

Sheet 1

Topic: Setup

Submission deadline: (nothing to submit this time, but exercises should be completed before 24.04.09)

General Notice

To be admitted to the final exam, every student has to

- attend at least 7 of the exercise sessions in person,
- submit solutions for at least 7 of the exercises, and
- present at least one of the solutions in class.

The exercises should be done in groups of one or two students. Bonus points for the final exam can be collected according to the following rule: Every student

- gets 2 bonus points for each solution presented by herself / himself
- and can collect at most 10 bonus points.

Bonus points will only be granted, if

- the student attends at least 9 of the exercise sessions in person, and
- submits solutions for at least 9 of the exercises.

In general, assignments will be handed out on Tuesdays and have to be submitted electronically the next Tuesday before class.

Exercise 1:

Most of the practical exercises will be required to be solved using *GNU Octave*, a command line program for solving numerical computations. *Octave* is freely available and runs under most Unix and Unix-like operating systems, as well as Microsoft Windows. You'll find all the information you need for this assignment on the Internet.

The first assignment is to install and run *Octave*.

Exercise 2:

Functions in *Octave* are usually defined in external files where they can be easily edited.

The second assignment is to define some simple function in an external file and then evaluate it on the command line interface. The only “tricky” part of the assignment is to put the file with the function in the right place so that *Octave* can find the function definition. Alternatively you can tell *Octave* where to look for the function file.

Once you are able to evaluate your first function, try defining more complex functions. Ideally you should be able to work with functions with a variable-length argument and return lists.

Exercise 3:

Like functions, complete *Octave* programs or scripts are usually written in external files and later evaluated. The third assignment is to write a simple *Octave* program in an external file and then evaluate it on the command line interface.

Exercise 4:

Many of the programs we will be implementing read and write data from files. For this fourth assignment you have to write an *Octave* program that

1. creates two 100×50 matrices. The elements of the matrices should be random values between 0 and 1.
2. writes each matrix in a different file.
3. and finally, reads the two written files.

Exercise 5:

Representing data graphically is extremely useful for evaluating results. The final assignment is to plot the natural logarithm between 0 and 10 using *Octave*. Then, using *Octave* “print” the plot to a JPEG image.