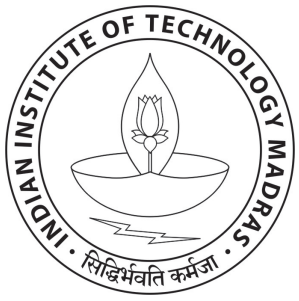

IIT MADRAS

CS7015-DEEP LEARNING

PROGRAMMING ASSIGNMENT 1
FEED FORWARD NEURAL NETWORK AND BACKPROPOGATION

February 17, 2018

Submitted by:

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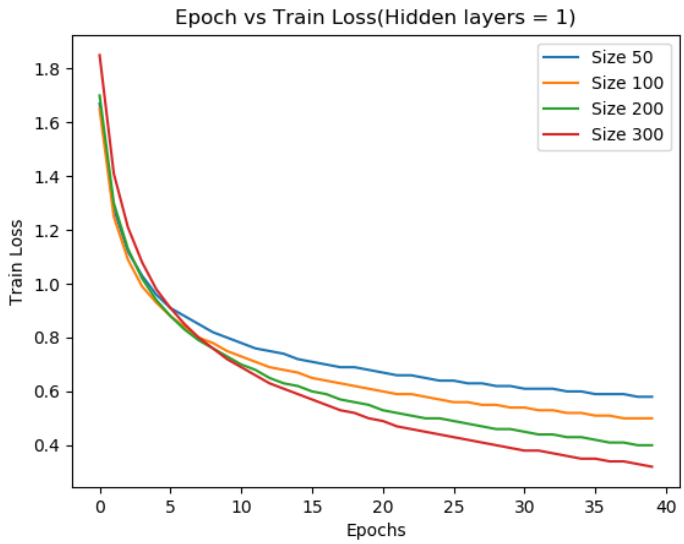
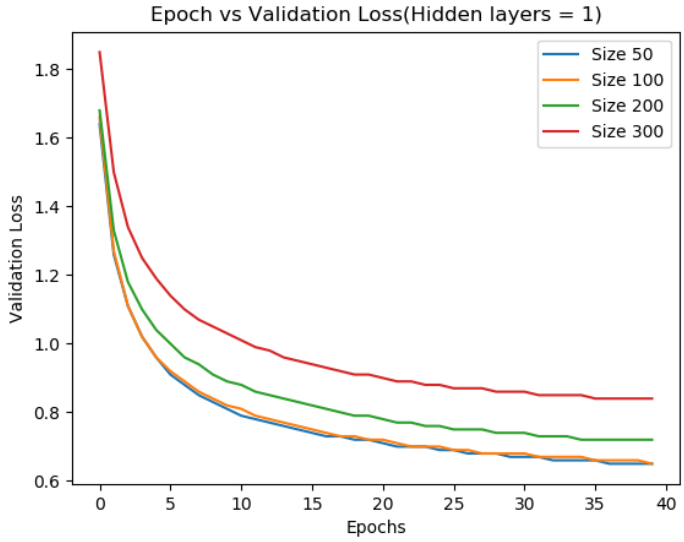
Contents

1 Epochs vs Loss plotted with varying hidden layers

1.1 Number of Hidden layers = 1



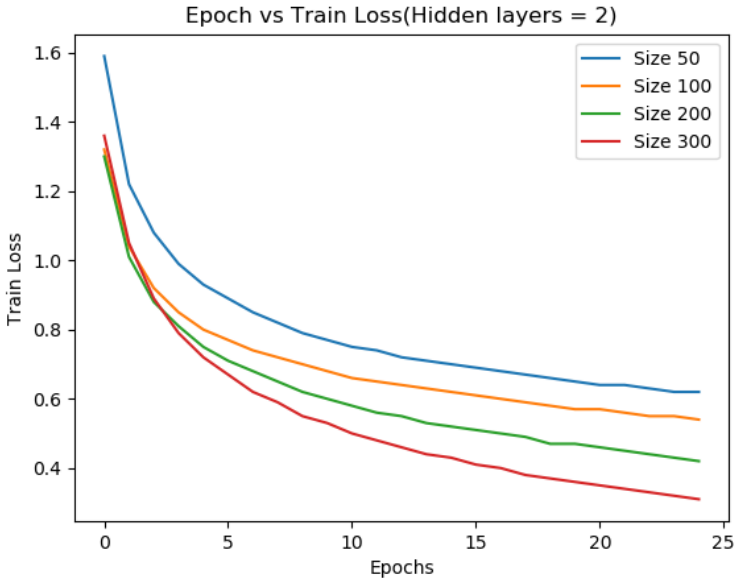
(a) Training loss at 40 epochs



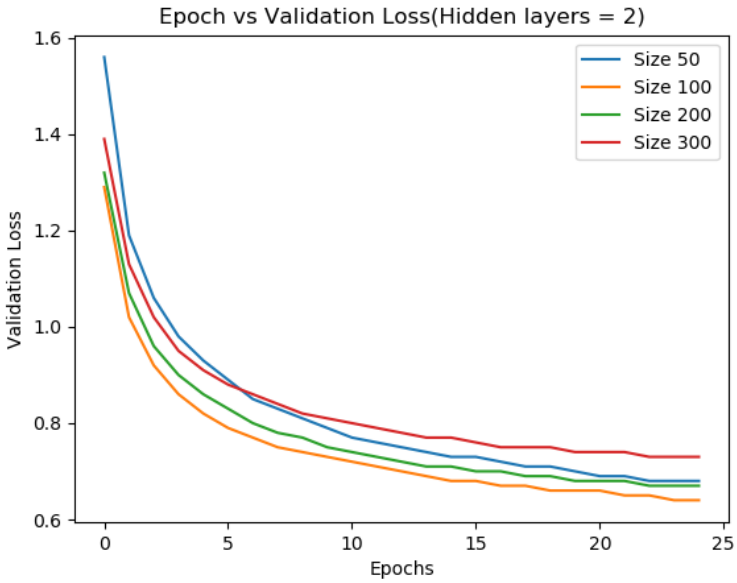
(b) Validation loss at 40 epochs

Figure 1: Loss with size of hidden layer(50,100,200,300)

1.2 Number of Hidden layers = 2



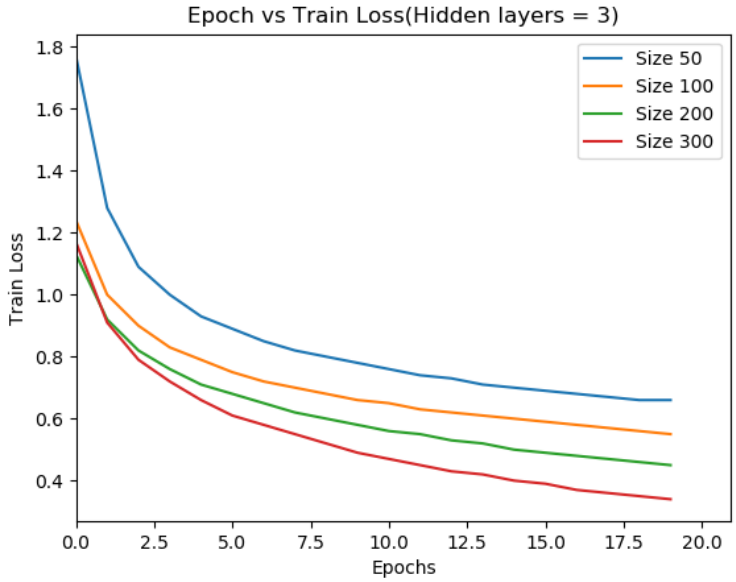
(a) Training loss at 25 epochs



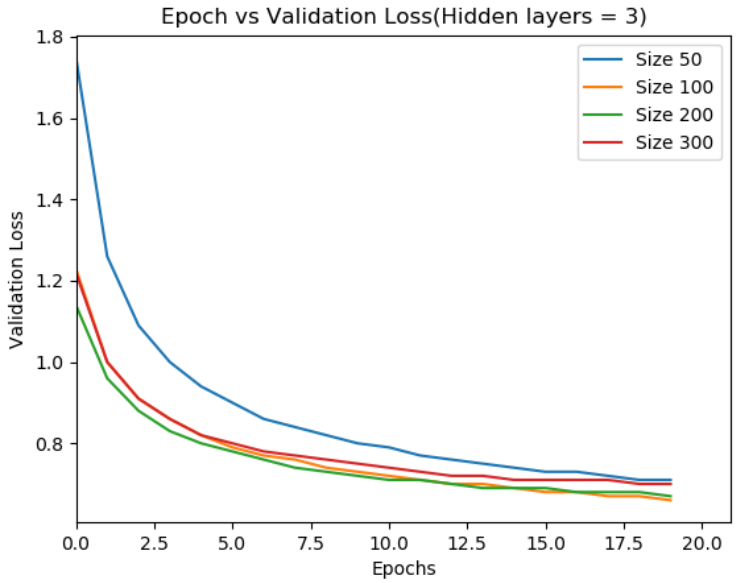
(b) Validation loss at 25 epochs

Figure 2: Loss with size of each hidden layer(50,100,200,300)

1.3 Number of Hidden layers = 3



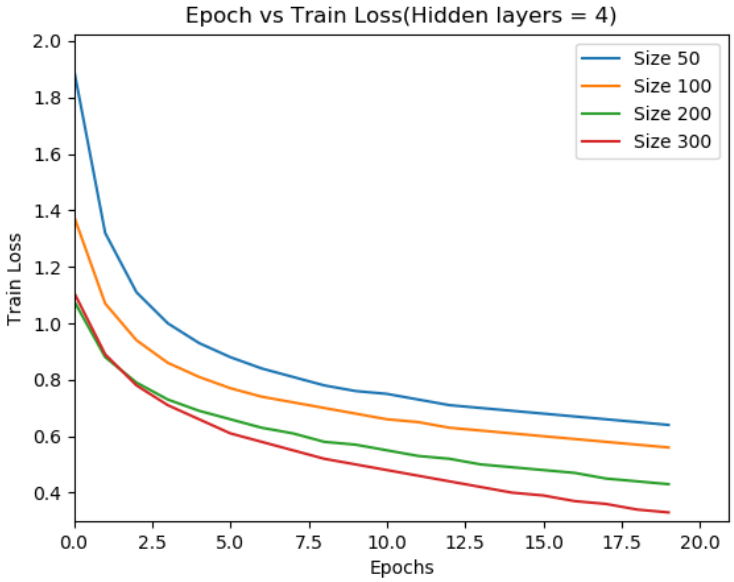
(a) Training loss at 20 epochs



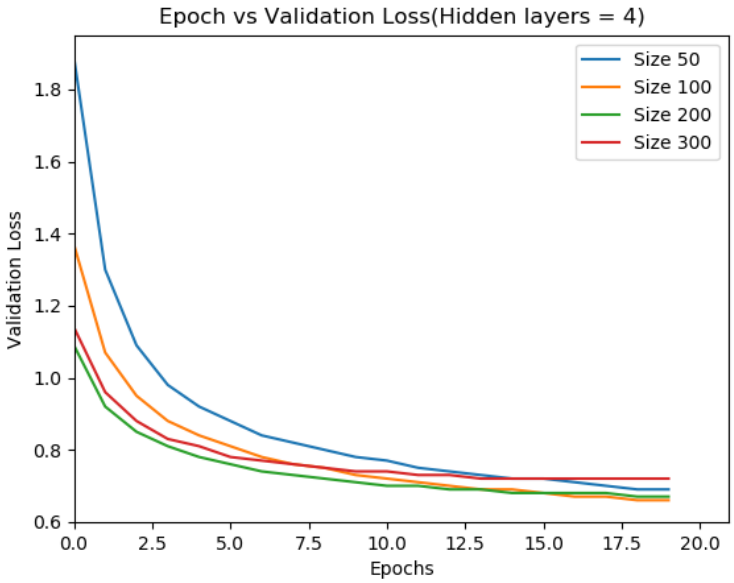
(b) Validation loss at 20 epochs

Figure 3: Loss with size of each hidden layer(50,100,200,300)

1.4 Number of Hidden layers = 4



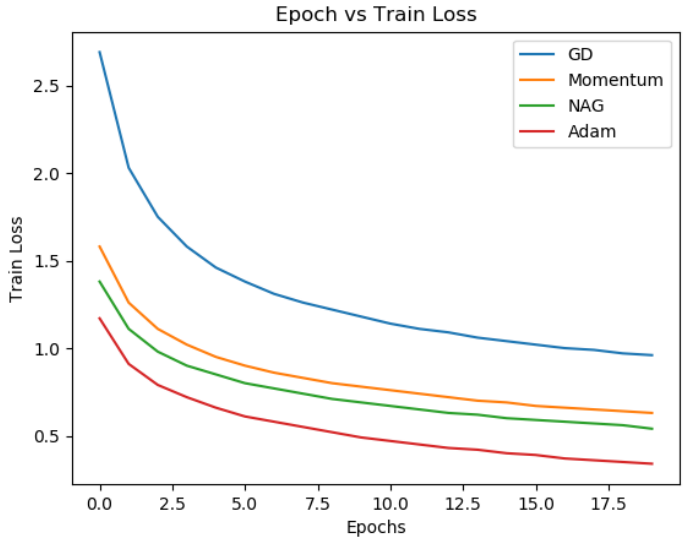
(a) Training loss at 20 epochs



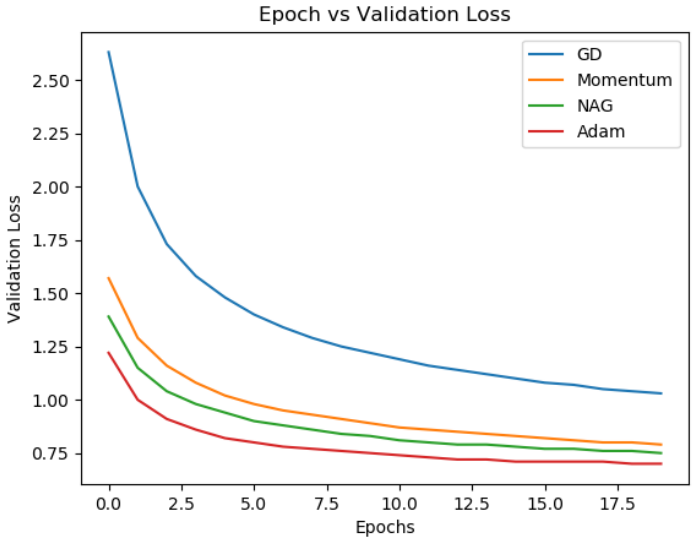
(b) Validation loss at 20 epochs

Figure 4: Loss with size of each hidden layer(50,100,200,300)

2 Epoch vs loss plots for comparing Adam, GD, Momentum and NAG optimizers



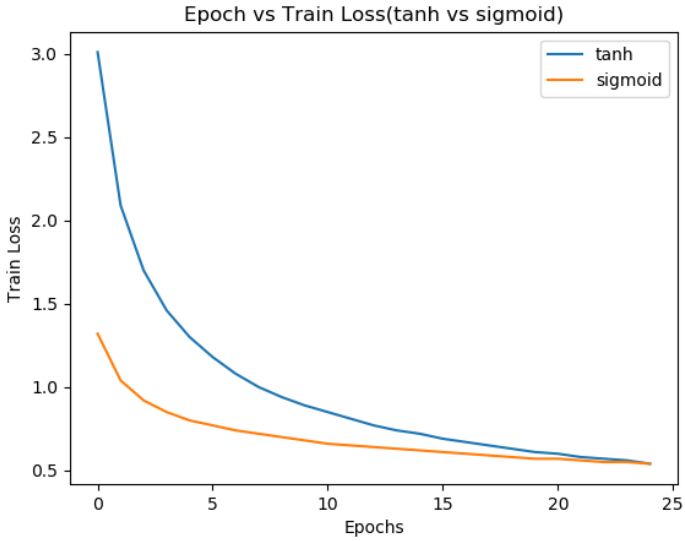
(a) Training loss at 20 epochs



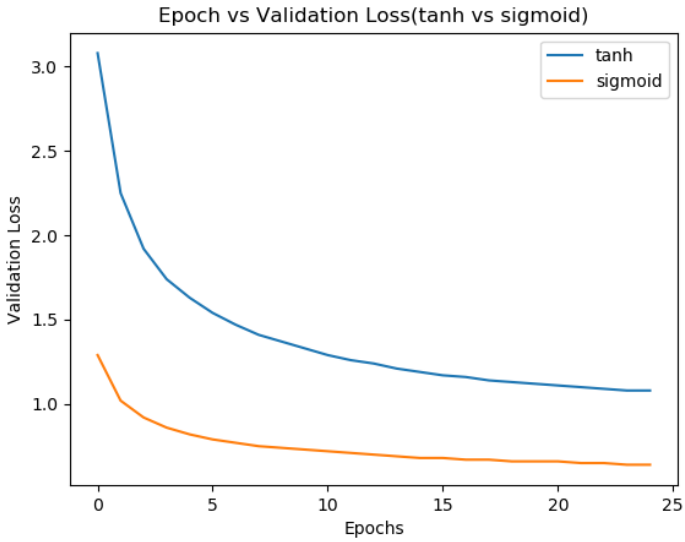
(b) Validation loss at 20 epochs

Figure 5: Comparing optimizers with 2 hidden layers(100 each)

3 Epoch vs Loss plots for comparing Sigmoid and tanh activation



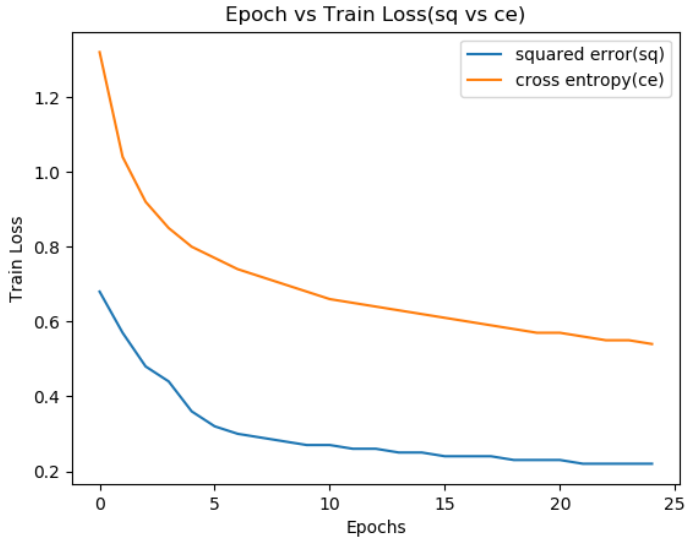
(a) Training loss at 25 epochs



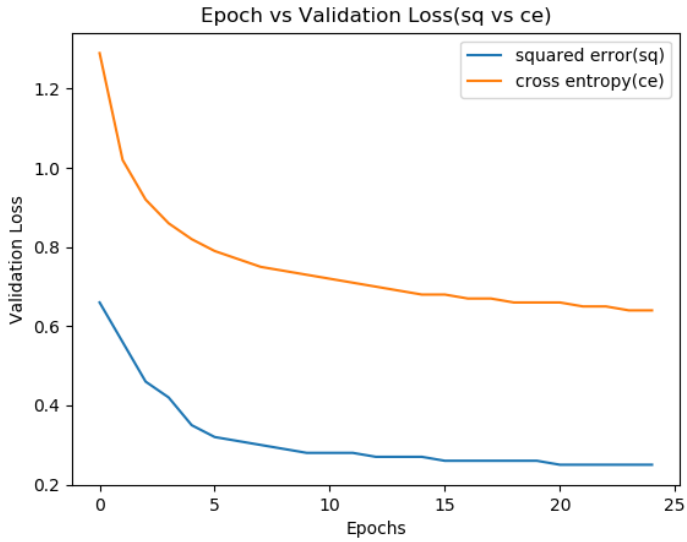
(b) Validation loss at 25 epochs

Figure 6: Sigmoid vs Tanh activation comparison

4 Epoch vs loss plots for comparing Cross entropy and Squared error loss



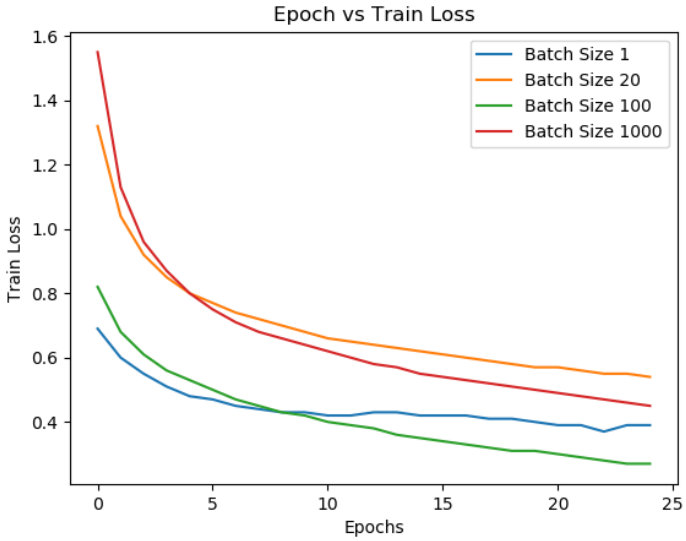
(a) Training loss at 25 epochs



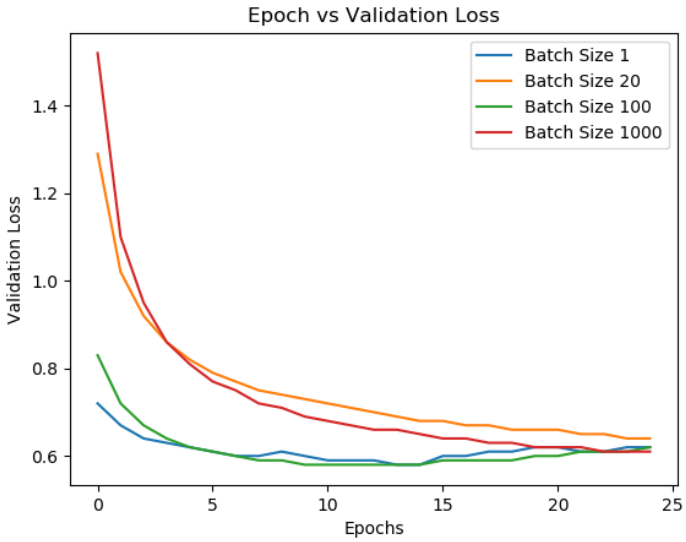
(b) Validation loss at 25 epochs

Figure 7: Comparing Squared error and cross entropy

5 Epoch vs loss plots for different batch sizes



(a) Training loss at 25 epochs



(b) Validation loss at 25 epochs

Figure 8: Comparing losses for different batches