REM Tutorial 1: Introduction to R

Prof. Dr. Kathleen Kürschner Rauck

AT 2023

Organisation I

- **Speaking hour:** on appointment
  (kathleen.kuerschner@unisg.ch)
  Swiss Institute of Banking and Finance, Unterer Graben 21,
  Office 51-4017
- **Grading:**
  - **4 R assignments** distributed via Canvas throughout semester
    $\Rightarrow$ **each contributes 10 % to final grade**
  - (Minimum) 2 weeks processing time per assignment
  - **Submit electronic solutions in .html format via Canvas**
    (see Tutorial 2)
  - Preliminary **deadlines at 23:59pm (Zurich time)**:
    23/10/2023, 11/11/2023, 04/12/2023, 22/12/2023

Organisation II

- **Agenda:** bi-weekly R tutorials on Mondays, 2:15-4:00pm, 01-U126
  - I. Introduction to R (25/09/23)
  - II. RMarkdown, Descriptive Statistics & Maps (09/10/23)
  - III. Regression I - Hedonic (23/10/23)
  - IV. Regression II - Panel (20/11/23)
  - V. Regression III - Spatial (04/12/23)
  - (VI.) Guest lecture (18/12/23)
- **Materials on Canvas:**
  - Problem set (by Thursday before class)
  - Workbook (by Sunday before class)
  - Slides, potentially with follow-up/remarks (after class)
  - Assignments (after prerequisites covered in class)

Mode of Instruction

- **Presentation:** agenda, important libraries, commands & miscellaneous
- **Practice:** work in small groups (or individually) through workbook (uploaded a day before class)
- (Integrated break: take short breaks as required during the practical)
- **Recap & wrapping up:** additional tweaks & remarks on code, outlook

Getting Started I

- We will be working with R and RStudio in the practicals.
- **R** is an open source programming language, used for statistical programming and to produce graphics.
- **RStudio** is an integrated development environment (IDE) for R, i.e., a companion to R language $\rightarrow$ provides accessible user interface.
- Mostly, think in terms of vectors and matrices when communicating with your PC using R language.

Example of R language & built-in function:

```
one plus one
```

```
Error: unexpected symbol in "one plus"
```

Enter instead:

```
1 + 1
```

```
## [1] 2
```

Getting Started II

i. Organise your work space (create working folder, store data sets, etc.)

ii. Set working directory to working folder

iii. Set up R Script and save to working folder

iv. Install packages (done once per machine): `install.packages("")`

v. Load packages (done once per session): `library()`

vi. Get help/further information on packages and functions: `?NAMEofPACKAGE`
(or go to: https://rdocumentation.org)

Today's Agenda

Learning Outcomes	R Functions	Libraries	Data
Understand what R and RStudio is			
Know (some) fundamentals of the R language			
Be able to set (change) your working directory in R			
Be able to use R to download financial data	`getSymbols()`	`quantmod`	Yahoo finance
Know how to plot financial data using R	`chartSeries()`		
Be able to use R to download & plot house price data	`plot()`		FRED
Know how to handle and index data in R	`c()`; `class()`		
	`as.numeric()`		
	`rnorm()`		
Know how to generate and handle data frames in R	`data.frame()`		
	`paste()`		
Know how to load data in R	`read.table()`		ACC_data.txt
	`head()`; `View()`		
	`summary()`		
	`colnames()`		

Practice

Work through **Tutorial 1 - Workbook** to solve the practical problems provided in **Tutorial 1 - Problem Set**.

To do (until next class)

Please read **Chapter 2 (Essentials of the R Language) of the R Book** (Michael J. Crawley (2007): *The R Book*, 2nd ed., John Wiley & Sons.), which is available in the **Files** section on Canvas.