To access the files, first install the package (ignore warning messages about long paths):

library('afedR')

You can copy all book content to a local folder using the following function:

my\_tempdir <- tempdir()

afedR::afedR\_get\_book\_files(path\_to\_copy = my\_tempdir)

The static exercises for all chapters are available in the afedR files/eoc-exercises folder:

list.files(file.path(my\_tempdir, 'afedR files/eoc-exercises/'))

## [1] "afedR-Solutions-Chapter-01-Introduction.Rmd"

## [2] "afedR-Solutions-Chapter-02-Basic Operations.Rmd"

## [3] "afedR-Solutions-Chapter-03-Writing-Research-Scripts.Rmd"

## [4] "afedR-Solutions-Chapter-04-Importing-Exporting-Local-Files.Rmd"

## [5] "afedR-Solutions-Chapter-05-Importing-Data-Internet.Rmd"

## [6] "afedR-Solutions-Chapter-06-Dataframes-and-others.Rmd"

## [7] "afedR-Solutions-Chapter-07-Basic-Classes.Rmd"

## [8] "afedR-Solutions-Chapter-08-Programming-with-R.Rmd"

## [9] "afedR-Solutions-Chapter-09-Cleaning-Structuring-Data.Rmd"

## [10] "afedR-Solutions-Chapter-10-Figures.Rmd"

## [11] "afedR-Solutions-Chapter-11-Financial-Econometrics.Rmd"

## [12] "afedR-Solutions-Chapter-12-Reporting-Results.Rmd"

## [13] "afedR-Solutions-Chapter-13-Optimizing-Code.Rmd"

Every .Rmd file is self-contained and should compile without any problems in your computer.

Now, the real benefit of the package is in the **dynamic R exercises** you can create with package exams. In short, you can use exams to create an unique version of a exercise for each student by randomizing numbers and text. All questions are written in .Rmd/.Rnw files and, since its all RMarkdown code, you can make it as dynamic as possible. The amount of hours it saved me so far in creating and grading exams is unbelievable! I even changed the structure of all my classes to a more activity-oriented coursework based on single-choice exercises. The feedback I get from the students has been very positive.

As a result of using exams for many years, I wrote a significant database of R single-choice questions that I use in my university courses. It amounts to 91 questions, covering R basics, functions, class objects, programming, econometrics, and much more.

**Creating a Dynamic Exam**

Creating a dynamic R exam is simple. All you need is the names of all students among other options. Function afedR\_build\_exam will grab all exercise templates, compile each exam, and output a different .html file for each student. Have a look at a reproducible example:

library(afedR)

library(tidyverse)

set.seed(1)

student\_names <- c('Roger Federer', 'John Wick', 'Robert Engle',

'Getulio Vargas', 'Mario Quintana', 'Elis Regina')

my\_ids <- c(sample(seq(length(student\_names)))) # ids (usually a numeric and unique symbol given by the university)

class\_name <- 'R Workshop'

exercise\_name <- 'Introduction to R'

temp\_dir <- file.path(tempdir(), 'html exams') # where to create exam files

l\_out <- afedR\_build\_exam(students\_names = student\_names,

students\_ids = my\_ids,

class\_name = class\_name,

exercise\_name = 'Introduction to R',

chapters\_to\_include = 2, # single chapter for simplicity (it goes from 1-13)

dir\_out = temp\_dir)

## Exams generation initialized.

##

## Output directory: /tmp/Rtmprsh4CX/exams files file29381321d46f

## Exercise directory: /mnt/HDD/Dropbox/11-My Website/www.msperlin.com-blog/content/post

## Supplement directory: /tmp/Rtmprsh4CX/file2938539ecdc8

## Temporary directory: /tmp/Rtmprsh4CX/file29385ddf98d

## Exercises: /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-01-AboutPrint, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-04-AboutTypeFiles, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-05-AboutTypeFiles2, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-06-Sequence, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-08-AboutError2, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-09-About\_ls, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-10-SelectingValues, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-11-AboutDim, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-12-listfiles, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-13-About\_rm, /home/msperlin/R/x86\_64-pc-linux-gnu-library/3.6/afedR/extdata/exam\_files/exercise\_files/Chapter 02 - Basic Operations/Chapter\_02-Intro-14-setwd

##

## Generation of individual exams.

## Exam 1: \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-01-AboutPrint (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-04-AboutTypeFiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-05-AboutTypeFiles2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-06-Sequence (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-08-AboutError2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-09-About\_ls (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-10-SelectingValues (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-11-AboutDim (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-12-listfiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-13-About\_rm (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-14-setwd (srt) ... w ... done.

## Exam 2: \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-01-AboutPrint (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-04-AboutTypeFiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-05-AboutTypeFiles2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-06-Sequence (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-08-AboutError2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-09-About\_ls (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-10-SelectingValues (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-11-AboutDim (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-12-listfiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-13-About\_rm (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-14-setwd (srt) ... w ... done.

## Exam 3: \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-01-AboutPrint (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-04-AboutTypeFiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-05-AboutTypeFiles2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-06-Sequence (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-08-AboutError2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-09-About\_ls (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-10-SelectingValues (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-11-AboutDim (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-12-listfiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-13-About\_rm (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-14-setwd (srt) ... w ... done.

## Exam 4: \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-01-AboutPrint (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-04-AboutTypeFiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-05-AboutTypeFiles2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-06-Sequence (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-08-AboutError2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-09-About\_ls (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-10-SelectingValues (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-11-AboutDim (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-12-listfiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-13-About\_rm (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-14-setwd (srt) ... w ... done.

## Exam 5: \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-01-AboutPrint (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-04-AboutTypeFiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-05-AboutTypeFiles2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-06-Sequence (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-08-AboutError2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-09-About\_ls (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-10-SelectingValues (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-11-AboutDim (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-12-listfiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-13-About\_rm (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-14-setwd (srt) ... w ... done.

## Exam 6: \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-01-AboutPrint (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-04-AboutTypeFiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-05-AboutTypeFiles2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-06-Sequence (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-08-AboutError2 (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-09-About\_ls (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-10-SelectingValues (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-11-AboutDim (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-12-listfiles (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-13-About\_rm (srt) \_home\_msperlin\_R\_x86\_64-pc-linux-gnu-library\_3.6\_afedR\_extdata\_exam\_files\_exercise\_files\_Chapter 02 - Basic Operations\_Chapter\_02-Intro-14-setwd (srt) ... w ... done.

Done. All exams files are available in folder /tmp/Rtmprsh4CX/html exams:

list.files(temp\_dir)

## [1] "Introduction to R\_Elis Regina\_Ver 06.html"

## [2] "Introduction to R\_Getulio Vargas\_Ver 04.html"

## [3] "Introduction to R\_John Wick\_Ver 02.html"

## [4] "Introduction to R\_Mario Quintana\_Ver 05.html"

## [5] "Introduction to R\_Robert Engle\_Ver 03.html"

## [6] "Introduction to R\_Roger Federer\_Ver 01.html"

Going further, the output of afedR\_build\_exam is a list that includes the correct answers for each student/question:

print(l\_out$answer\_key)

## # A tibble: 6 x 13

## i\_name i\_ver `1` `2` `3` `4` `5` `6` `7` `8` `9` `10` `11`

##

## 1 Elis … 6 e e e e e d d d d d d

## 2 Getul… 4 e e e e c a a a a a a

## 3 John … 2 a a a a a a a a a a a

## 4 Mario… 5 a a a a e e e e e e e

## 5 Rober… 3 a a a a e e e e e e e

## 6 Roger… 1 d d d d e a a a a a a