ME 793 - Assignment 5
Department of Mechanical Engineering, IIT Bombay
Spring 2024
Due Date: 10:30 AM, Mar 23, 2024, Marks 20

Assignment Date: 10:30 AM, Tue, Mar 19, 2024

Objective and Instructions

1. The objective of this assignment is to develop a neural network for a material analysis problem.

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. Use the Python notebook named "Tutorial_NN_from_Scratch_Distribution.ipynb" that instructor has posted. Modify this Python notebook to read the data file named "material_data.txt" that was given with the Assignment 3 (k-Means clustering). Modify the neural network architecture such that it reads three columns namely "electronegativity", "atomic radius" and "density" as features and the column "thermal conductivity" as target. Make the NN work for this problem of regression. Do not change number of iterations, learning rate etc in the file. Finally run the model and as a proof that you modified the file and model ran,

    (a) **[10 points]** show the final RMSE error after 1000 iterations of training marking it as final answer. Also show RMSE for test data set. The data should be split into 80:20 ratio.

    (b) **[10 points]** Also, show neat and clean, well labeled pair pot of predicted thermal conductivity vs. true thermal conductivity.

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