Response

Download  [Assignment10\_template](https://olat.vcrp.de/m/1c58f5c12eafe34eed9c0571f815077d/Assignment10.ipynb?href=Assignment10.ipynb) and use it as template for your solution. The template starts with the generation of a list of random numbers between -0.5 and 1.55 as input data. The input data is transformed into two kinds of target data by the application of formula\_1 and formula\_2. Input and corresponding target data are called dataset, thus we have two datasets. We want to train a neural network once to imitate formula\_1 and another time to imitate formula\_2. The goal is to observe how the parameters within the neural network are transformed through the training process.

Below the dataset creation in the template, you may find an incomplete class implementation of a minimal neural network, called NeuralNetwork, consisting of 2 layers and with Sigmoid as activation function of the hidden layer, otherwise assume identity as activation function. Below the implementation of the neural network class there is defined a function execute\_nn which instantiates the neural network class and shall train it over 100 epochs. Thus, a dataset is used 100 times to train the neural network. After the training, the parameters (weights and bias) of the neural network instance should be printed and the error curve over the epochs should be plotted in logarithmic scale. Furthermore, the target data and the data as outputted by the final neural network is shown in a scatter plot. Since the input data is generated randomly, you may expect different plots for every execution of the notebook. The whole function is called twice, one time for each dataset.

Task instructions are given as comments in the template. Read them carefully and perform the specified tasks.

Upload the .ipynb after completion. Marks will not be given without File upload.

Do not import any new libraries that are not already imported in the template.