

Assignment 2(discussion with ChatGPT)

Method:

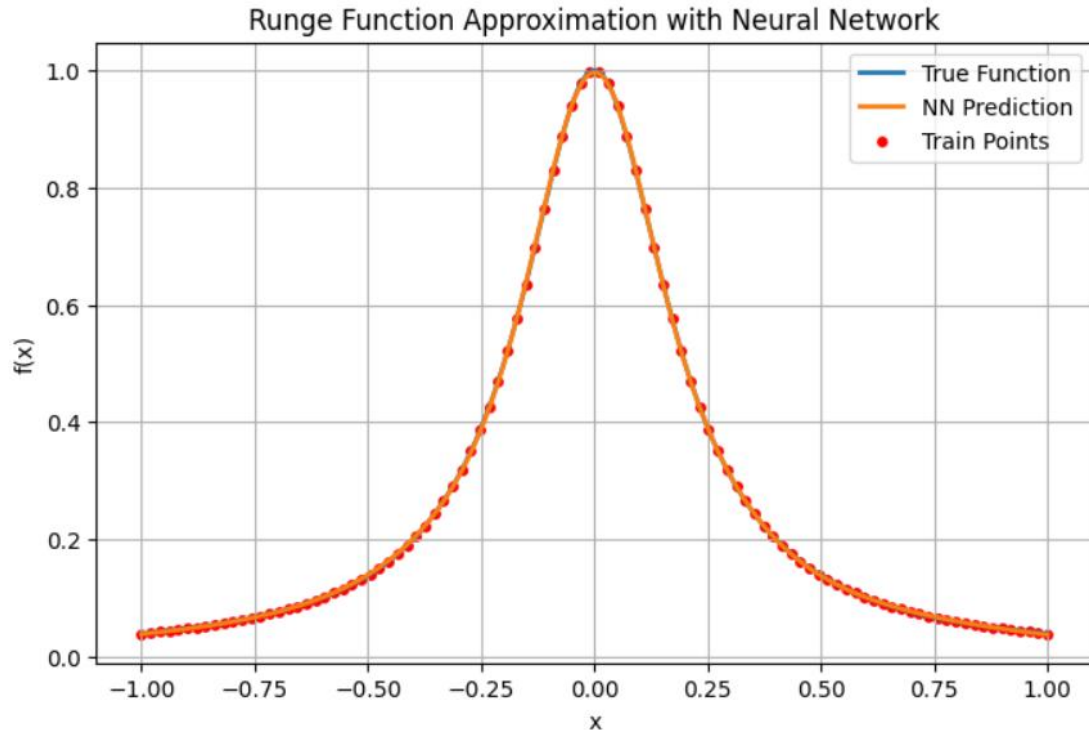
Data Generation: We generated 100 training points x_i evenly spaced in the Interval $[-1,1]$.

Neural Network Architecture: We used a fully connected multilayer perceptron (MLP) with two hidden layers, each containing 50 neurons and using the tanh activation function. The output layer has a linear activation.

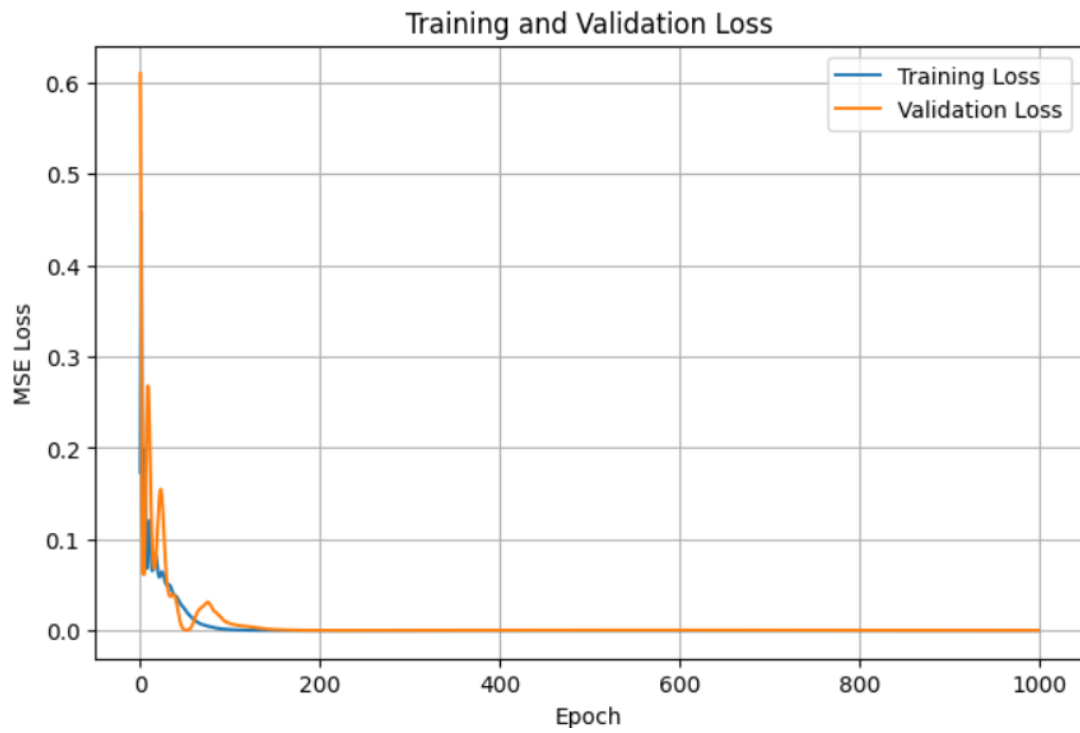
Results

The figure below shows the **true Runge function** (blue), **neural network prediction** (orange), **training points** (red), and **validation points** (green). The network closely approximates the function across the entire interval.

The **training and validation loss curves** indicate that the network converged smoothly without overfitting.



(using the code provided by ChatGPT and run in google colab)



Final MSE on all points: 0.000070

Final Max Error on all points: 0.029971

(using the code provided by ChatGPT and run in google colab)