Learning Guide

R Data Analysis for Newbies

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Getting Up-To-Speed with R (R for Newbies Part I)

Begin: 11/04/2020   End: 11/04/2020

Learning Module Question

How can I get R working and perform my first analysis?

Learning Outcomes

This one hour workshop (see Multimedia links for a recording) cannot provide a complete introduction to R.

However, it will get everybody to a level to perform a first Analysis with R - the Hello World Analysis in R.

Topics include:

- Installing R and RStudio
- Tips and Tricks for RStudio
- Importing data from Excel
- Data wrangling with the tidyverse
- Commonly used statistical analysis tools
- Reporting of analysis results (more details in part II)

Multimedia Resources

- **Download R here**
  Install R before you install R Studio
- **Rstudio Download**
  Download Rstudio here. Make sure R is installed before you download Rstudio!
- **How to Install and Load the Tidyverse package**
  The tidyverse package installs several packages and its pacckages are needed for almost all R applications. The 1 minute video shows how to install and load the tidyverse package.
- **Import Excel to R**
  This video shows how to work with Excel files in R
- **Free Datacamp R Course**
  This course introduces R from the start. It is an interactive course with exercises.
- **Recording of the Workshop**
  This is a video recording of the workshop "R Data Analysis for Newbies Part I"
- **R Script Used During the Workshop**
  Here is the R script that was used during the workshop.

  You might want to use this script while watching the video.

- **Excel Dataset Used During the Workshop**
  Here you can downlaod an Excel file with the dataset that was imported into R and used during the workshop.

Literature

- **Torres-Reyna, Oscar, Introduction to R Studio, Princeton Training,:**
  Excelent intro to Rstudio (you can skip the more advanced topics towards the end)
  https://dss.princeton.edu/training/RStudio101.pdf

- **Michonneau , Francois, Fournier, Auriel, Data Analysis and Visualization in R for Ecologists. Datacarpentry free version: :**
  Online tutorial for R (good as a start)
  https://www.cpp.edu/~clange/RData/RTutorial/index.html
- **Wickham, H., Grolemund, G., R or Data Science, O Reilly, 2016.:**
  Ch 4, 5, 6, (3), covers functions to organize data (e.g. with select(), filter(), mutate())
  http://r4ds.had.co.nz/
- **Yau, Chi, R Tutorial. An R Introduction to Statistics. Free online version::**
  Ch. 1 provides an excelent R introduction.
  https://www.r-tutor.com

Data Analysis and Reporting (R for Newbies Part II)

Begin: 03/23/2021   End: 03/23/2021

Learning Module Question

How can I include my analysis into an academic article, a book, or thesis?

Learning Outcomes

This one hour workshop (see Multimedia links for a recording) is Part II of the R for Newbies series.

We will proceed in two steps:

1. We will create a R script with a basic data analysis.

2. We will create a book/article that integrates the analysis. The book includes:

- Equations
- Tables
- Figures
- Dynamic references to equations, figures and tables
- R code from our data analysis including the results
- Literature references and citation.

Multimedia Resources

- **Recording of the Workshop**
  This is a video recording of the workshop "R Data Analysis for Newbies Part II"
- **R Script Used During the Workshop**
  Here is the R script that was used during the workshop.

  You might want to use this script while watching the video.

- **Excel Dataset Used During the Workshop**
  Here you can downlaod an Excel file with the dataset that was imported into R and used during the workshop.
- **Sample Book Code**
  Here you can downlaod the folder (as a Zip) with all the code for the sample book. This folder can be used as a starting point for your own book.
- **Book Code from Workshop**
  Here you can downlaod the folder (as a Zip) with all the code for the book developed during the workshop. This folder can be used as a starting point for your own book. It has a little more funtionality than the sample book folder but the sample folder is simpler. So, it is probably best to start with the sample book and then go to the workshop book.
- **JabRef Database**
  The JabRef database program can be used to create and organize leterature references for the book.bib file. JbRef is free, comprehensive, and is easy to use.

Literature

- **Xie, Yihui, bookdown: Authoring Books and Technical Documents with R Markdown, Chapman and Hall/CRC, 2016.:**

Fee online book written in R-MarkDown available at:
https://bookdown.org/yihui/bookdown/

R From Start to Finish in 60 Minutes (September 29th, 2021)

Begin: 09/29/2021   End: 09/29/2021

Learning Module Question

From Installation to Data Engineering, to Model Building with the Tidyverse and Tidymodelsent with Tidymodels

Learning Outcomes

The module overlaps with the other two modules. The new pat is how to develop models with Workflows/Tidymodels.

The modue covers

- how to use R and RStudio starting with how to install the programs,
- how to load data from Excel,
- how to process data with the tidyverse package,
- how to perform data engineering with recopies from the tidy model package, and it provides a short example how to use workflow from the tidymodels package to combine models, recipes and data.

Multimedia Resources

- **Video from the Workshop**

   The video from the workshop is available on YouTube. It has a table of content. Ths allows you to skip to the part you like to review.

- **R Script, Data, and Presentation Organized in a Zip File**

   The linked Zip file contains materials from the workshop. Extract the contents of the Zip file to a folder. Than use RStudio to open the project that is contained in the folder.

- **Presentation Slides from the Workshop**

   Here is are the slides from the workshop in HTML format.

   Note, the third slide has various links to content that was discussed during the workshop.

Literature

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