# Project #1: Data Pre-processing

Using your project data file (Row data), your task is to perform.

1. **Data Pre-processing**
2. **Feature Selection**
3. **Moving average Smoothing**

Please use y**our comments** for each step that you did.

**Do not use my comment**s shown in the lecture code example.

**Please hand in a clean code!**

**Please make your final comments in the last part of your code about the results you obtained based on a) b) and c) comparing the uncleaned and cleaned dataset.**

**Project #2: Linear and Multivariable Regression**

Using your cleaned project file, splitting the dataset into training/testing

Your task is to perform:

1. **Linear regression modeling.**

Vp as a function of DEN, NEU and Vs

**b) Multivariable regression modeling:**

Vp as a function of the combination of Vs, DEN, and NEU

**c) Select the best model and compute uniaxial compressive strength (Co) with the true Vp and model estimated Vp**

Please write the reason for the selection of the best model.

Write the equation of the best model in your code.

Please comment on what you did on the code.

**Please hand in a clean code.**

**Please make your final comments in the last part of your code about the results you obtained.**

**Project #3 Non-Linear Regression**

Without splitting the dataset, use your cleaned project file:

Your task

**a) Perform Non-Linear Regression modeling.**

**b) Select the best model and compute Uniaxial compressive strength (Co) with the true Vp and model estimated Vp**

Please write the reason for the selection of the best model.

Write the equation of the best model in your code.

Please comment on what you did on the code.

**Please hand in a clean code.**

**Please make your final comments in the last part of your code about the results you obtained.**

**Project #4 Artificial Neuron Network Regression**

Using your cleaned project file:

Your task

**a) Perform ANN Regression modeling.**

**b) Using the best model and compute uniaxial compressive strength (Co) with the true Vp and model estimated Vp**

- Apply training dataset to predict Vp

- Apply testing dataset to predict Vp

Please comment on what you did on the code.

**Please hand in a clean code.**

**Please make your final comments in the last part of your code about the results you obtained.**