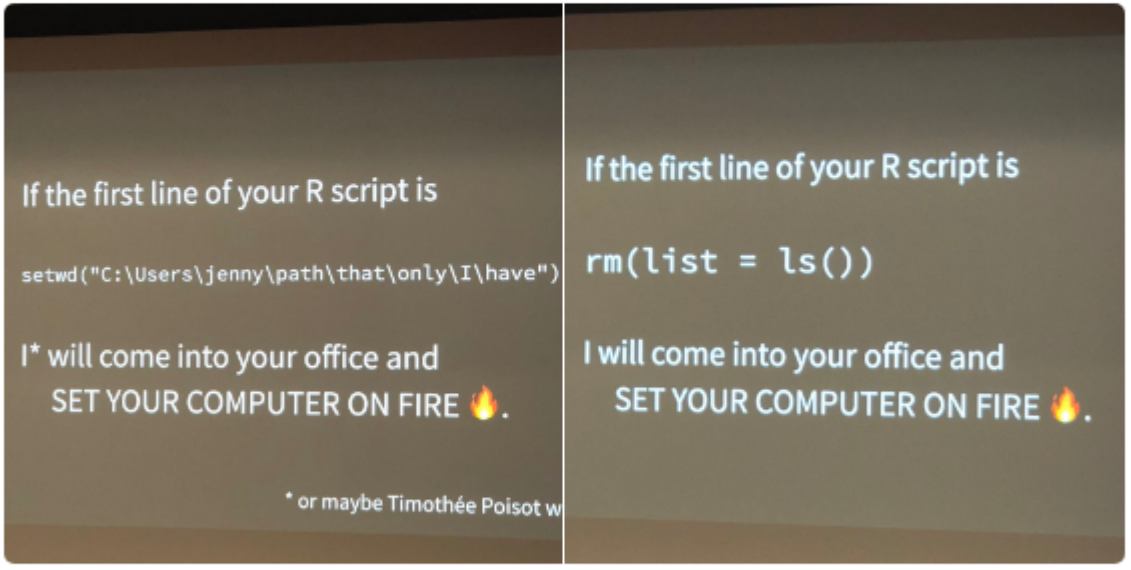
Now: Read in Data

Workflow in R

Hadley Wickham
@hadleywickham

Follow

The only two things that make @JennyBryan 😤😠🤯. Instead use projects + here::here() #rstats



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The chance this `setwd()` will work for anyone besides the author is 0.

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[1] All credit goes here

The here function

The `here` function creates paths relative to the top-level directory.

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How you usually use a function that requires a path

```
somefct("~/git/teaching/pp4rs/2018-uzh-course-material/
        14-r-data-manipulation/some-data.csv")

# Or if you have specified your path above:

somefct("./14-r-data-manipulation/some-data.csv")
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# Or if you have specified your path above:

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```

How the `here` function helps

```
library(here)

somefct(some-argument, here("14-r-data-manipulation"))
```

RProjects

> RStudio projects make it straightforward to divide your work into multiple contexts, each with their own working directory, workspace, history, and source documents.

Projects provide an alternative to the usage of the `here` function.

Look at this short video to understand what Projects are in R:

Video

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What about objects that take a long time to create?

- Save & reload with `saveRDS()`
- Use Snakemake!

Read in Data

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Excel and Stata's .dta

- `read_excel` from the `readxl` package
- `read_dta` from the `haven` package

Parsing

Sometimes, columns do not have the correct format.

In that case, you want to parse them correctly. The `readr` package helps there.

- `parse_character()`
- `parse_number()`
- `parse_date(), parse_datetime()`

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- `parse_date(), parse_datetime()`

R uses 'UTF-8' for character encoding

- Parsing characters might be problematic if your data is in a different character encoding format
- More about character encodings here

Saving data sets

- `saveRDS` and `readRDS` for one file

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Data files in R:

- `rda` is short for `RData` and comes from the `save` family
- `rds` stores a single R object

[1] Read more a bout the difference between `save` and `saveRDS` here and here

Exercises

1. Read in `simons.csv` from the course material folders using the `readr` package and print the table. (hint: Use the `here` function to have the right path.)
2. Define a new variable `age2` that is parsed as a number. Define a new variable `height2` that is parsed as a number as well and gives the height in meters (not centimeters). Then, print your data frame.
3. Write a conditional that checks whether a folder for your clean data exists. If not, it creates a new folder. (hint: use `if`, `file.exists` and `dir.create`)
4. Write your dataset into an .rds file in your new clean data folder.

Solutions

Read in simons.csv from your copy of the course material folder number 15 using the `readr` package and print the table. (hint: Use the `here` function to have the right path.) Do not do it from the real course material folders because it might mess up your git pull.

Solutions

Read in simons.csv from your copy of the course material folder number 15 using the `readr` package and print the table. (hint: Use the `here` function to have the right path.) Do not do it from the real course material folders because it might mess up your git pull.

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If you don't like the way R displays the date, you can format it.[1<\sup>]

[1] You can find more about formatting dates here.

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```
excel_dates <- c(0, 1)

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mac_dates<-as.Date(excel_dates, origin="1904-01-01")

windows_dates
```

```
## [1] "1899-12-30" "1899-12-31"
```

```
mac_dates
```

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> Und was ist die Moral von der Geschicht'?
>
> Nutze Microsoft Excel nicht![1]

[1] Quote from this person.

Data Transformations

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Is very fast, as many key operations are coded in C++

dplyr functions

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There is also a handy `print` method that prevents you from printing a lot of data to the console.

How to use dplyr functions

- The first argument is a data frame
- The subsequent arguments describe what to do with it
- You can refer to columns in the data frame directly without using the $ operator (just use the names)
- The result is a new data frame

Aside

You can do the same operation with many types of functions.

```
my_data<-iris #this is some inbuilt data on flowers
head(my_data)
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5          1.4         0.2  setosa
## 2          4.9         3.0          1.4         0.2  setosa
## 3          4.7         3.2          1.3         0.2  setosa
## 4          4.6         3.1          1.5         0.2  setosa
## 5          5.0         3.6          1.4         0.2  setosa
## 6          5.4         3.9          1.7         0.4  setosa
```

Aside

Imagine you want to select the first two columns from a dataset.

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library(dplyr)
head(select(my_data, Sepal.Length, Sepal.Width))
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```

```
head(my_data[,1:2])
```

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## 6          5.4         3.9
```

Exercises

1. The `Ecdat` package contains datasets for economics. Load it and define `affairs<-as_data_frame(Fair)`. It contains a cross-section of 601 individuals in the United States, some of their characteristics and how many extramarital affairs they had in the past year. Have a look at the data using a command of your choice. You can find a data description is two slides ahead.
2. Show only entries for women.
3. Show only entries for very religious, childless women who had at least one affair and save the result in a new dataset. Then, delete the dataset.
4. Create a new dataset consisting only of the variables `sex`, `age`, `nbaffairs` and save it.
5. Rename the variable `nbaffairs` into `headcount` in your new dataset.
6. Keep all variables of your new dataset except `sex`.
7. Create a variable to capture the age at which a person got married
8. Order the data frame `affairs` so that you first have the women from old to young and at the end the men from old to young. (hint: use the `dplyr`package and the function `desc`)

Solutions

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Solutions

As you can see, the dataframe contains 9 variables.

- **sex**: factor: male or female
- **age**: age in years
- **ym**: number of years married
- **child**: factor: yes or no?
- **religious**: How religious from 1 (anti) to 5 (very)?
- **education**: education in years
- **occupation**: occupation, from 1 to 7, according to hollingshead classification
- **rate**: self rating of marriage, from 1 (very unhappy) to 5 (very happy)
- **nbaffairs**: number of affairs in past year

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Solutions

Let's check the top of the dataset.

Solutions

And let's see the bottom of the dataset.