

Homework #2

Please, write clearly and justify your work to receive credit.

Please complete the following assignment using Jupyter Notebook or Google Colab.

For this assignment, you can use the Python MLP implementation available from [scikit-learn.org](https://scikit-learn.org), at the link: `MLPRegressor`. You can also use PyTorch if you prefer and know how to use it.

Please email your completed assignment to me as a single PDF file to [mmarini2@Central.uh.edu](mailto:mmarini2@Central.uh.edu) and [dlabate@uh.edu](mailto:dlabate@uh.edu) no later than the due date at 1pm.

**Problem: Non-linear Regression**

You will use the dataset linked here: `noisy_sin_samples`.

1. **Plot the dataset** `noisy_sin_sample.csv`
2. Design three MLPs with 1 hidden layer and ReLU activation function for **non-linear regression** using 50, 90 and 130 neurons in the hidden layer. For each architecture, train a **nonlinear regression model** for varying numbers of epochs, and analyze the result calculating the accuracy (MSE error).
3. Repeat the analysis, keeping the best epoch number found above using this time the Tanh activation function.

**Plot the regression results** (superimposed to the original dataset as in the regression example shown in class) for the two activation functions and provide observations on the performance of each activation function, i.e., compare accuracy.