

Home assignment 2

March 19, 2015

Deadline 29.03.2015 23:59 PDF file of the report should be sent to sven.nomm@gmail.com
Scripts, codes, functions etc. should be presented during the practice on 2.04.2015.

If you missed the lecture on 19.03.2015 please contact me by e-mail sven.nomm@gmail.com to request your personal data.

Please DO NOT SEND your report to any other e-mail addresses!!!

Please present your **own** original work. Strictly no plagiarism!!!
Results should be supported by necessary computations, scripts, functions and codes.

Preferred implementation language is MATLAB. Observe restrictions on allowed usage of standard functions!!!

Please keep number of pages reasonable!

Report (preferably in L^AT_EX) should be structured as follows:

1. Student name and code;
2. Problem statement;
3. Short description of the used method(s);
4. Description of the implementation;
5. Description of the experiments and results;
6. Remarques.

1 Linear model building

Array X contains the values of independent variables and y - the values of dependent variable. Your goal is to find linear model

$$\hat{y} = a_1x_1 + \dots + a_px_p + b$$

where $1 \leq p \leq 15$.

Hint 1: Not all the variables are used.

Hint 2: Check if the variables are independent.

NOTE: It is not allowed to use any ready to use packages of functions which perform model building!!! You are expected to implement model building loop yourself! You are allowed to use function which generate model for the given variables. For example function "fitlim" is permitted but "step-wise" is not! If you unsure do not hesitate to ask!

2 Nonlinear additive model*

Array X contains the values of independent variables and yn - the values of dependent variable. Your goal is to find additive model. You may use whatever packages you will find. Nevertheless you are expected to be able to explain tools and interpret the results.

Hint : There are 5 additive terms, each of them is a periodic function.

$$y = \alpha_1\phi(x_{p_1}) + \dots + \alpha_5\phi(x_{p_5})$$

3 Polynomial

Array X contains the values of independent variables and yp - the values of dependent variable. Your goal is to find polynomial which fits the data.

$$y = a_1x_{p_1}^5 + a_2x_{p_2}^4 + \dots + a_5x_{p_5} + b$$

You may use whatever packages you will find. Nevertheless you are expected to be able to explain tools and interpret the results.