Outputs | Assignment 1

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Perceptron

Weights are provided in the format `[w_0 w_1 w_b]`

AND

- Outputs present in `outputs/AND`
- Convergence in 11 iters
- Final weights: `[1.07630829 1.77991879 -2.56159077]`

OR

- Outputs present in `outputs/OR`
- Convergence in 3 iters
- Final weights: `[ 1.07630829 0.77991879 -0.56159077]`

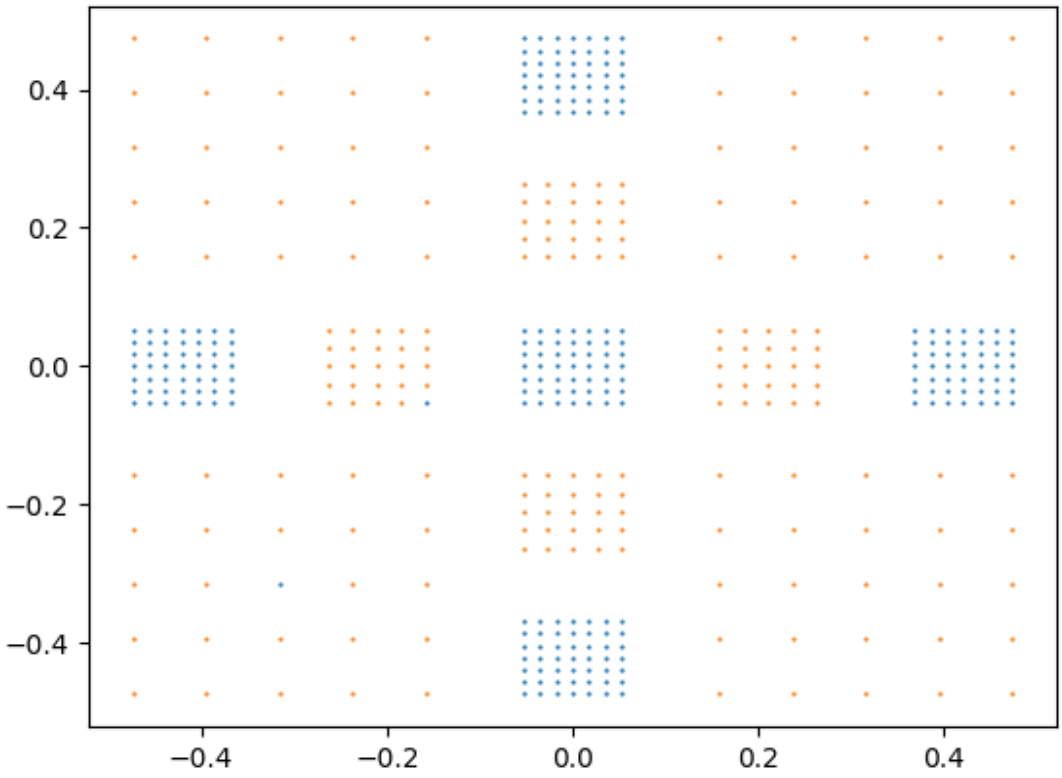
NOT

- Outputs present in `outputs/NOT`
- Convergence in 2 iters
- Final weights: `[-0.92369171 0.77991879 0.43840923]`

XOR

- Outputs present in `outputs/XOR`
- Weight update repeat in 5 iters

Madaline

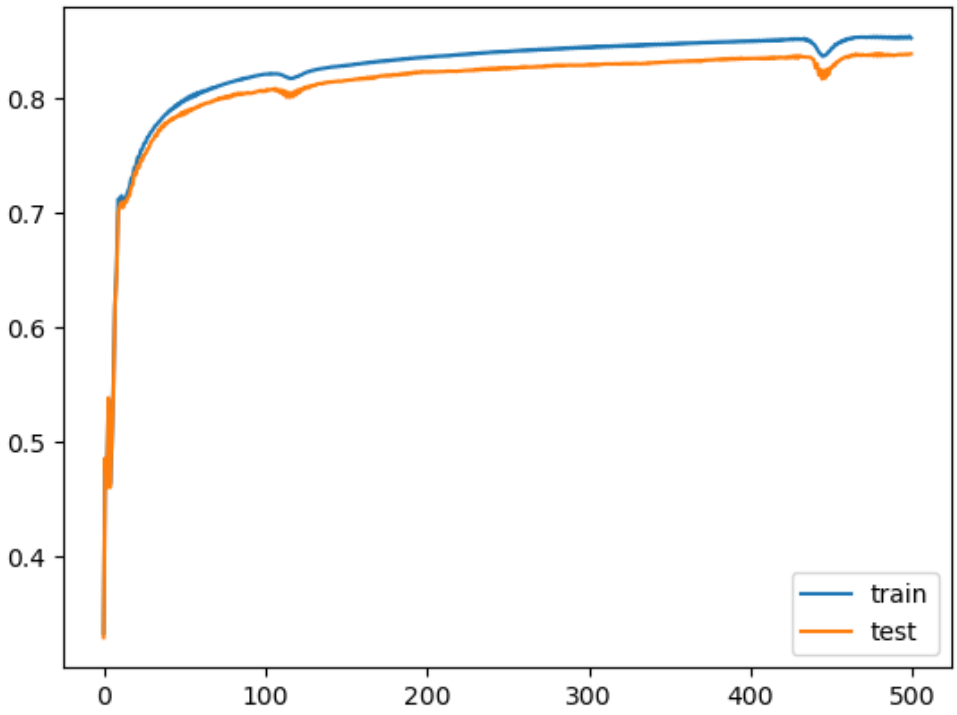


Madaline model performance with `99.55` accuracy.

MLP

Batch Gradients

- Among all the different configuration of different layers, learning rate, activation functions the best results were achieve with layers = [784, 64, 10], activation = ‘relu’ and learning rate = 0.1, with train accuracy = `0.85267` and test accuracy = `0.8389`



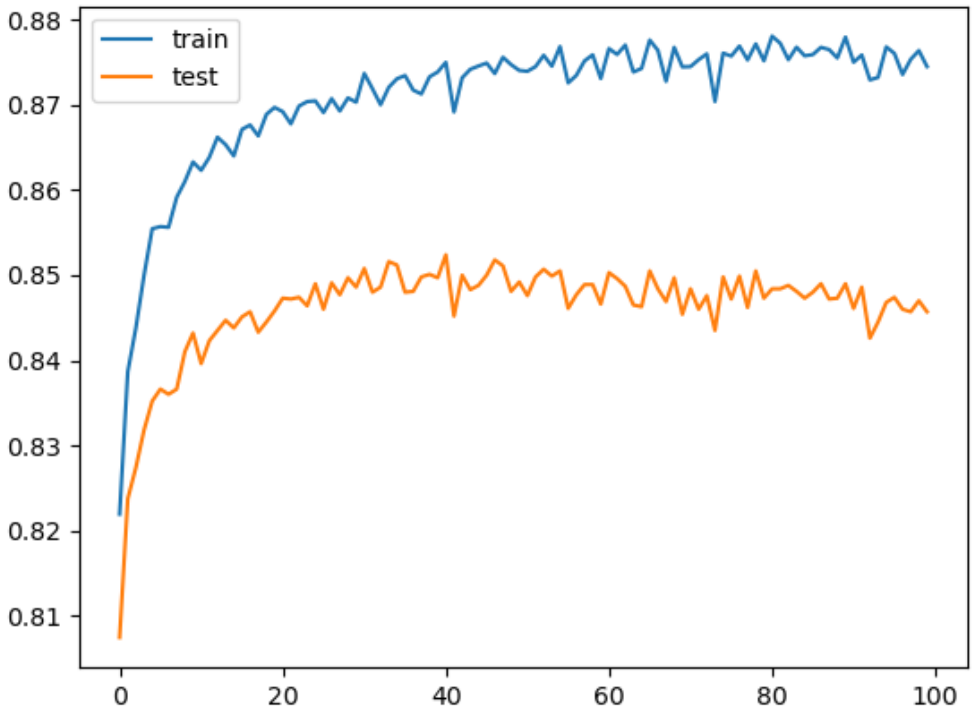
Epoch vs Accuracy Plots for the best configuration

GD optimizers

- The best configuration was tested with different optimizers with batch_size = 64

SGD with Momentum

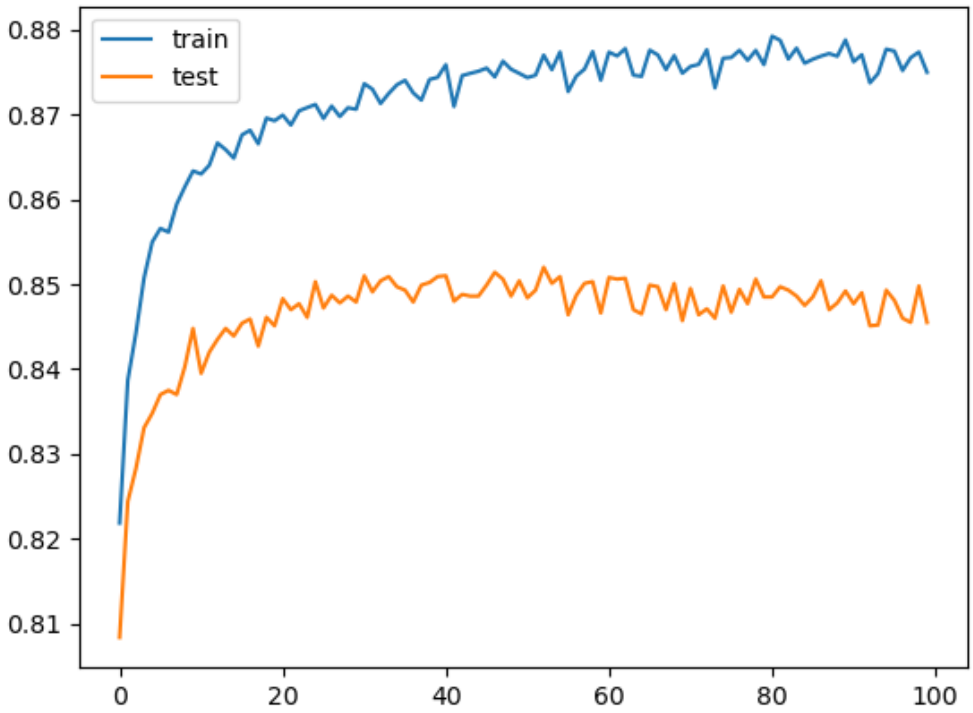
- Train accuracy = `0.8743` and Test accuracy = `0.8457`, lr = 0.001



Epoch vs Accuracy Plot

NAG SGD

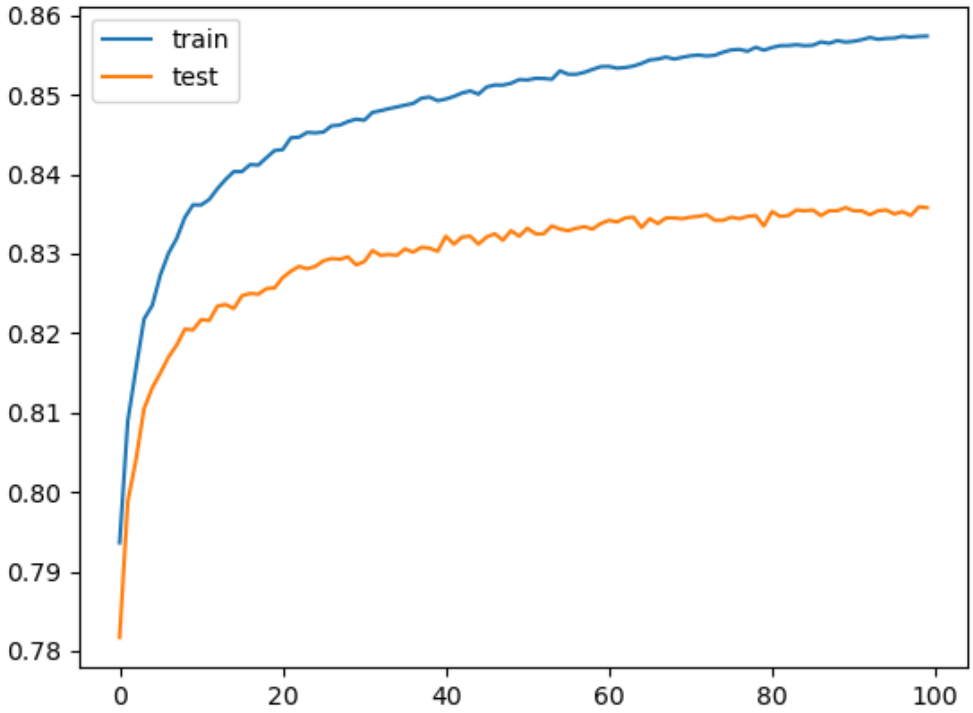
- Train accuracy = `0.87497` and Test accuracy = `0.8455` lr = 0.001



Epoch vs Accuracy plot

Adagrad

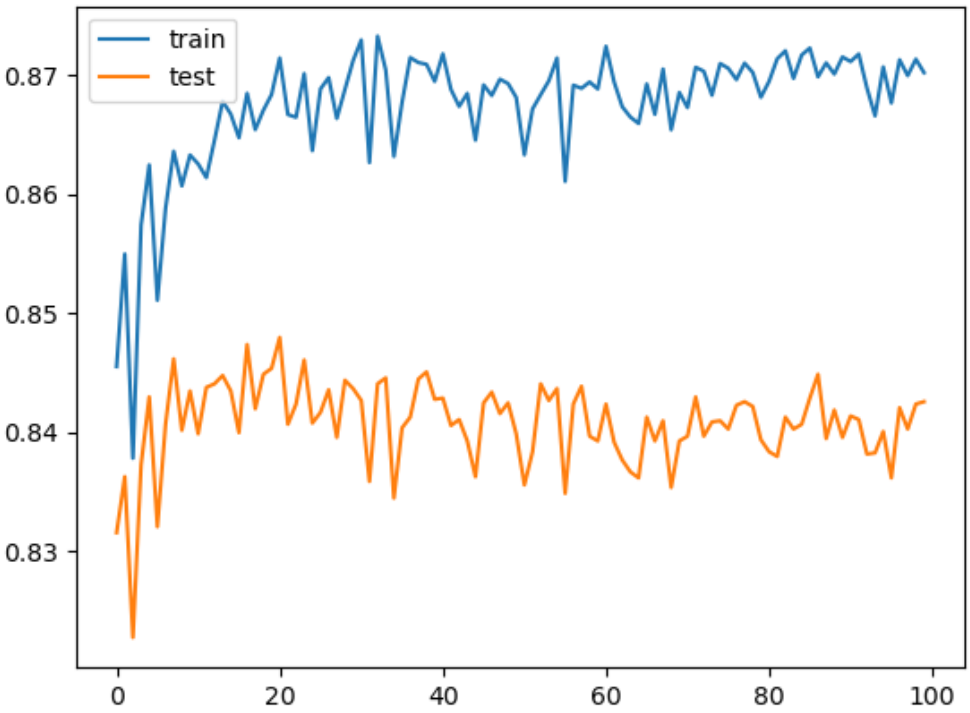
- Train accuracy = `0.85738` and Test accuracy = `0.83580` , lr = 0.001



Epoch vs Accuracy plot

RMSProp

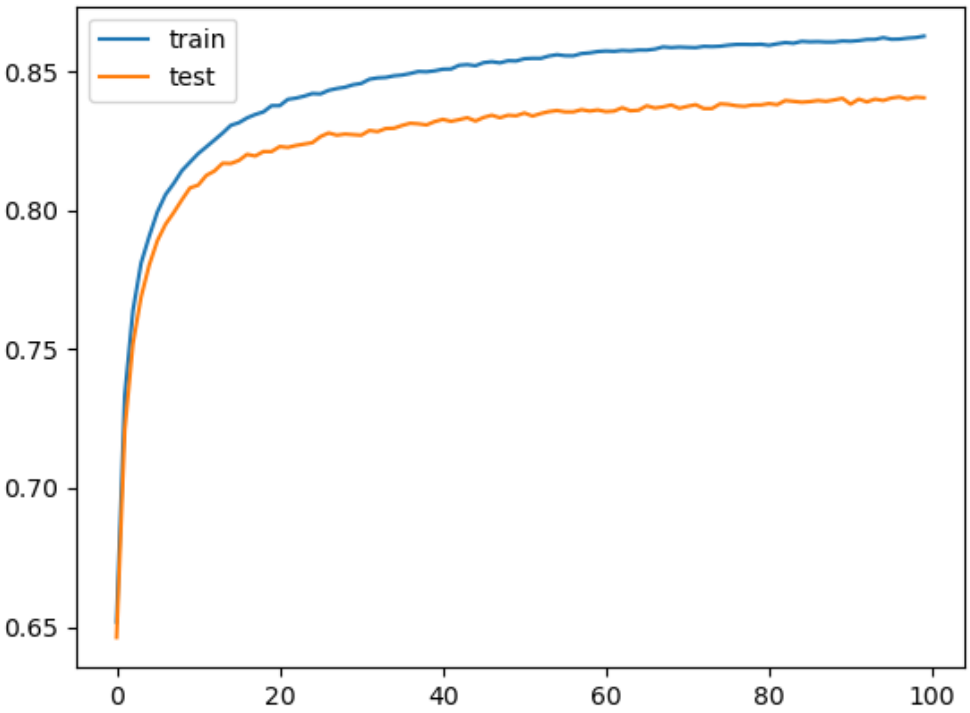
- Train accuracy = `0.87023` and `0.84260`, lr = 0.0005



Epoch vs Accuracy plot

Adam

- Train accuracy = `0.86290` and `0.85070`, lr = 0.001



Epoch vs Accuracy plot