

1. Method

using a fully connected feedforward neural network.

Network architecture :

Layer	Neurons	Activation
Input	1	–
Hidden 1	20	Tanh
Hidden 2	20	Tanh
Output	1	Linear

Training setup:

Loss function: Mean Squared Error (MSE)

Optimizer: Adam, learning rate = 0.01

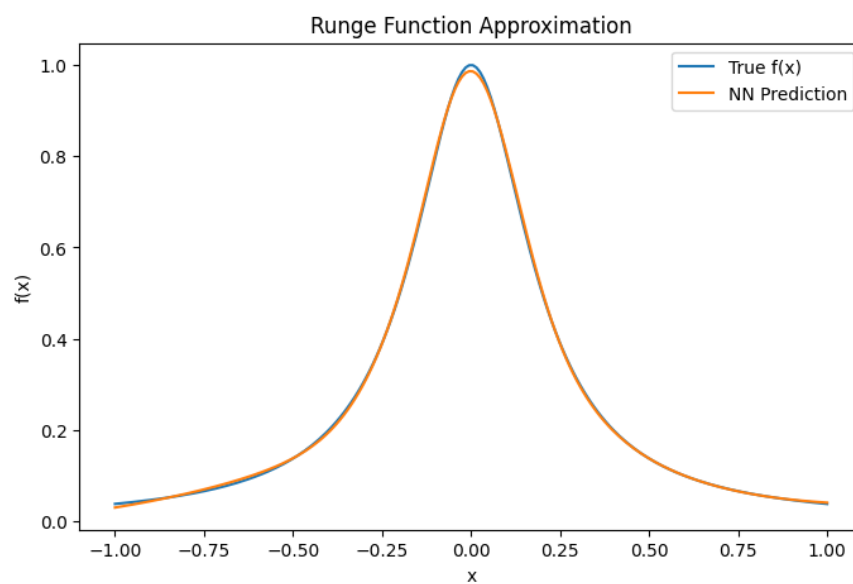
Epochs: 300

Loss recorded every 5 epochs

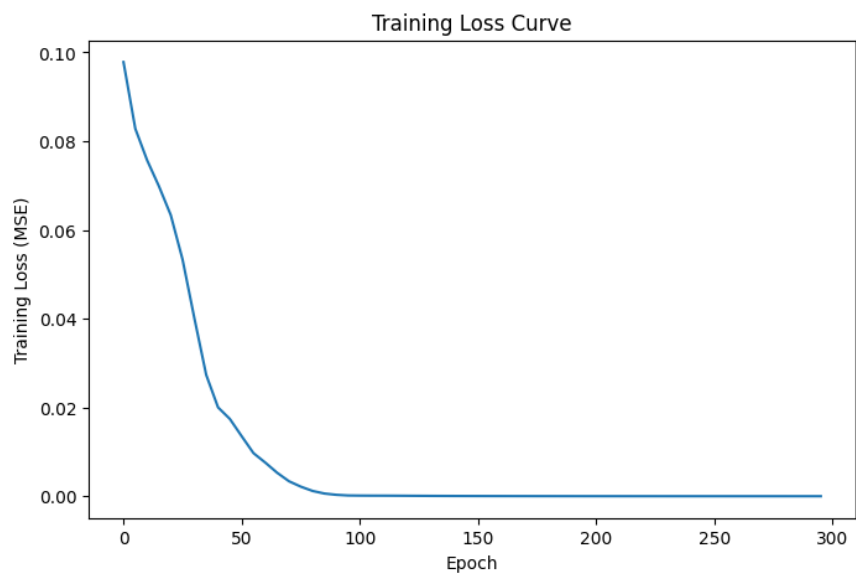
Training data: 100 evenly spaced points in $[-1,1][1,1][1,1]$

2. Results

Function Approximation



Training Loss



Error Analysis

Metric	Value
MSE	1.2359547795479762e-05
Max Error	0.009093808670244896

3. Discussion

With 300 epochs, the model has already achieved good convergence. The original version using 5000 epochs, as generated by ChatGPT, showed almost no visible difference.