

Exercises for the course
“An introduction to R”

Exercise session Getting started with R: Tuesday - March 3, 2020

Exercise 1: *Literature*

Read the first chapter of 'R in action, 2nd edition' as mentioned in the lecture notes.

Book: <https://www.manning.com/books/r-in-action-second-edition>

Exercise 2: *R as a calculator*

Use R to calculate

$$4^5, \quad \binom{23}{12}, \quad 9!, \quad \sqrt{\pi}.$$

Exercise 3: *It produces faster code and needs less typing to use `sum()` and `prod()` instead of using loops.*

Using the commands `sum()` and `prod()`, calculate

$$\sum_{i=30}^{200} i, \quad \sum_{i=1}^{100} \frac{1}{i}, \quad \sum_{i=0}^{100} i * e^{-i}, \quad \prod_{i=1}^{100} (2 \cdot i^2 - i)$$

Exercise 4: *The most important R command is `help()`. It is good to get used to it as soon as possible.*

The commands `signif()` and `expm1()` have not been discussed in the course. Use `help()` (or ?) to learn how to use them.

- Produce a vector which contains each element of the vector $(1 : 100)^8$ rounded to 3 significant digits. Recall that e.g. 42598 rounded to 3 significant digits is $4.26 * 10^4$.
- For each element x_i of the vector $(10^{-2}, 10^{-3}, 10^{-4}, 10^{-5}, \dots, 10^{-17}, 10^{-18})$ calculate

$$e^{x_i} - 1$$

first by using the R command `exp()` and then by using the R command `expm1()`. Which result do you trust more?

HINT: To create a vector you can use `x <- 1:100` or `x <- c(value1, value2)`