MATLAB Workshop

TECHNISCHE HOCHSCHULE LÜBECK

Sheet 5 – Plotting – subplots

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:

Plot the function y = $\sin(\frac{\pi}{2}x)$ in the range of x $\in$ [-10;10]

a) Using the `plot` command
b) Using the `ezplot` command
c) Add title, labels and modify the limits of x and y-axis such that both figures look the same. Use commands in the m-file line to do this.

Exercise 2 (similar to Exercise 3 of sheet #4):

a) Create a figure window containing space for 6 subplots using 2 rows and 3 columns.
b) Show that $y = e^{-x}$ will show up as a straight line in a semilogarithmic plot by plotting it into the first subplot (with single data points). In that, mark the single data points with a symbol of your choice.
c) Find an example for a function that only shows up as a straight line in a double-logarithmic plot and prove it with MATLAB. For that, use the subplot elements 2, 3, 4, and 5 and plot your function with double-linear axis, semilogarithmic in x, and in y direction, and double-logarithmic.

Exercise 3:

a) From the figure created in Exercise 1, assign the figure handle, and the axes handles to newly created variables, such that you can access them.

b) Extract the “position” of the first, second, third and fourth subplot (as the subplot command would enumerate them) within the figure.
c) Move the position of subplot 1 into the free space that is left in the figure (where subplot 6 would go). Pay attention that everything is aligned.

Exercise 4 (optional):

Create a plot with two y-axes containing y1 = sin($\frac{\pi}{4}x$) and y2 = 4.22+0.03*cos($\frac{\pi}{4}x + \frac{\pi}{8}$) in the range of x $\in$ [-10;10]. What is the range (i.e., the min and max values) of data for y1 and y2?