MATLAB Workshop

TECHNISCHE HOCHSCHULE LÜBECK

Sheet 9 – while and for-loops

Please write all commands in the MATLAB editor into one single m-file and save it in a folder that you specifically dedicate to this workshop. If you don't know how a command is being used type "`help [commandname]`" into the command window. Comment each code line briefly to document what it is doing.

Exercise 1:

Find out the 1000th number in the Fibonacci-sequence.

Exercise 2:

Proof numerically that

$$\sum_{n=1}^{\infty} \left(\frac{1}{2}\right)^n$$

is a finite number. For that, set an arbitrary (modestly high) upper limit of that sum and calculate the sum up to that limit in a loop to get the most probable limit value. Then design a while-loop that calculates the sum indefinitely. It should only be exited if the probable limit value is exceeded. Display a counter variable on the screen to see up to which value the sum has already been calculated.

Exercise 3:

Proof numerically that

$$\int_1^{\infty} \frac{10\,dx}{x}$$

does not converge. For that, approximate the integral with a sum.