

Sheet 1 – Datatypes: Vectors and characters

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:

You have done your groceries and would like to do some calculations with the prices of the items you have bought. Fig. 1 shows your receipt.



Fig. 1: Receipt from the supermarket

- Make one row-vector called `prices` that contains all the prices between the two red lines.
- Make a column-vector called `prices_col` that contains the prices of the last 4 items.

- c) Let MATLAB determine the size of the vectors `prices` and `prices_col`.
- d) Let MATLAB calculate the sum of the vector `prices`. Suppress the output in the command window.
- e) Write the message "The sum is:" into the vector `char_msg` and display this vector (`disp`) before outputting the sum from part d) in the command window.
- f) Sort the elements from vector `prices` in ascending order and save the result in a new vector `prices_sorted`. Use the command `sort` for this.
- g) Output the 5th element of the vector `prices`.
- h) Output the odd elements of the vector `prices_sorted`.
- i) Output the three highest prices.

Optional:

- j) Calculate the net price (i.e., the price before 19% value-added-tax) from the vector `prices` and save the result into a new vector `net_prices`.
- k) Let MATLAB output the median value, i.e., the center value from the sorted vector `prices_sorted`. For this, let MATLAB first calculate which one is the center value rather than just taking the 6th or so value in order to make this code more general.

Exercise 2:

- a) Define a row-vector `v` with step size 2 from 0 to 10.
- b) Define a column-vector `w` with step size 1 from 0 to -5.
- c) Add and subtract `v` and `w`. Each time, the result should be a row vector.

- d) Perform an element-wise multiplication of $(v+w)$ with $(v-w)$. The result should be a row-vector.
- e) Generate a vector `linvec`, which contains 5 linearly spaced elements from 0 to 10.
- f) Create a vector that is 2 times the element of `linvec`.
- g) Create a vector from `linvec`, whose elements are raised to the power of 1.7.
- h) Generate a log-spaced vector (Basis 10, i.e. each element is 10 times the preceding element) from 0.01 to 100 with 5 elements.