CSE 641 | Deep Learning

Assignment 1

PTA

1. and gate:

Iteration number: 12
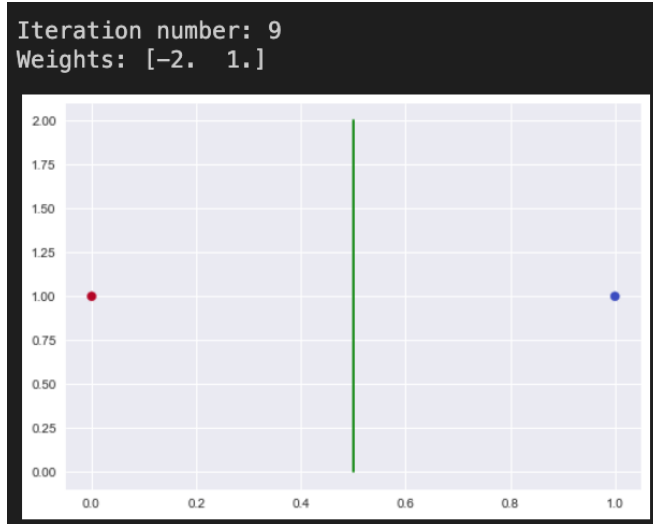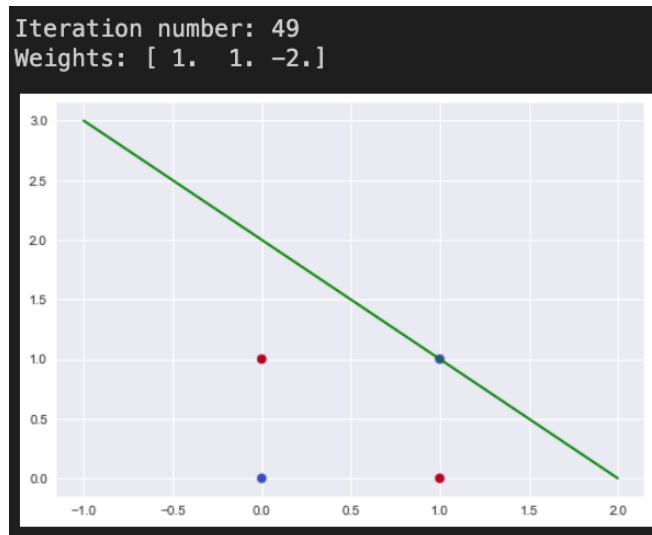Weights: [1.92518583 1.16455844 −2.50760198]

2. or gate:

Iteration number: 3
Weights: [1.05467284 0.44503133 −0.27100611]

3. not gate:


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Iteration number: 9
Weights: [-2.  1.]
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4. xor gate


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Iteration number: 49
Weights: [ 1.  1. -2.]
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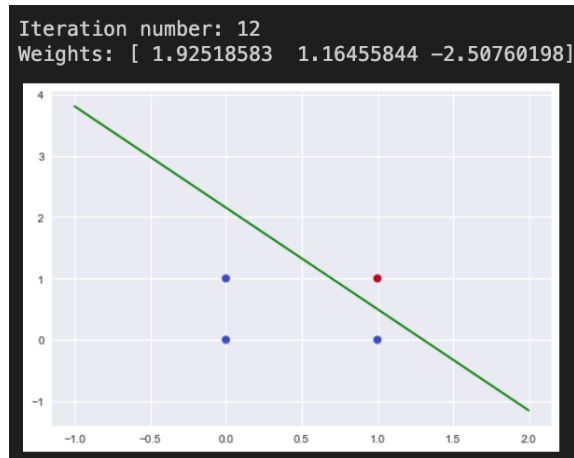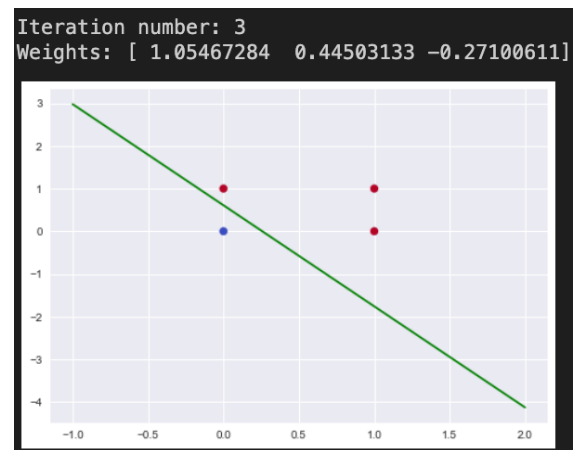
Madaline

Input: [[0, 0], [0, 1], [0, 2], [0, 3], [0, 4], [0, 5], [0, 6], [0, 7], [0, 8], [0, 9], [0, 10], [1, 0], [1, 1], [1, 2], [1, 3], [1, 4], [1, 5], [1, 6], [1, 7], [1, 8], [1, 9], [1, 10], [2, 0], [2, 1], [2, 2], [2, 3], [2, 4], [2, 5], [2, 6], [2, 7], [2, 8], [2, 9], [2, 10], [3, 0], [3, 1], [3, 2], [3, 3], [3, 4], [3, 5], [3, 6], [3, 7], [3, 8], [3, 9], [3, 10], [4, 0], [4, 1], [4, 2], [4, 3], [4, 4], [4, 5], [4, 6], [4, 7], [4, 8], [4, 9], [4, 10], [5, 0], [5, 1], [5, 2], [5, 3], [5, 4], [5, 5], [5, 6], [5, 7], [5, 8], [5, 9], [5, 10], [6, 0], [6, 1], [6, 2], [6, 3], [6, 4], [6, 5], [6, 6], [6, 7], [6, 8], [6, 9], [6, 10], [7, 0], [7, 1], [7, 2], [7, 3], [7, 4], [7, 5], [7, 6], [7, 7], [7, 8], [7, 9], [7, 10], [8, 0], [8, 1], [8, 2], [8, 3], [8, 4], [8, 5], [8, 6], [8, 7], [8, 8], [8, 9], [8, 10], [9, 0], [9, 1], [9, 2], [9, 3], [9, 4], [9, 5], [9, 6], [9, 7], [9, 8], [9, 9], [9, 10], [10, 0], [10, 1], [10, 2], [10, 3], [10, 4], [10, 5], [10, 6], [10, 7], [10, 8], [10, 9], [10, 10]]

Desired Output: [0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 1, 1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0]

Predicted: [0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 0.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.0, 0.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1.0, 1.0, 1.0, 1.0, 0.0, 0.0, 0.0, 0.0]
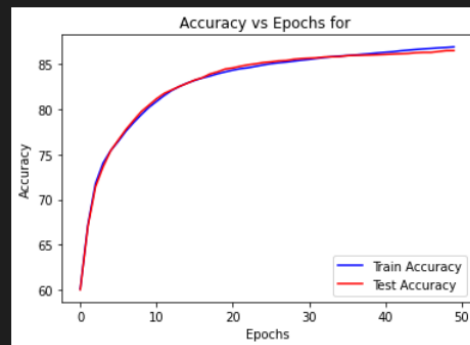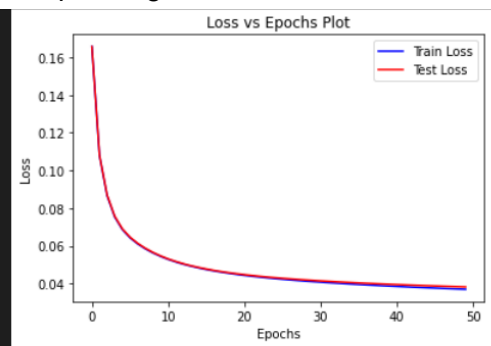Misclassified samples: 5
Accuracy: 95.86776859504133
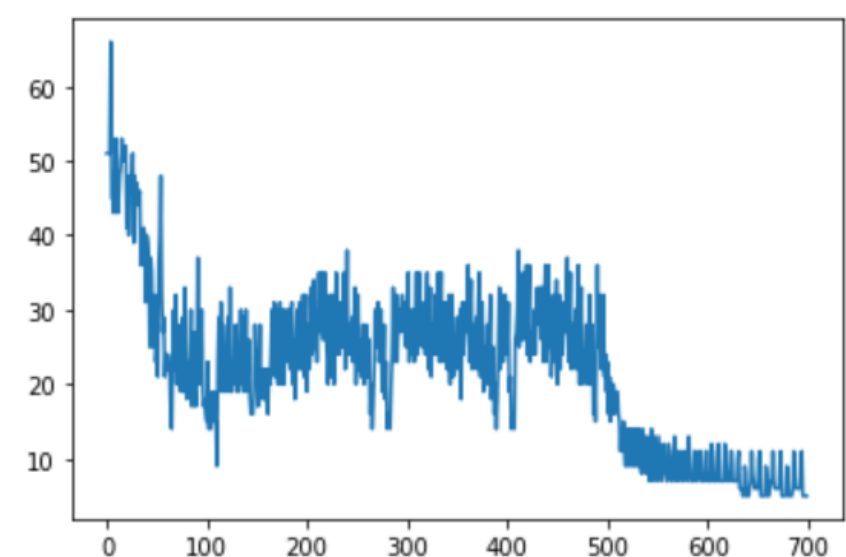
MLP

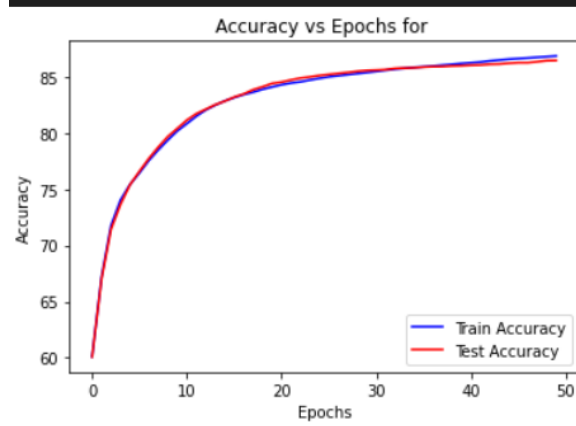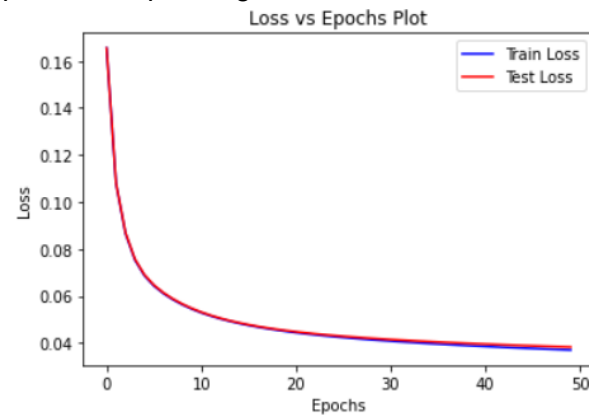Sample outputs corresponding to the best MLP architecture
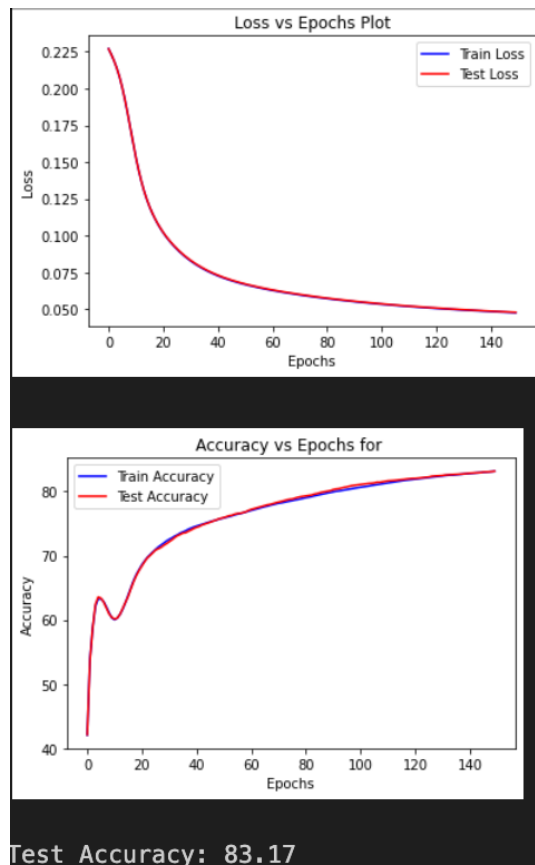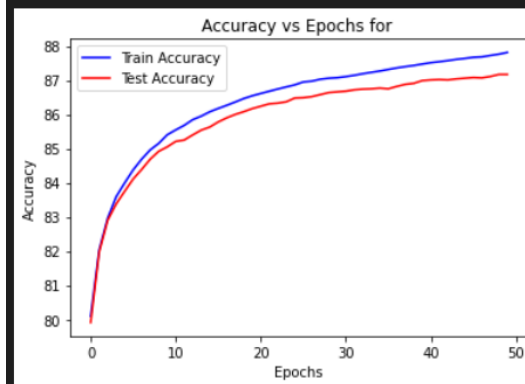
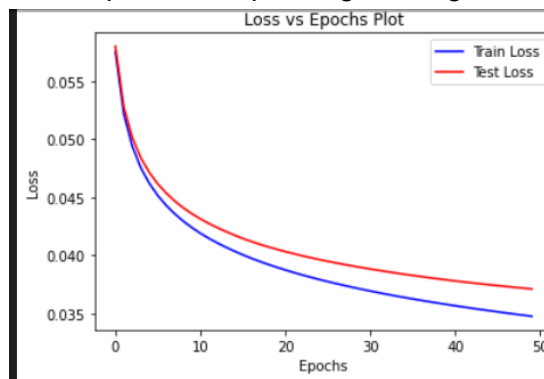Outputs corresponding to Gradient Descent with Momentum

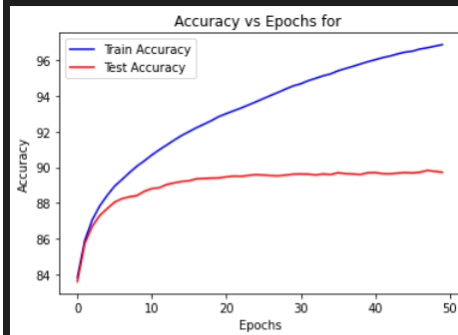Outputs corresponding to Nesterov's Gradient Descent
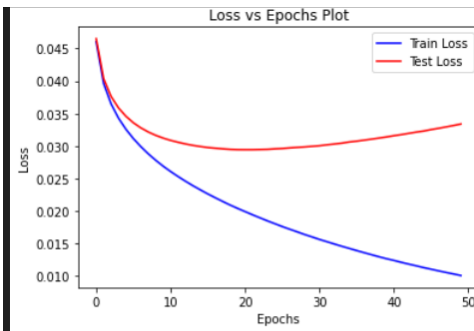
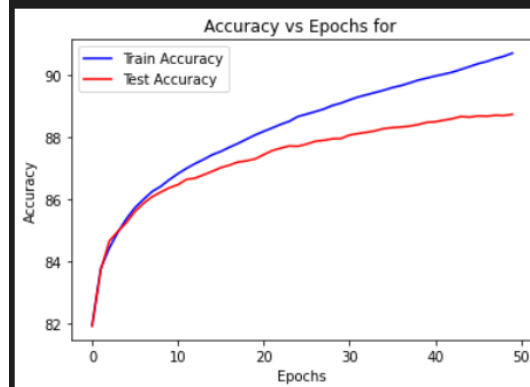

Test Accuracy: 86.48
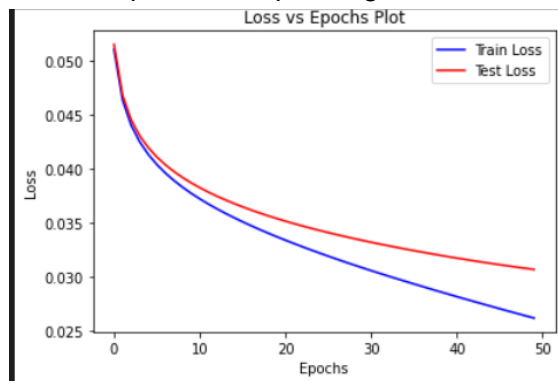
Outputs corresponding to Adagrad

Test Accuracy: 87.17

Outputs corresponding to RMSProp

Outputs corresponding to Adam

Test Accuracy: 88.73