

# AER850 Introduction to Machine Learning

## Assignment 2

Marks. 10

Due on: February 16<sup>nd</sup> 2023, 2 pm

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- This is an individual assignment.
  - You are free to use libraries with general utilities, such as numpy and scipy for python.
  - Be precise with your explanations in the report.
  - Submit the assignment report along with your code on D2L by the due date.
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### Gradient Descent for Regression

You are given Dataset-2 that consists of train, validation, and test files. The input is a real valued scalar and the output is also a real valued scalar.

- a) Fit a linear regression model to this dataset by using gradient descent or stochastic gradient descent. Use the step size of  $1e-6$ . Compute the MSE on validation set for every epoch. Plot the training and validation MSE for every epoch.
- b) Try different step sizes and choose the best step size and report the test MSE of the chosen model.
- c) Visualize the fit for every epoch and report 5 visualizations which show how the regression fit evolves during the training process.