Tutorial for
Introduction to Computational Intelligence in Winter 2015/16

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https://ls11-www.cs.uni-dortmund.de/people/rudolph/teaching/lectures/CI/WS2015-16/lecture.jsp

Sheet 0, Block 0
Due date: none
Discussion: today

22 Oct 2015

Exercise 0.1: Programming
Create an R script (ci1415_0-1.R) that contains a function called customSum that returns the sum of two input variables. Test your function with various data types (numbers, strings, vectors).

Now, add another function (fibonacci(n)) to your script that returns the smallest fibonacci number that is greater than or equal to the input variable n. Test your function with various data types (numbers, strings, vectors).

Exercise 0.2: Matrix operations
Create an R script (ci1415_0-2.R), that saves the multiplication table from 1 to 10 in a matrix. Implement two different methods to compute the table, one using apply and/or similar functions and one without these functions. Comment your script.

What is 4 times 5 according to your table? Print one row of the multiplaction table.

Exercise 0.3: Statistics
Create an R script (ci1415_0-3.R) that calculates mean, median, minimal and maximal values of a random sequence. Test it with different probability distributions (uniform, normal, etc.).

Now download and import the famous iris data set https://archive.ics.uci.edu/ml/datasets/Iris into R. The data originally collected by R.A. Fisher records the sepal length, sepal width, petal length, petal width and class of 150 iris flowers. Add appropriate column names to the data set and use them to calculate the standard deviation of a row. Look at the summary of your data set.

Exercise 0.4: Graphics
Create an R script (ci1516_0-4.R) to recreate the plot in figure 1 as closely as possible. The figure is a plot of the functions $f(x) = \sin(x)$ and $f(x) = \cos(x)$ over the interval $[0, 2\pi]$. The script should export the plot as a pdf file. Comment the script.

Exercise 0.5: Libraries
Have a look at the available third party packages at http://cran.r-project.org/web/packages/available_packages_by_name.html and read help(install.packages) and help(library).

If you want to test installing packages, why not try the RXKCD package that allows you to access XKCD comics directly from R (see https://cran.r-project.org/web/packages/RXKCD/).
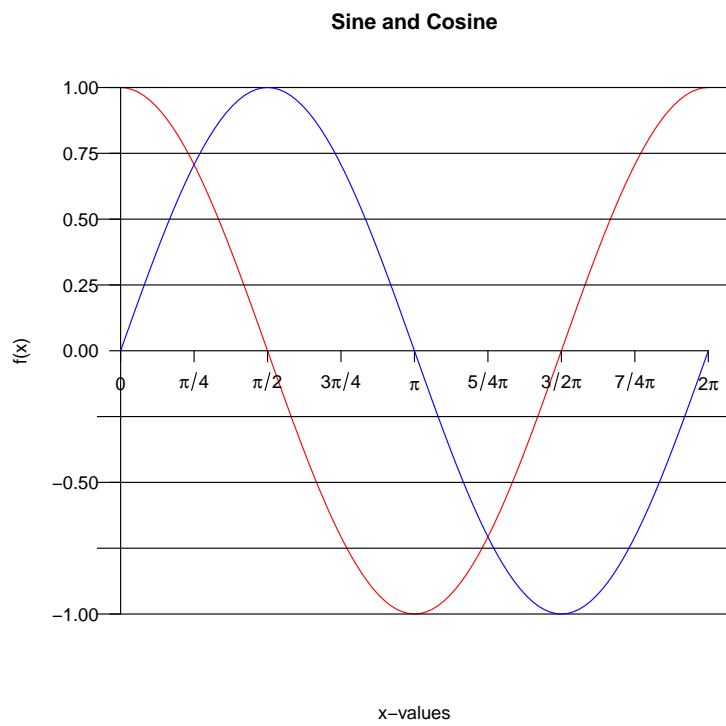
Sine and Cosine

Figure 1: Plot this figure!