

An introduction to R **EPFL** for Environmental Sciences and Ecology



Session 4 – 17.03.2022

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Fundamentals in Ecology

Bachelor 2 SIE – Sciences et Ingénierie de l'Environnement

Fundamentals of Ecology Introduction to R Overview

Aim of the course



At the end of our R course you are able to:

- Write and debug your own code in RStudio
- Apply RStudio for basic data transformation, reading in and writing out
- Create and export nice figures
- Use R for basic statistical analyses

Why use R?

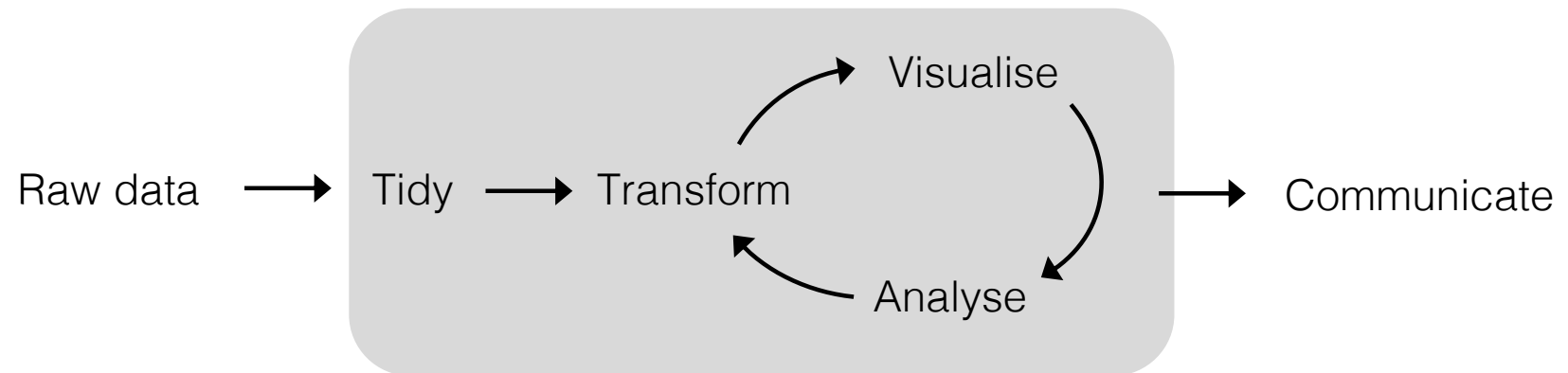
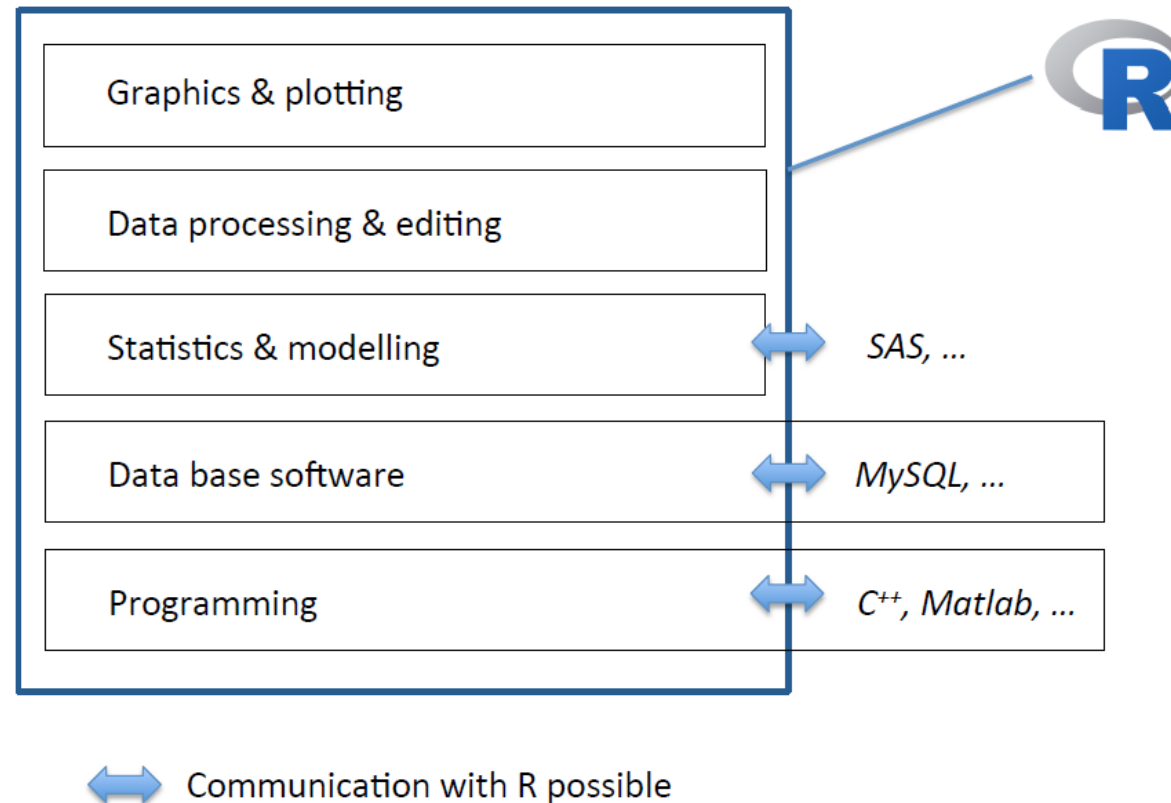


Figure adapted from: "R for Data Science" book

Why use R?

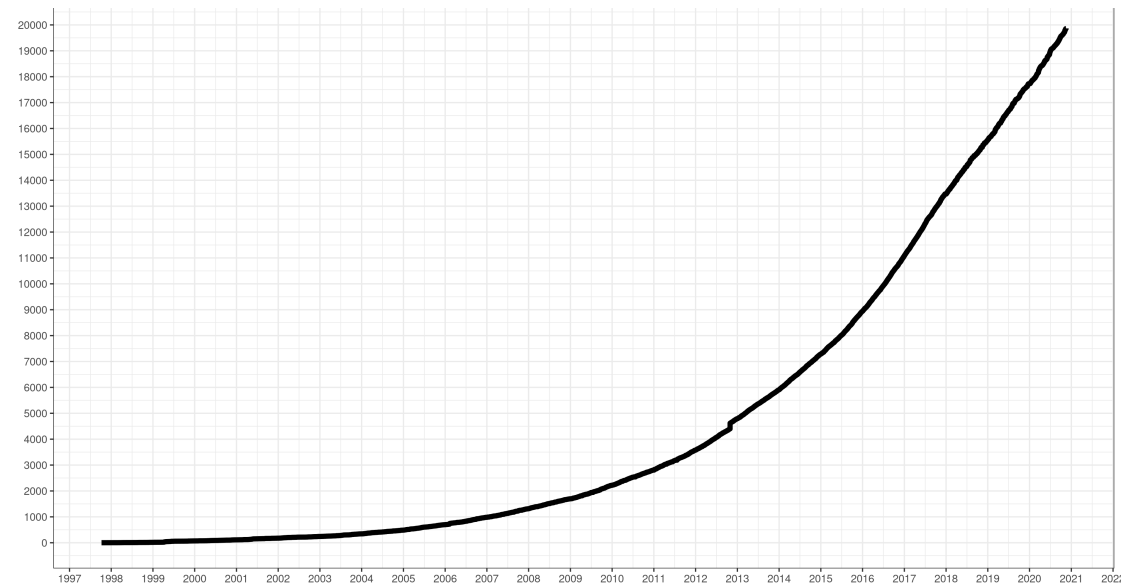


Why use R?

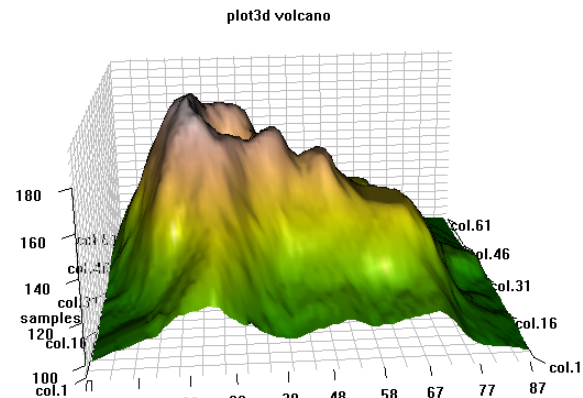
R packages



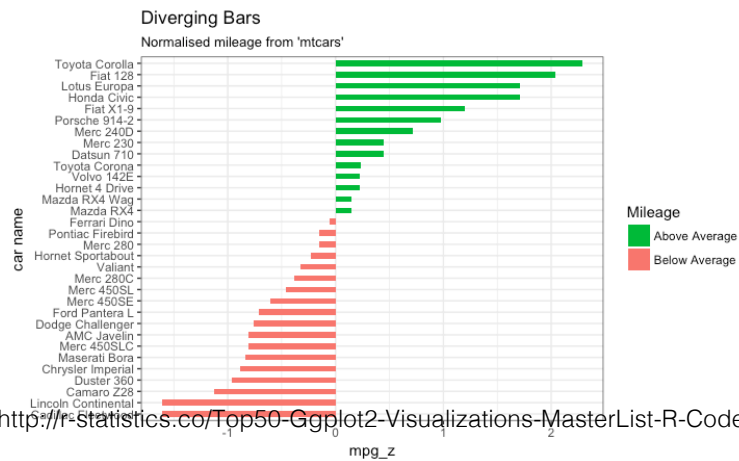
Number of R packages



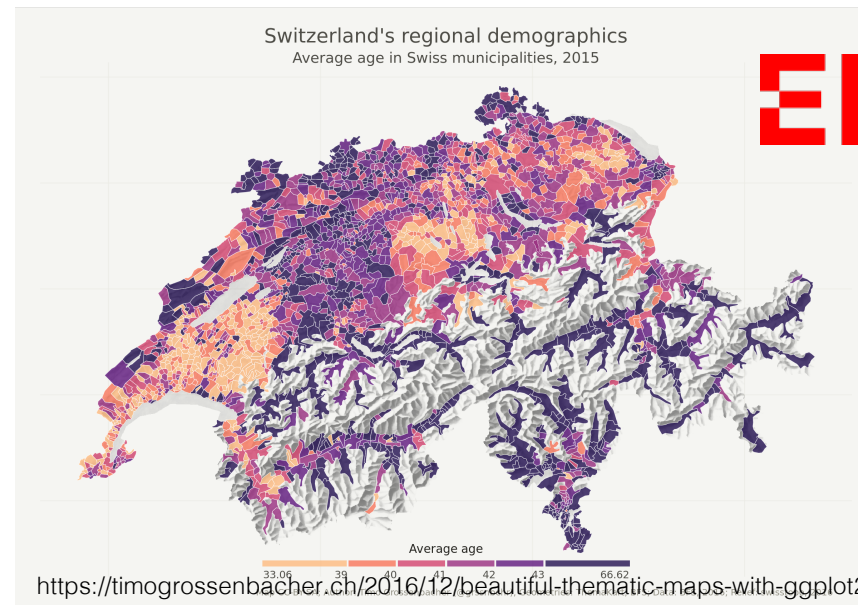
Why use R?



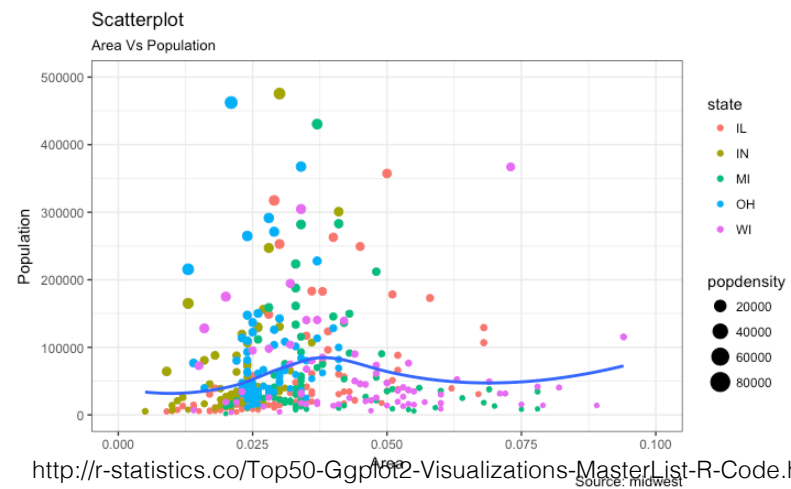
<https://stackoverflow.com/questions/41150858>



<http://r-statistics.co/Top50-Ggplot2-Visualizations-MasterList-R-Code.html>



<https://timogrossenbacher.ch/2016/12/beautiful-thematic-maps-with-ggplot2-only/>



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EPFL

Coding in R

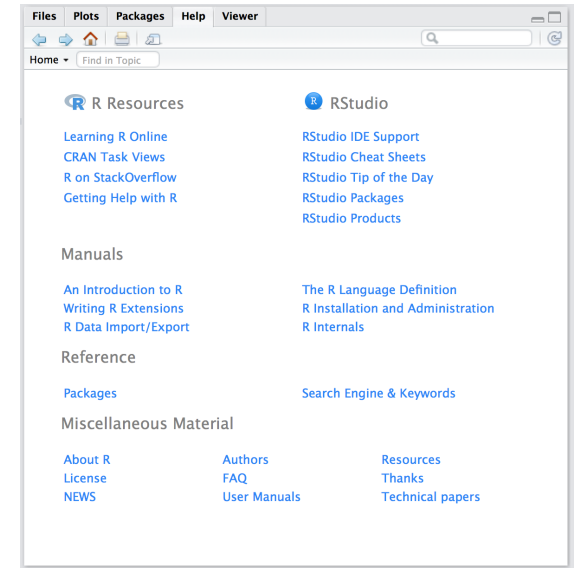
Challenges

- Learning a new syntax
- The built-in R help is not very helpful and difficult to understand
- Many functions in many packages, difficult to memorise

Mindset and practical advices

- Frustration is and will remain part of the process
- Ask questions, work in teams, get inputs
- There's huge online help for almost all problems
- Use cheat sheets, create your own cheat sheets
- There are many different roads that lead to the objective
- Let the problem rest for a while, sometimes the solutions comes next day

Built-in help



Online help: Stack overflow



Course overview

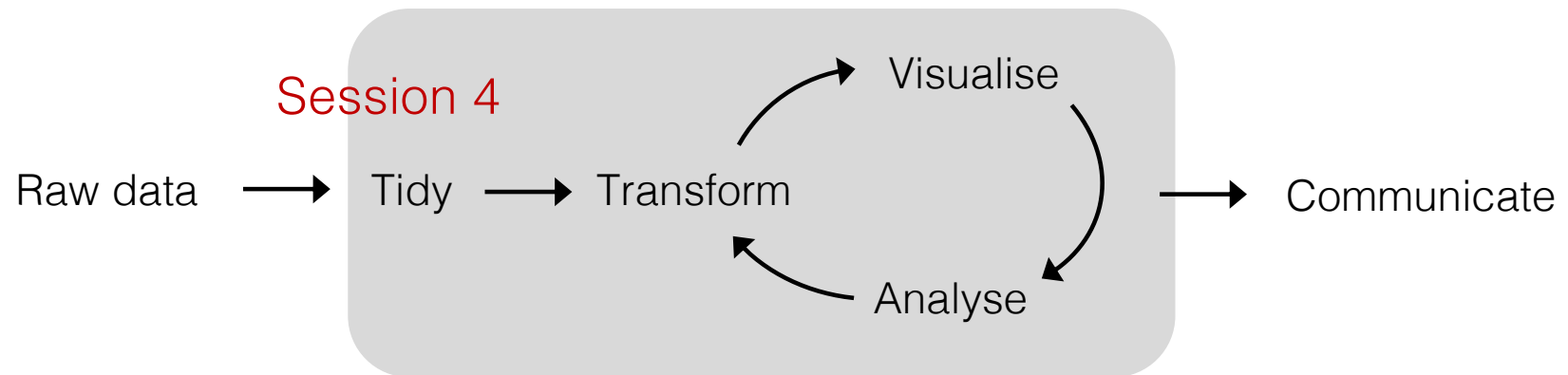


Figure adapted from: "R for Data Science" book

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Introduction to the R environment, basic operations and data manipulation

Course overview

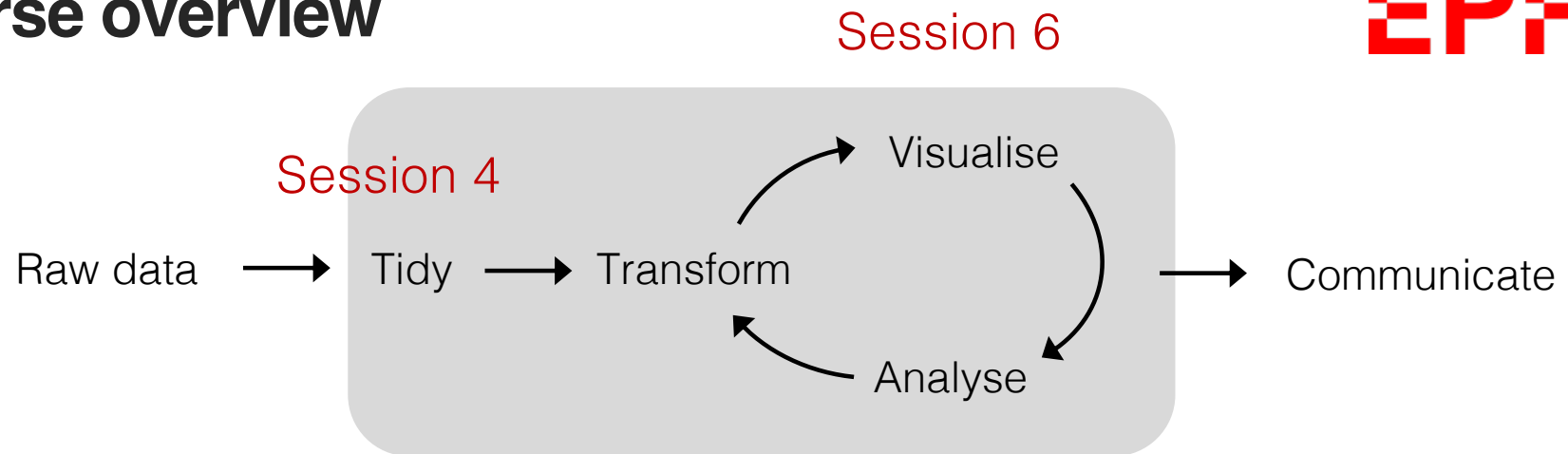


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Introduction to the R environment, basic operations and data manipulation

Session 6, 31.03.2022

Visualisation of data using R

Course overview

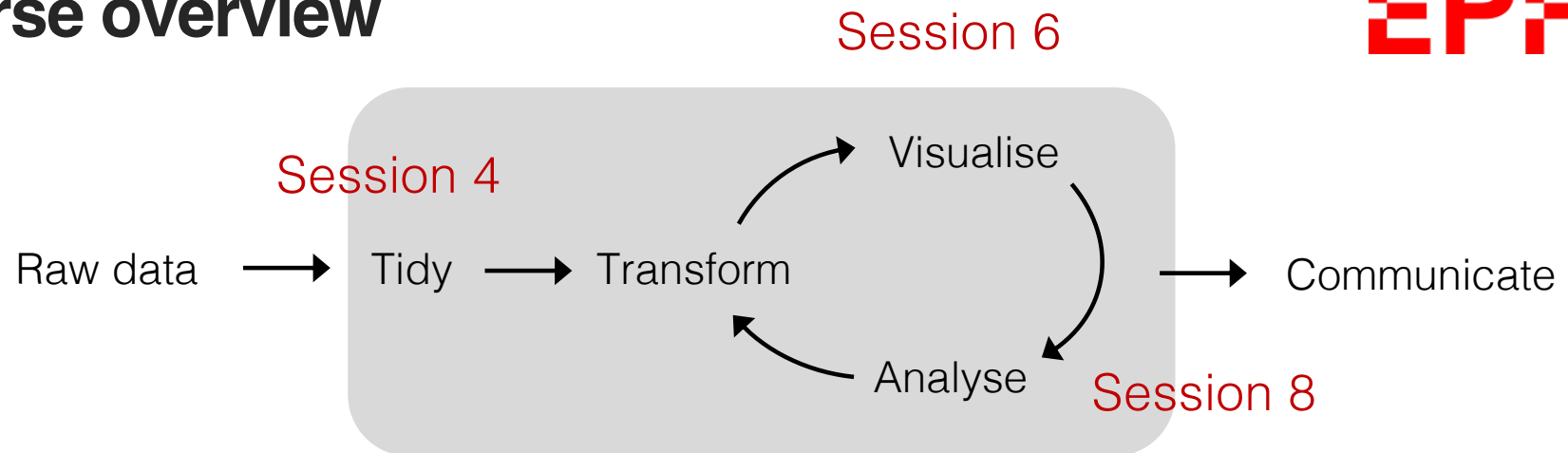


Figure adapted from: "R for Data Science" book

Session 4, 17.03.2022

Introduction to the R environment, basic operations and data manipulation

Session 6, 31.03.2022

Visualisation of data using R

Session 8, 14.4.2022

Statistical analyses with R

Session 4 Overview



1. Video input: How does an R session look like? How does RStudio work?
2. Self-learning
 - Do calculations
 - Understand object classes
 - Read in data
 - Apply functions
 - Manipulate vectors
 - Manipulate dataframes
 - Write out data
3. Do the exercises on moodle until 16.3.2022
4. Meet in lecture room for questions and answers on 17.3.2022

Next step

1. Download both R and RStudio here and install it:
<https://stat.ethz.ch/CRAN/>
<https://www.rstudio.com/products/rstudio/download/>
2. Go on moodle and watch the introduction video to RStudio to get started!
3. Find the following important special characters on your keyboard:
 - [] Square brackets
 - { } Curly brackets
 - \$ Dollar key
 - # Hash key
 - ~ Tilde
 - | Vertical bar