Neural Network Inputs

Input x1
0.51

Input x2
0.70

Weight w_x1h1
0.30

Weight w_x2h1
0.43

Weight w_x1h2
0.68

Weight w_x2h2
0.40

Weight w_h1y
0.16

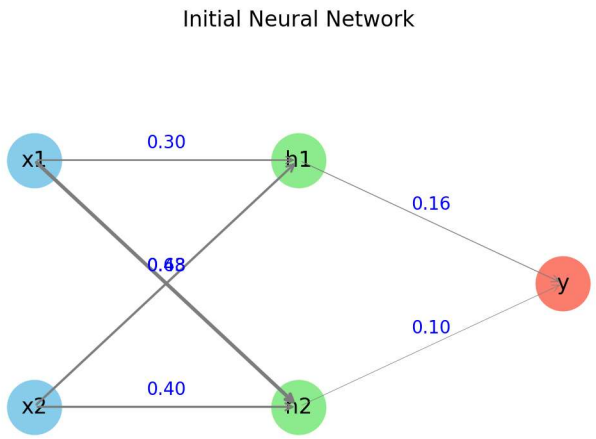
Weight w_h2y
0.10

Target Output
0.36

Learning Rate
0.05

🔷 Neural Network: One Training Iteration Demo

Initial Neural Network



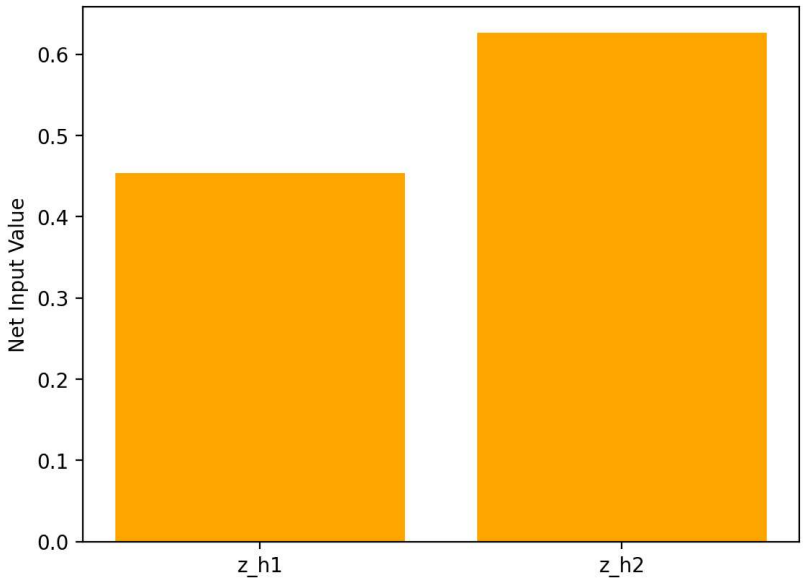
Forward Propagation Results

Hidden Net Inputs: z_h1 = 0.4540, z_h2 = 0.6268

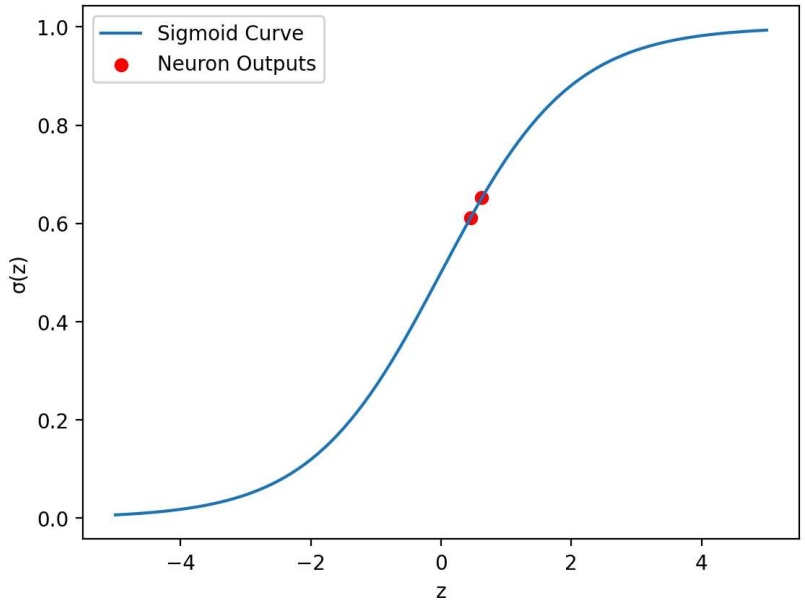
Hidden Outputs: h1 = 0.6116, h2 = 0.6518

Predicted Output: y = 0.1630, Target = 0.36, Error = -0.1970, MSE Loss = 0.019398

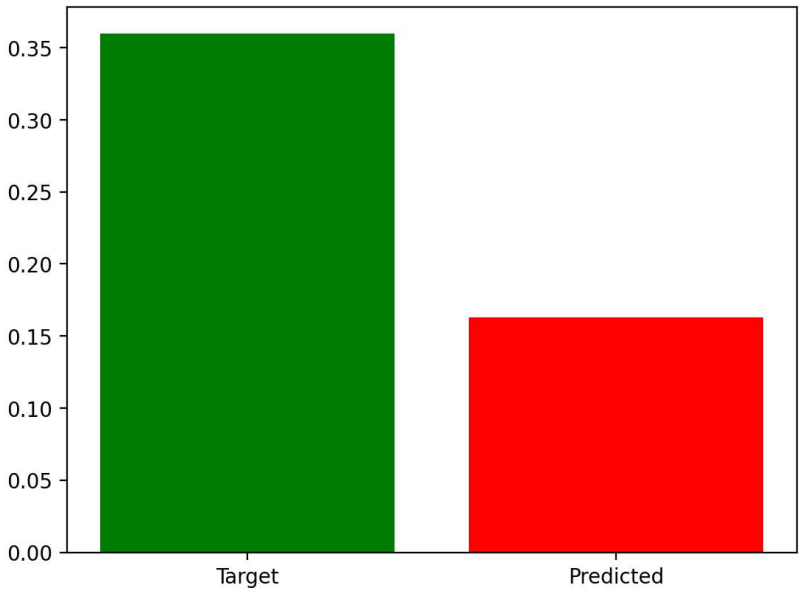
Step 1: Hidden Layer Net Inputs



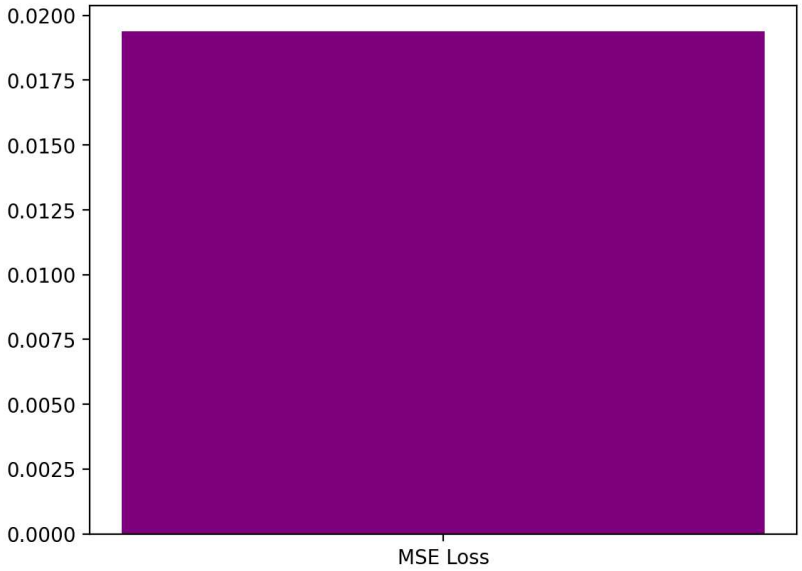
Step 2: Sigmoid Activation



Step 3: Target vs Predicted Output



Step 4: MSE Loss

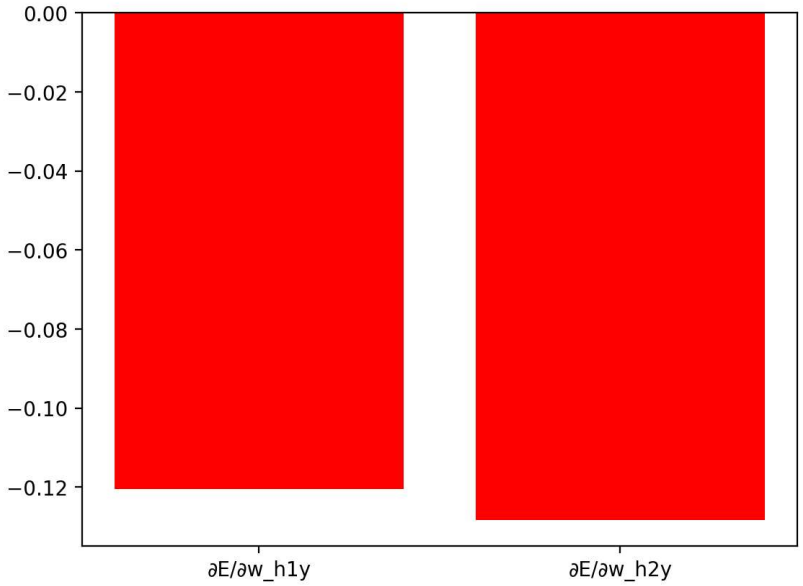


Backpropagation

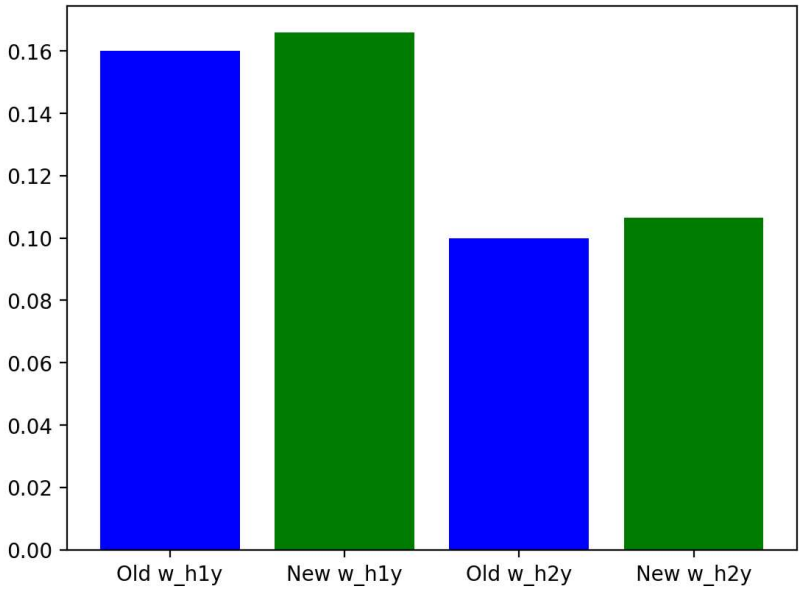
Gradients: ∂E/∂w_h1y = -0.120464, ∂E/∂w_h2y = -0.128377

Hidden Layer Deltas: delta_h1 = -0.007486, delta_h2 = -0.004471

Step 5: Output Layer Gradients

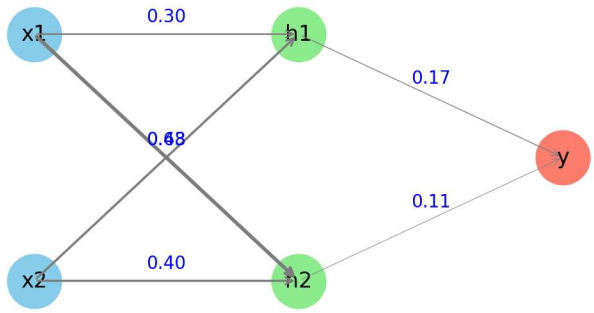


Step 6: Updated Hidden → Output Weights



Updated Neural Network

Updated Neural Network



Final Numerical Results

h1 = 0.6116, h2 = 0.6518

Final output y = 0.1630, MSE Loss = 0.019398

Updated Weights:

w_x1h1 = 0.3002, w_x2h1 = 0.4303

w_x1h2 = 0.6801, w_x2h2 = 0.4002

w_h1y = 0.1660, w_h2y = 0.1064

✅ One Training Iteration Completed Successfully!