

Math Foundation Assignment

Chapter 5: Multilayer Perceptron - MLP

Nguyen Dinh Thao - 2470887

Contents

5.1: Multilayer perceptrons:

- Hidden layers
- Activation functions

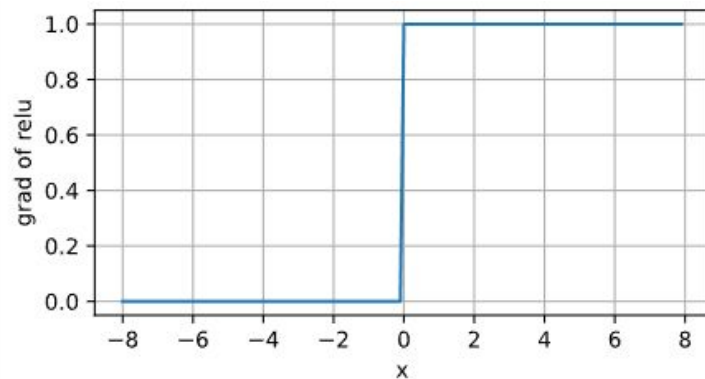
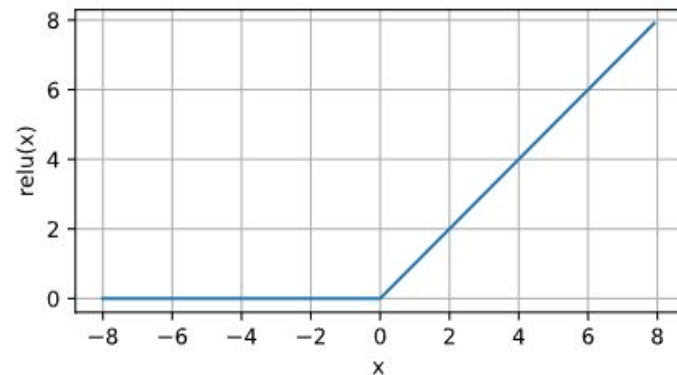
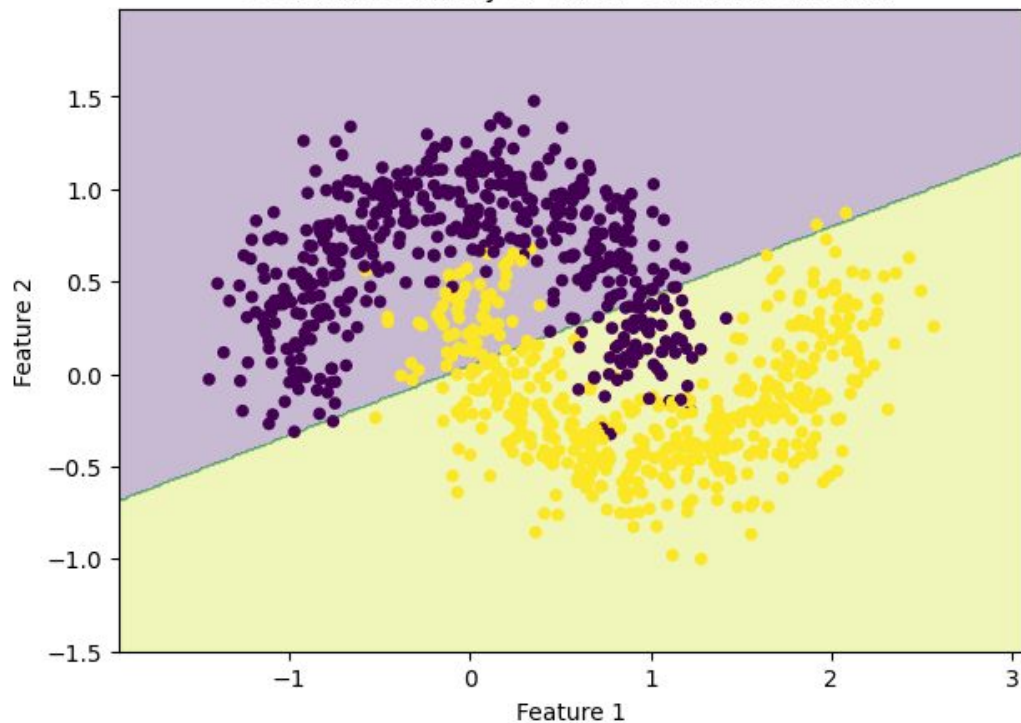
5.2: Implementation of MLP from scratch

- Implement MLP from scratch to classify MNIST dataset

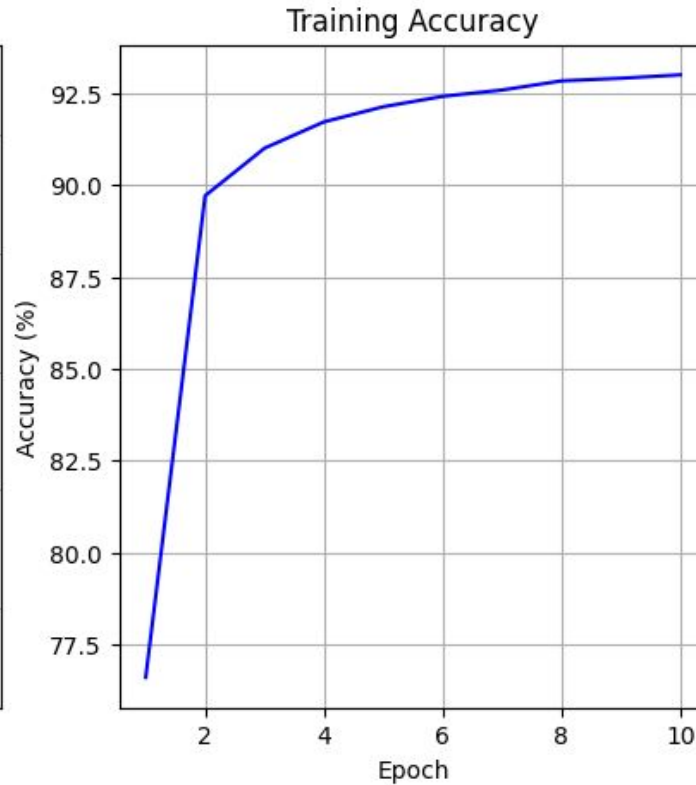
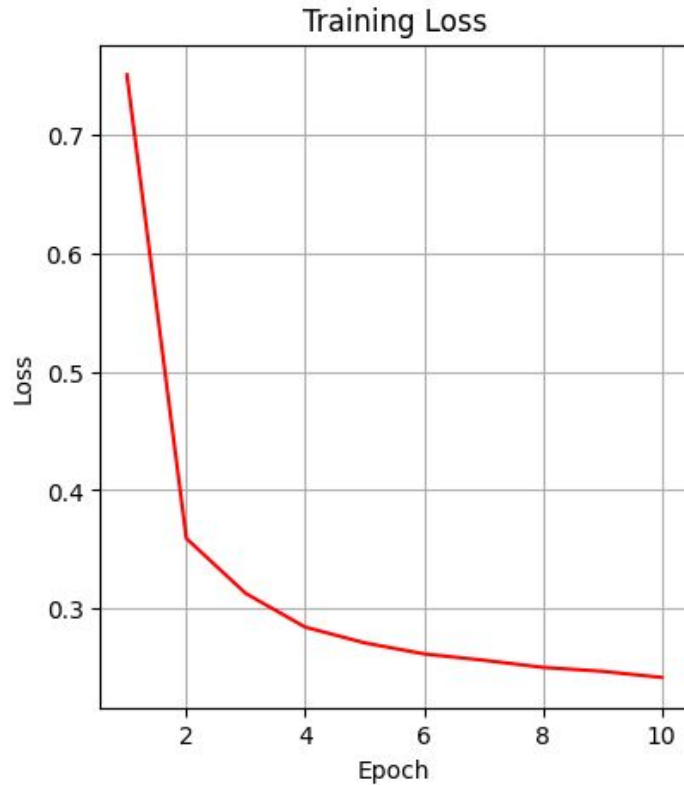
5.3: Forward Propagation, Backward Propagation and Computational Graphs

5.1: Multilayer Perceptions

Decision Boundary of Linear Soft-max Classifier

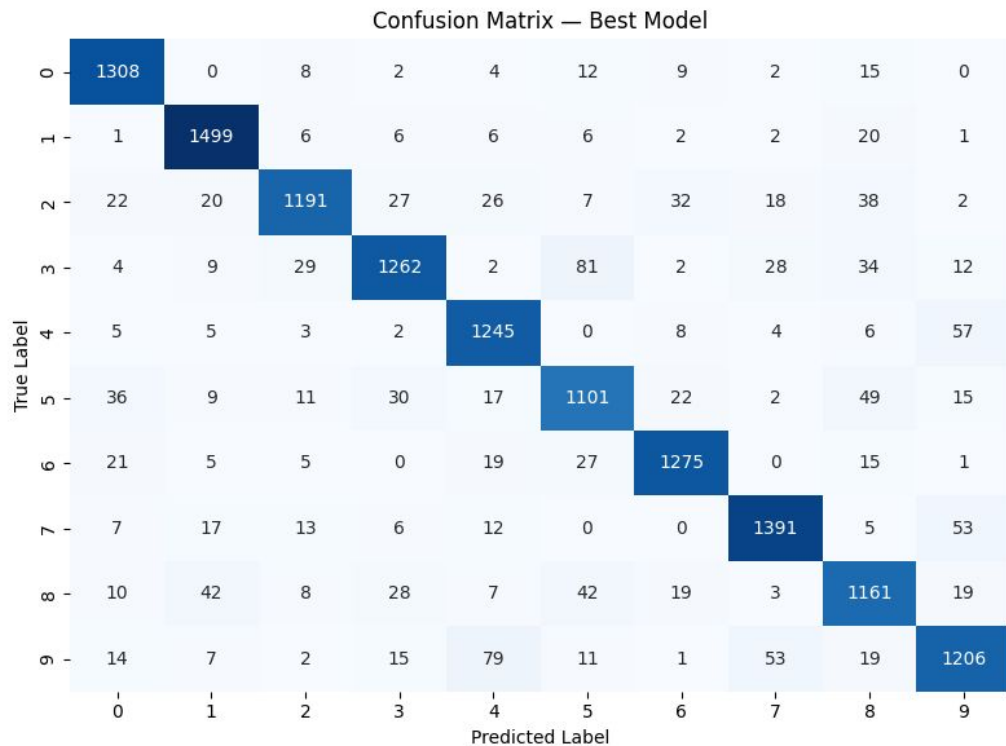


5.2: Implement MLP from scratch



5.2: Implement MLP from scratch

Final Test Accuracy (best model from epoch 2): 90.28%



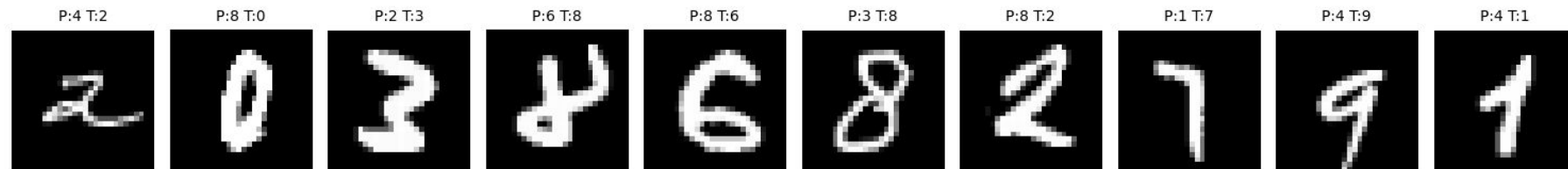
5.2: Implement MLP from scratch

Correctly classified: 12639
Incorrectly classified: 1361

Correctly Classified Samples



Incorrectly Classified Samples



5.3: Forward Propagation, Backward Propagation, and Computational Graphs

Forward: Input -> Hidden -> ... -> Output -> Loss

Backward: Loss -> Output -> ... -> Hidden -> Weight (apply chain rule)