CS454-554 Homework 1: Polynomial Regression
Spring 2022/2023

In this homework, you will implement regression using polynomials of various degrees.

You are provided with two dataset files. As their names imply, **train.csv** file will be used for training and **test.csv** file will be used for testing. Each row of these files corresponds to one instance where the first value is the input $\boldsymbol{x}$ and the second value is the desired output value r. You have 20 instances for training and 80 instances for testing.

You should use the training set to fit polynomials of different degrees, and the test set, unused during training, to estimate the accuracy of the fit.

1) Fit polynomials of degrees from 0 up to (and including) 6, and for each, plot the fitted polynomial together with the training data. Plot separate plots for each degree.

2) Calculate the Sum of Squared Errors (SSE) for all the seven models on both the training and test sets, and plot these errors as a function of the degree.

This homework is due **March 15th (Wednesday), 23:00**.

Your submission should include a short report of your findings, your plots, and your source code. Upload your submission as **one pdf file** to LMS.

You can use Python or Matlab, and you are allowed to use external libraries such as Numpy to fit a polynomial.

Reminders (from the syllabus):

- There will be no makeup for missing homeworks and late homeworks will not be accepted.
- All homeworks should be submitted for a passing grade.