Exercises for the course

"An introduction to R"

Exercise session Getting started with R: Tuesday, February 28 2017

**Exercise 1:** Literature Read the chapter mentioned in the lecture notes.

**Exercise 2:** R as a calculator
Use R to calculate

\[ 3^7, \binom{22}{17}, 8!, \sqrt{\pi}. \]

**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

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

**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 \(4.26 \cdot 10^4\).
- For each element \(x_i\) of the vector \((10^{-2}, 10^{-3}, 10^{-4}, 10^{-5}, \ldots, 10^{-17}, 10^{-18})\) 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 use for example `x <- 1:100` or `x <- c(value1,value2).`