

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

22 Oct 2015

Due date: none

Discussion: today

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 multiplication 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. Try it out 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 one to calculate the standard deviation of the corresponding 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

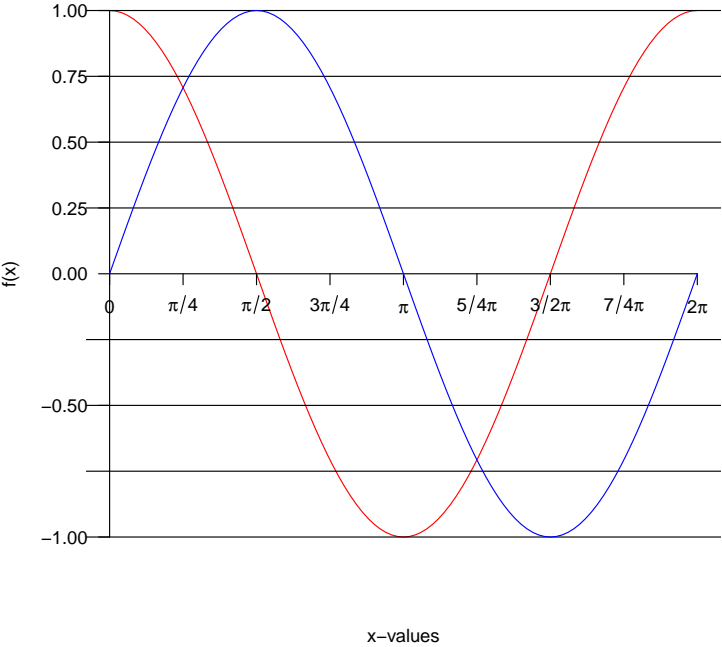


Figure 1: Plot this figure!