ME 793 - Assignment 7

Department of Mechanical Engineering, IIT Bombay
Spring 2024
Due Date: 9:30 AM, April 01, 2024, Marks 20

Assignment Date: 11:59 PM, April 5, 2024

Objective and Instructions

1. The objective of this assignment is to compare GD algorithm that we developed in the class against the one available in a Python library.

2. This needs to be performed using Jupyter Notebook or Google Colab Notebook or only.

3. Submit Jupyter Notebook, Jupyter Notebook pdf, and your data file to Moodle.

Q 1. [**7 points**] Start with Python Notebook "Tutorial Gradient Descent" posted on Moodle. For the problem defined in tutorial for 200 data points, 0.1 learning rate, 1000 iterations, use the mini–batch optimizer function with a mini–batch of 20 points. Use a train:validation:test split of 70:20:10. You should first split the data into train:validation:test and then divide the train part into mini–batches of 20. Plot train loss vs iterations for this mini–batch gradient descent function for every mini–batch.

Q 2. [**7 points**] Find a similar function in any Python library of your choice e.g. Tensorflow, Keras etc. Repeat the above exercise using this library function. Note that our function is explicitly defined for linear regression. The library function may be generic. Plot train loss vs iterations for this library for every mini–batch.

Q 3. [**6 points**] Show the final test R^2 and $RMSE$ for part 1 and part 2. If there is a difference, comment in one short sentence about why could there be a difference.

$-end-$