Assignment 2: Neural Network Activation Functions

Objective

The objective of this assignment is to understand the impact of different activation functions on the performance of a neural network. You will construct a neural network with 2 hidden layers and test it with various activation functions to determine the best fit.

Instructions

We have written a code for you here:
Click here to access.

The code does the following:

1. Construct a sinusoidal dataset of 30-40 points.
2. Implement a neural network with 2 hidden layers, each containing 8 units.
3. Test the neural network with the following activation functions: Linear, ReLU, Tanh, and Sigmoid.
4. Evaluate and plot the performance for each activation function.

Your tasks

- Run the code and report your results.
- Try your best to make all activation functions fit the data. You can change the number of neural network layers. You can change the number of neural network units. You can also change the number of epochs.
- What do you observe? Using which optimizers where you able to fit the underlying data?
- **Give detailed reasons regarding why some optimizers work better than others.**

Report

In your report, include the following: 1. Plots for each activation function.
2. A discussion of which activation function provided the best fit and why.
3. Any additional observations or insights gained during the experiment.