Course "Empirische Bewertung in der Informatik"
Freie Universität Berlin, Institut für Informatik, Arbeitsgruppe Software Engineering
Prof. Dr. Lutz Prechelt, Julia Schenk
Practice sheet 1 SoSe 2014 due on 2014-04-28

Please make sure to always prepare your solutions in a way that you are able to present them to your class mates and discuss your solution process effectively.

Learning aims:

- Getting an understanding of the concept of 'research'.
- Getting to know the most important operators of R and how to use them: arithmetic, comparison, logic links
- Gaining a general understanding of the use of vectors, matrices and lists in R: formation and use in expressions and indexing
- Being able to define and use your own functions
- Being able to use the help function and documentation of R

Task 1-1: (Research Definition)
Find several (at least two) definitions of 'research' from dictionaries, books on research methods and from friends, family or colleagues. What conclusions can your draw about the concept of 'research'? We will compare your definitions and conclusions in the tutorial.

Task 1-2: (learn basic terminology in R)

- **Install R,** (reference version for this course is **3.1.0**).
  - see http://www.r-project.org
  - There is already an installation on the public computer pools (Windows and Linux)
  - **Start** the program by using the commands *Rterm* or *Rgui* (Windows) or *R* (Linux).
- Download the file ***R_intro_session.r*** from the lecture's website. Repeat the execution and **understand** what happens and why.
  - This file contains the commands used in the tutorial's R demo.
  - Use the help function to get more detailed information on the functions and operators used.
  - Be prepared to explain for each command what happens and why (with the exception of the repeated argument's analysis for 'replicate').
  - If necessary read up **background information** in the documents "An Introduction to R" or "The R language definition" which you can find via help.start().
- List three parts in the documentation (in three different documents) which explain the indexing in R.

Task 1-3: (small R task)

Simulate **100000 throws with a dice** and count how often the sequence 3, 4, 5 came up. The expected value is $(100000-(3-1))/6^3$

Use a formulation being suited to R as much as possible (i.e. without explicit loop); not much longer than 2 lines.

For the solution you merely need the functions *sample* and *sum* as well as indexing and operators (there are other solutions as well).