Welcome to R

Luis Francisco Gómez López

FAEDIS

2024-07-30
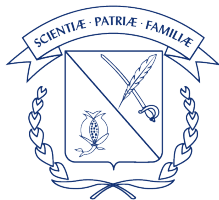
Table of contents I

Table of contents II

- This presentation is based on (Chapman and Feit 2019, chap. 1)

- Deliver essential knowledge within a minimal timeframe by employing hands-on learning techniques to enhance productivity in the R programming language

- **Learning and forgetting curves** (PBC 2023)
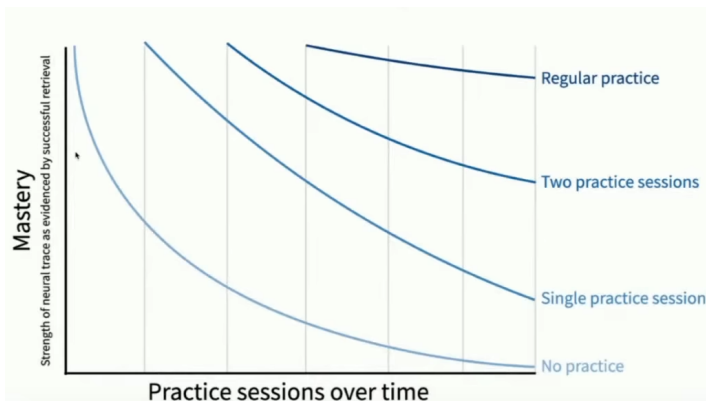
Figure 1: Learning and forgetting curves

- **Practicing and forgetting curves** (PBC 2023)
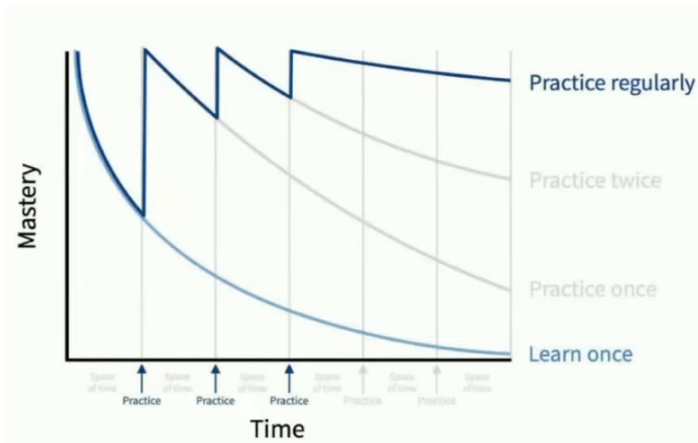
Figure 2: Practicing and forgetting curves

- **What are R and RStudio IDE?** (Ismay and Kim 2020, chap. 1)

(a) R: Engine

(b) RStudio IDE: Dashboard

Figure 3: Analogy of difference between R and RStudio

- **What is Quarto?**
  - Open-source scientific and technical publishing system
  - It is possible to integrate prose, code and results via Rstudio IDE (Wickham, Çetinkaya-Rundel, and Grolemund 2023, chap. 29)


Figure 4: Quarto workflow

- **Download and install R**: https://cloud.r-project.org/
  - Download R for Linux (Debian, Fedora/Redhat, Ubuntu)
  - Download R for macOS
  - Download R for Windows

- **Download and install RStudio IDE**:
  https://posit.co/download/rstudio-desktop/
    - Windows 10/11
    - macOS 11+
    - Ubuntu 18/Debian 10, Ubuntu 20/Debian 11, Ubuntu 22, Fedora 19/Red Hat 7, OpenSUSE 15, Fedora 34/Red Hat 8, Fedora 36/Red Hat 9

- **Download and install Quarto**:
  https://quarto.org/docs/get-started/

  - Ubuntu 18+/Debian 10+, Linux Arm64
  - Mac OS
  - Windows

- **Nothing works help me!!!**

  - Don't worry posit get you cover!!!

  - Use posit Cloud: https://posit.cloud/

    - Sign Up > Cloud Free > Sign Up

- **Using R and Quarto via RStudio IDE** (Ismay and Kim 2020, chap. 1)

  - Don't worry about Quarto because it will be embedded in RStudio IDE
    - If you are using posit Cloud don't worry about anything!!!

(a) R: Do not open this

(b) RStudio IDE: Open this

Figure 5: R versus RStudio IDE icons on your computer

- **What are R packages?** (Ismay and Kim 2020, chap. 1)

(a) R: A new phone

(b) R packages: Apps you can download

Figure 6: Analogy of R vs R packages

R packages

- **Installing the tidyverse as an example**

    - Copy and paste this code in the console. If you have already installed
      the tidyverse nothing will happen but if you don't have installed the
      tidyverse then the package is going to be installed

    - Installing a package is like downloading an app from a store where you
      need to do it only once

```
packages <- c("tidyverse")
for (package in packages) {
  if (!(package %in% rownames(installed.packages()))) {
    install.packages(package)
  }
}
```

- **Loading a package**

    - Loading a package is like opening an app you already installed on your
      phone where you need to do it every time you want to use the app

```
library(tidyverse)
```

- **Error**: Generally when there's an error, the code will not run and a message will try to explain what went wrong (Ismay and Kim 2020, chap. 1)

```
x <- c(1, 2, 3, 4, 5)
X
```

```
Error in eval(expr, envir, enclos): object 'X' not found
```

- **Warning**: Generally your code will still work, but with some caveats (Ismay and Kim 2020, chap. 1)

```
sqrt(-9)
```

```
Warning in sqrt(-9): NaNs produced

[1] NaN
```

- **Message**: it's just a friendly message (Ismay and Kim 2020, chap. 1)

  - Read it, wave back at R, and thank it for talking to you (Ismay and Kim 2020, chap. 1)

```
packages<-c("tidyverse")
for(package in packages) {
  if(!(package %in% rownames(installed.packages()))) {
    install.packages(package)
  }
}
library(tidyverse)
```

```
-- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
v dplyr     1.1.4      v readr     2.1.5
v forcats   1.0.0      v stringr   1.5.1
v ggplot2   3.5.1      v tibble    3.2.1
v lubridate 1.9.3      v tidyr     1.3.1
v purrr     1.0.2
-- Conflicts ----------------------------------------- tidyverse_conflicts() --
x dplyr::filter() masks stats::filter()
x dplyr::lag()    masks stats::lag()
i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

- **Download from UMNG Springer Link database**:
    - https://doi-org.ezproxy.umng.edu.co/10.1007/978-3-030-14316-9
- **Check the book site**:
    - http://r-marketing.r-forge.r-project.org

- To my family that supports me

- To the taxpayers of Colombia and the **UMNG students** who pay my salary

- To the **Business Science** and **R4DS Online Learning** communities where I learn **R** and π-**thon**

- To the **R Core Team**, the creators of **RStudio IDE**, **Quarto** and the authors and maintainers of the packages **tidyverse** and **tinytex** for allowing me to access these tools without paying for a license

- To the **Linux kernel community** for allowing me the possibility to use some **Linux distributions** as my main **OS** without paying for a license

References I

Chapman, Chris, and Elea McDonnell Feit. 2019. *R For Marketing Research and Analytics*. 2nd ed. 2019. Use R! Cham: Springer International Publishing : Imprint: Springer. https://doi.org/10.1007/978-3-030-14316-9.

Ismay, Chester, and Albert Young-Sun Kim. 2020. *Statistical Inference via Data Science: A ModernDive into R and the Tidyverse*. The R Series. Boca Raton London New York: CRC Press, Taylor & Francis Group. https://moderndive.com/index.html.

PBC, Posit. 2023. "Learning Python for Data Science with Posit Academy - YouTube." https://www.youtube.com/live/IpUhSZPqTaE?feature=share&t=401.

Wickham, Hadley, Mine Çetinkaya-Rundel, and Garret Grolemund. 2023. "R for Data Science (2e)." https://r4ds.hadley.nz/.