Neural Network Inputs

Input x1

0.53

Input x2

0.80

Weight w_x1h1

1.00

Weight w_x2h1

0.69

Weight w_x1h2

1.00

Weight w_x2h2

1.00

Weight w_h1y

0.92

Weight w_h2y

0.90

Target Output

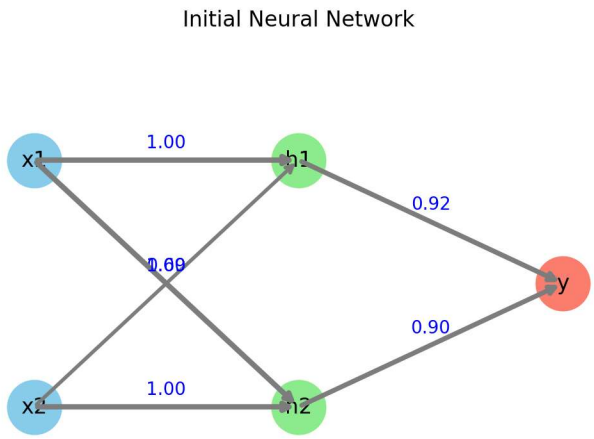
1.00

Learning Rate

0.10

Neural Network: One Training Iteration Demo

Initial Neural Network



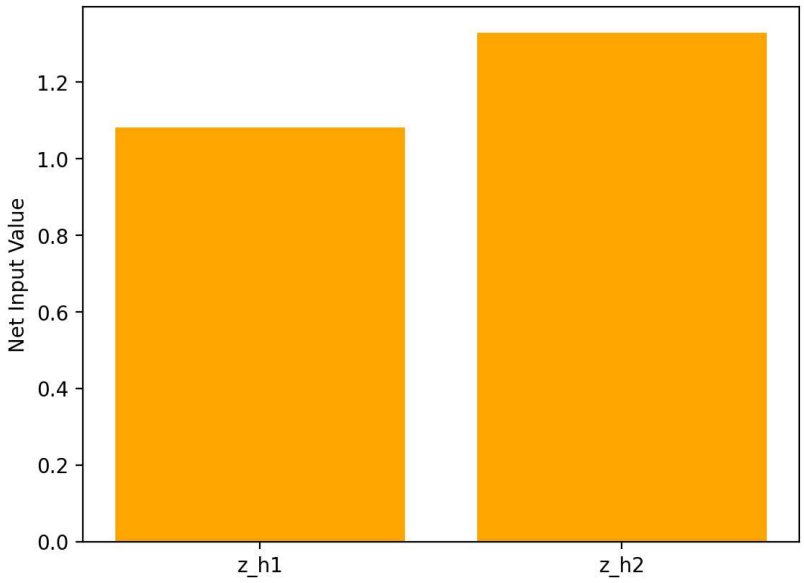
Forward Propagation Results

Hidden Net Inputs: z_h1 = 1.0820, z_h2 = 1.3300

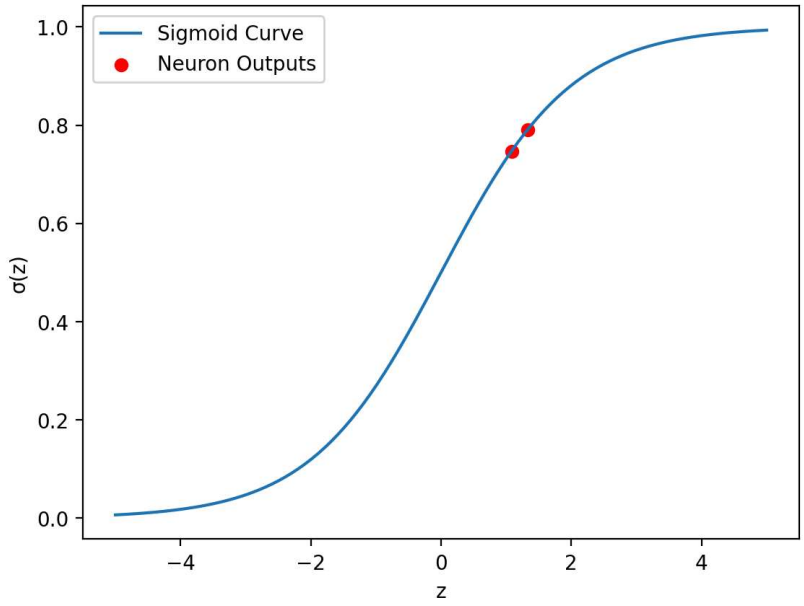
Hidden Outputs: h1 = 0.7469, h2 = 0.7908

Predicted Output: y = 1.3989, Target = 1.0, Error = 0.3989, MSE Loss = 0.079552

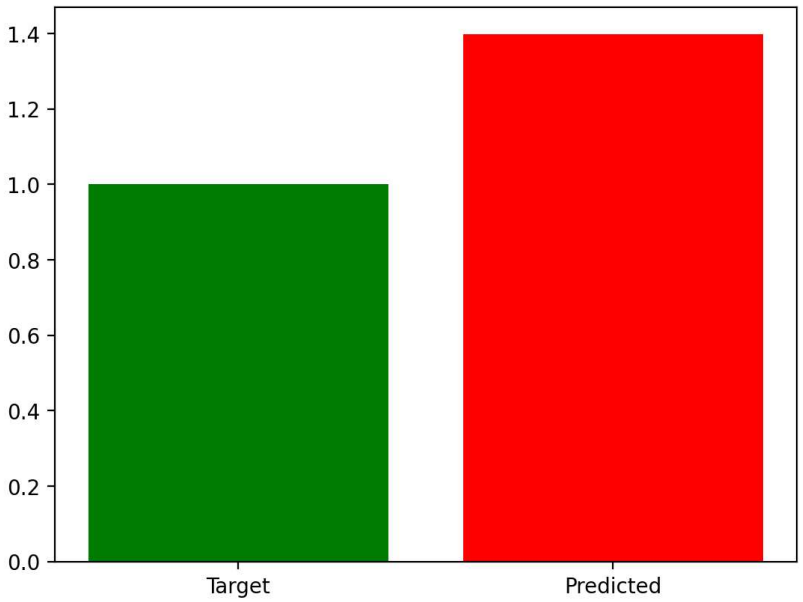
Step 1: Hidden Layer Net Inputs



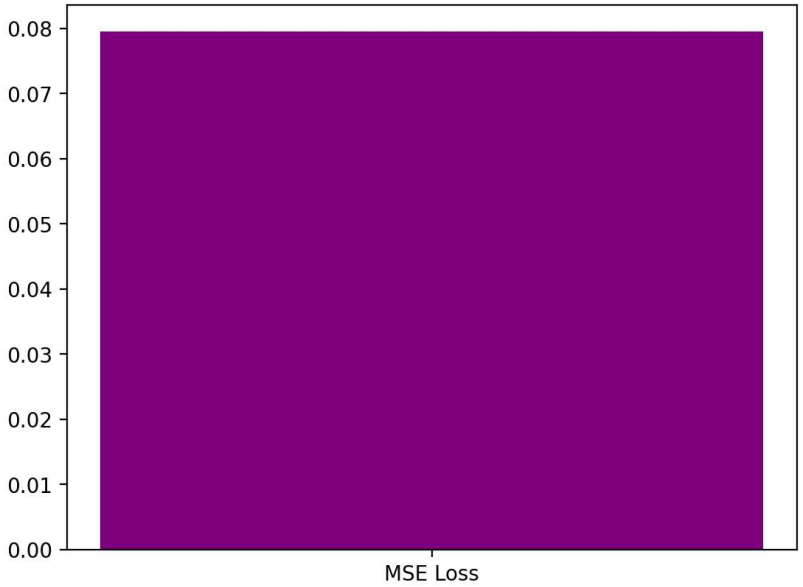
Step 2: Sigmoid Activation



Step 3: Target vs Predicted Output



Step 4: MSE Loss

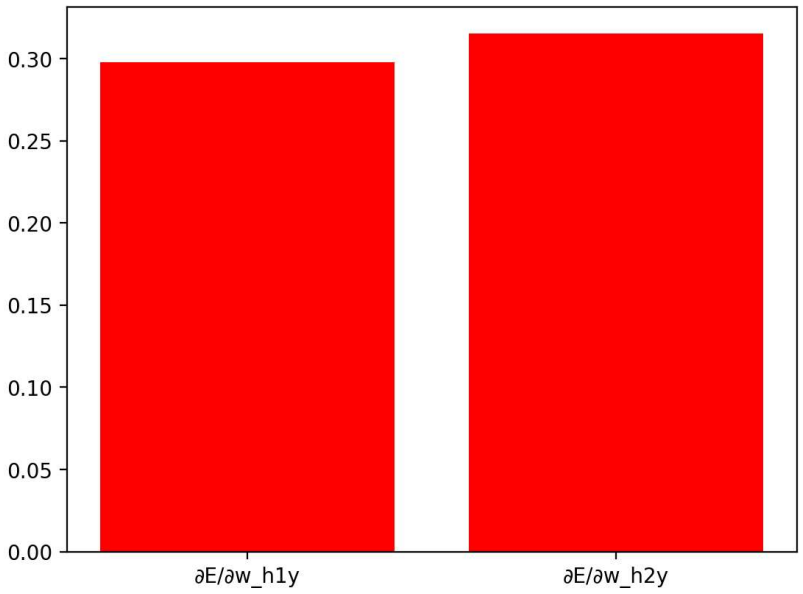


Backpropagation

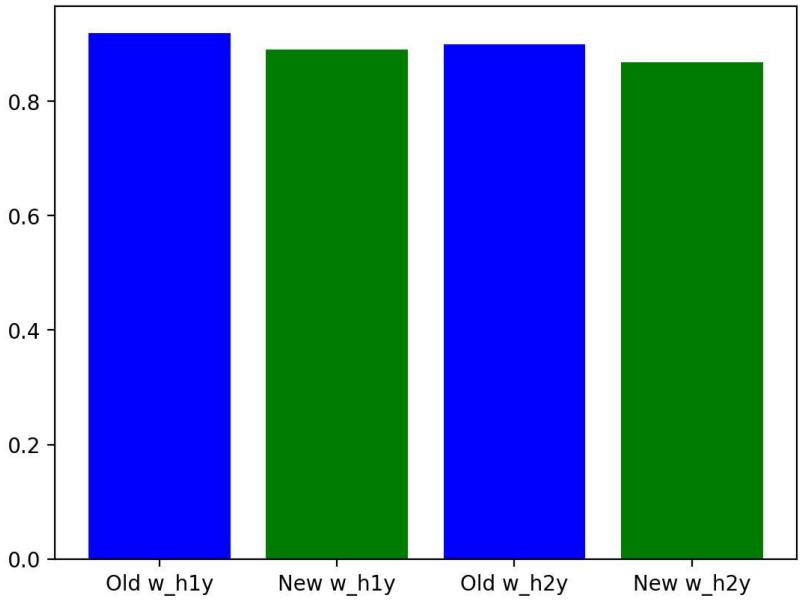
Gradients: ∂E/∂w_h1y = 0.297912, ∂E/∂w_h2y = 0.315450

Hidden Layer Deltas: delta_h1 = 0.069377, delta_h2 = 0.059381

Step 5: Output Layer Gradients

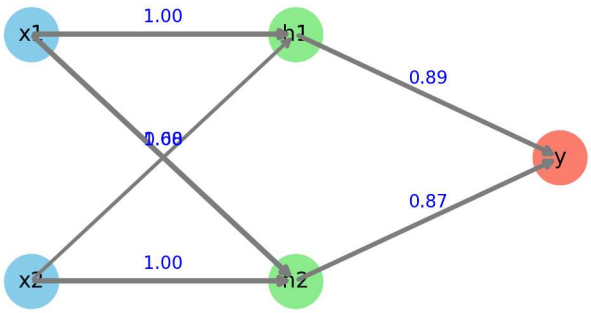


Step 6: Updated Hidden → Output Weights



Updated Neural Network

Updated Neural Network



Final Numerical Results

h1 = 0.7469, h2 = 0.7908

Final output y = 1.3989, MSE Loss = 0.079552

Updated Weights:

w_x1h1 = 0.9963, w_x2h1 = 0.6844

w_x1h2 = 0.9969, w_x2h2 = 0.9952

w_h1y = 0.8902, w_h2y = 0.8685

✅ One Training Iteration Completed Successfully!