Slides available at: ducoveen.com

Acknowledgements

THIS PRESENTATION COULD NOT BE DONE WITHOUT OTHERS

Part of the materials I present are developed by Gerko Vink for the R summerschool course at Utrecht University.

The tutorial I will walk you through has been developed Ihnwhi Heo in collaboration with Rens van de Schoot and myself.

I will distribute a list with materials you can use to learn R further, this is based on work by Laurent Smeets.

Program

- What is the difference between R and RStudio?
- Why use R and RStudio?
- How to install them?
- Getting started, walkthrough a tutorial together
- What to do when you get stuck
- Materials you can use to practice with

What to expect today

- Brief introduction in R/Rstudio
- Showcase:
  - Loading in Data
  - How easy analyses can be with R
- Tips to start learning

What **not** to expect today

- Full programming course
  - E.g. writing functions
- Complete overview of R
- Understanding how everything works / not getting stuck

Goal of today

- Goal is to get you up and running and to start playing with R
- We provide some materials you can look at if you want
- Q&A in 3 weeks
  - We intend to do this more often but this is what is planned now

The origin of R

- R is a language and environment for statistical computing and for graphics
- GNU project (100% free software)
- Managed by the R Foundation for Statistical Computing, Vienna, Austria.
- Community-driven
- Based on the object-oriented language S (1975)

RStudio

Integrated Development Environment

- Aggregates all convenient information and procedures into one single place
- Allows you to work in projects
- Manages your code with highlighting
- Gives extra functionality (Shiny, knitr, markdown, LaTeX)
- Allows for integration with version control routines, such as Git.

Why use R/RStudio

- It’s good software!
- It’s also free, so no more expensive licences.
- Open Source
- Community based
- Continuously developed

How to install them?

R:

- https://cran.r-project.org/

RStudio (desktop):

- https://rstudio.com/products/rstudio/

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Walkthrough tutorial

https://www.rensvandeschoot.com/tutorials/r-for-beginners/

By: Ihnwhi Heo, Duco Veen, and Rens van de Schoot

Dataset example on antisocial behaviour

What you need to know

Objects and elements

- R works with objects that consist of elements. The smallest elements are numbers and characters. (remember str(popular_regr_1)?)
  - These elements are assigned to objects.
    - By means of "<-", e.g. "a <- 100"
  - A set of objects can be used to perform calculations
    - "a * b"

What you need to know

- R is CaSe SenSiTive
  - Fit ≠ fit, A ≠ a
- Calling an object: “a”

```
> a
[1] 100
```

What you need to know

Objects and elements

- Calculations can be presented as functions
  - E.g. “lm()”, “t.test()”
- Functions are used to perform calculations and return new objects, containing calculated (or estimated) elements.
  - Which can be stored “fit <- lm(…)”

What you need to know

Packages

- An R package is a collection of functions, data, and documentation that extends the capabilities of base R[*, **]

What to do when you get stuck

- Google
  - use ‘R:’ as a prefix in your search term

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What to do when you get stuck

- Use ?, ??, and the Help tab
- Stack Exchange
  - a collection or a network of websites for questions and answers for diverse topics.
- Stack Overflow
  - Stack Overflow is geared for programming, coding, packages, and functions. In other words, you can find and ask for anything relevant to your statistics within R.

What to do when you get stuck

- Google
  - use ‘R:’ as a prefix in your search term
- https://rstudio.com/resources/cheatsheets/
  - Look for Base R for now

Materials you can use to practice with

- Tutorial we walked through + installing R/RStudio:
  - https://www.rensvandeschoot.com/tutorials/r-for-beginners/
  - More tutorials: https://www.rensvandeschoot.com/tutorials/
- Hands-On Programming with R
  - For non-programmers
  - https://rstudio-education.github.io/hopr/
- R for Data Science
  - Free book by Hadley Wickham, one of R's most influential contributors
  - https://r4ds.had.co.nz/

If we have some time left

- Any questions / comments?
- Simple operations example, how R is organized