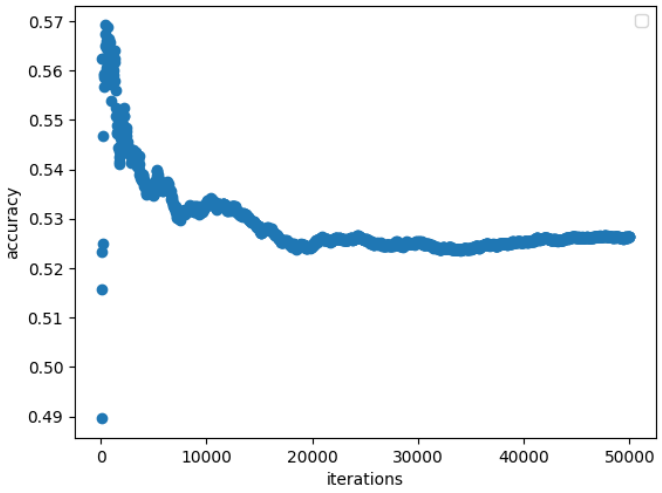
Deep Learning Homework 3
Justin Long

Part 2: Changing of Hyperparameters

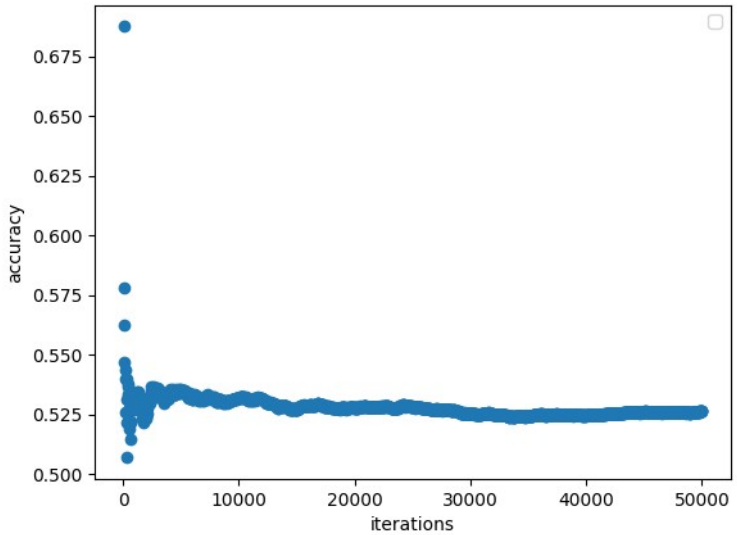
Baseline:

Batch Size: 32
Hidden Size: 3048
Learning Rate: 0.0001
Wight Decay: 0.01
Epochs: 50

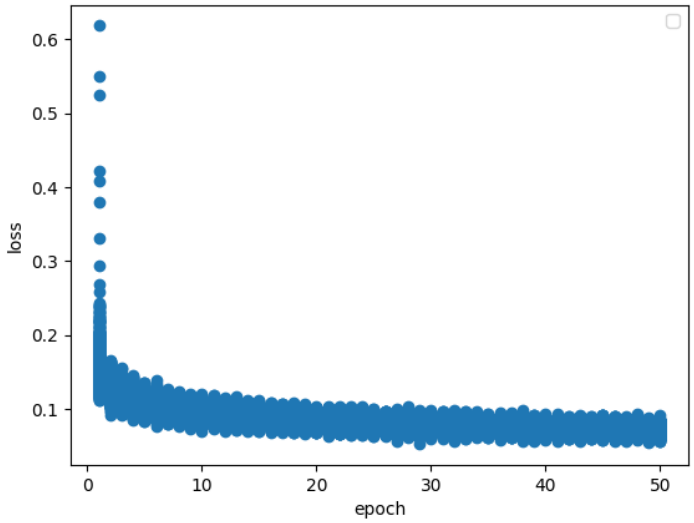
Accuracy On Training:



Accuracy On Test:



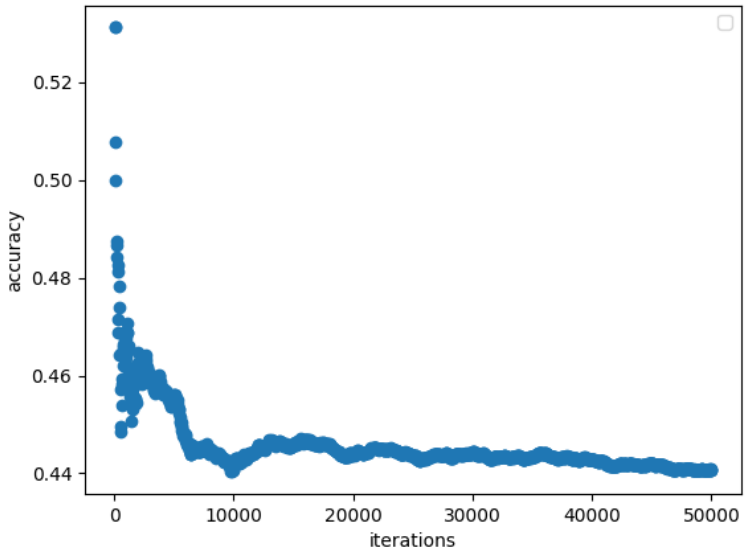
Loss on Training:



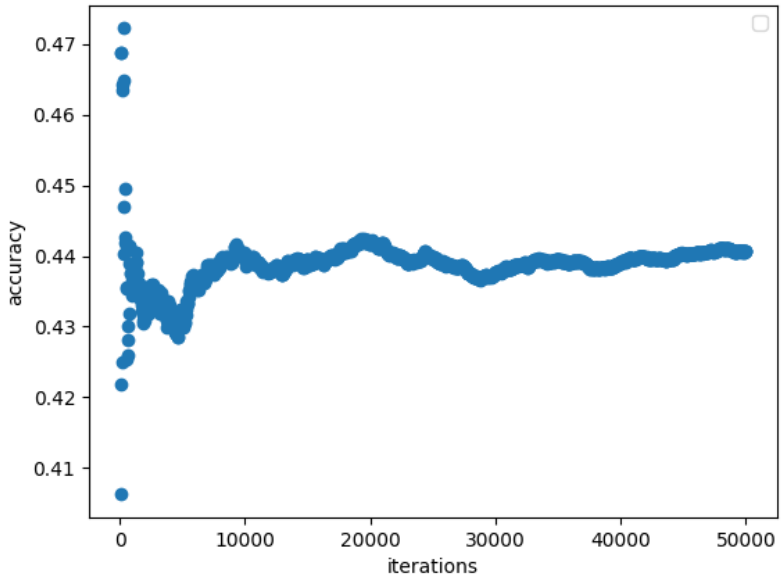
Parameter 1: Hidden Unit Size

Test 1:
Accuracy of the network on the 10000 images: 44.07 %
Batch Size: 32
Hidden Size: 1548
Learning Rate: 0.0001
Wight Decay: 0.01
Epochs: 50

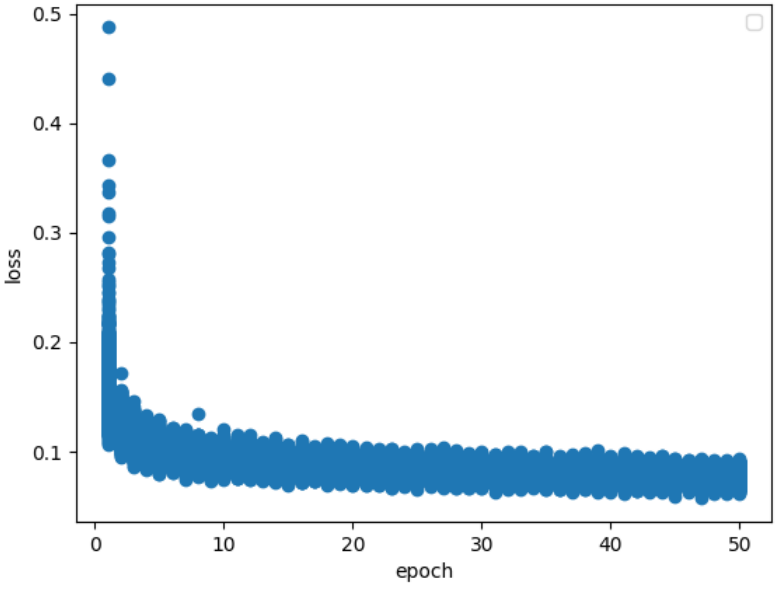
Accuracy On Training:



Accuracy On Test:

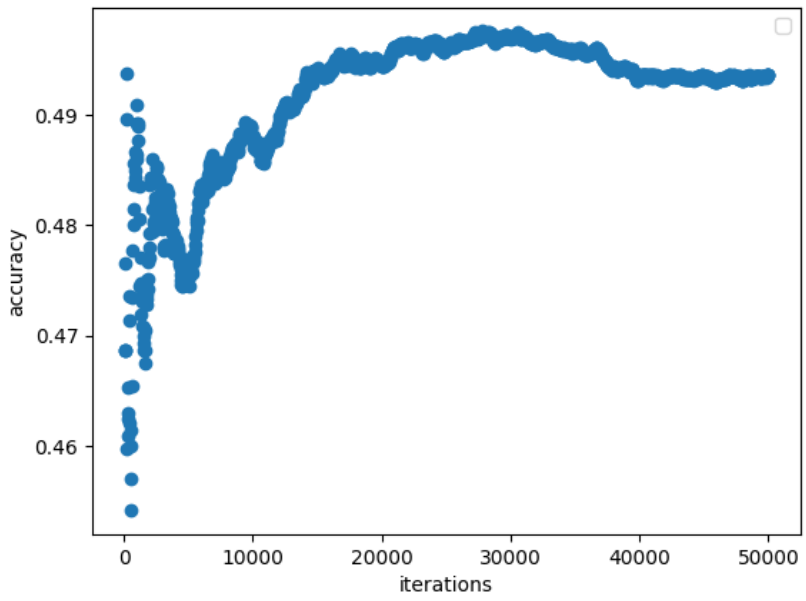


Loss:

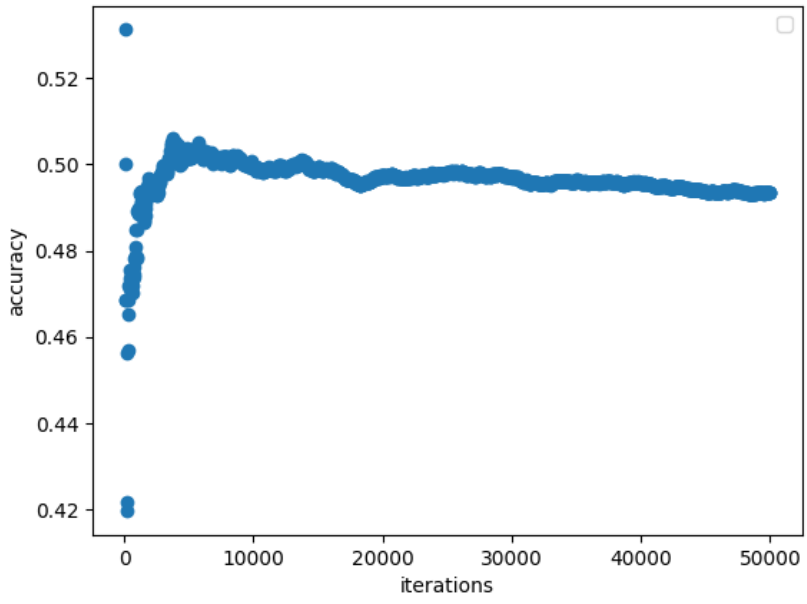


Test 2:
Accuracy of the network on the 10000 test images: 49.364 %
Batch Size: 32
Hidden Size: 2548
Learning Rate: 0.0001
Wight Decay: 0.01
Epochs: 50

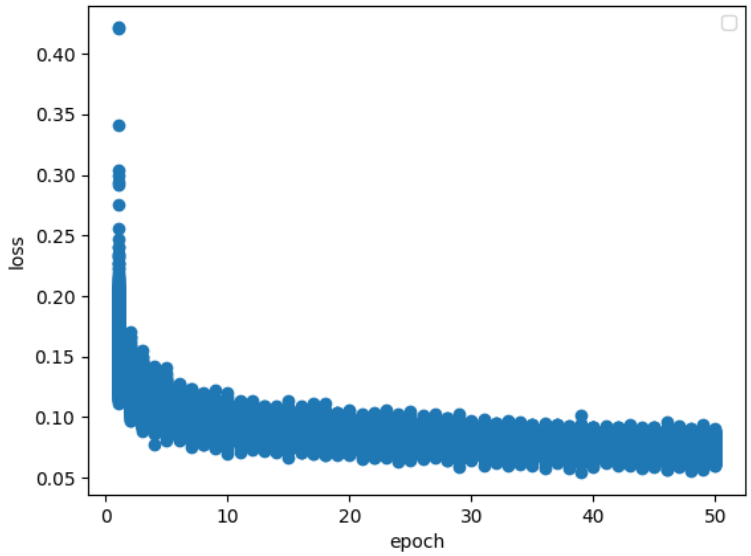
Accuracy on Training:



Accuracy on Test:



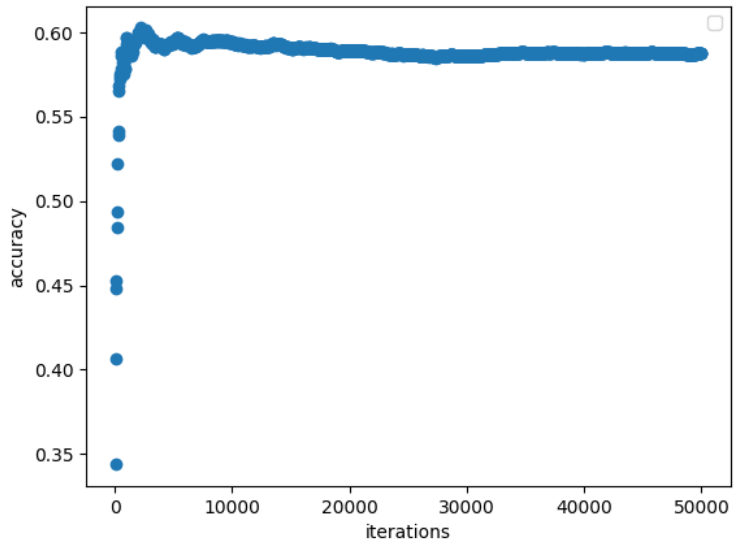
Training Loss:



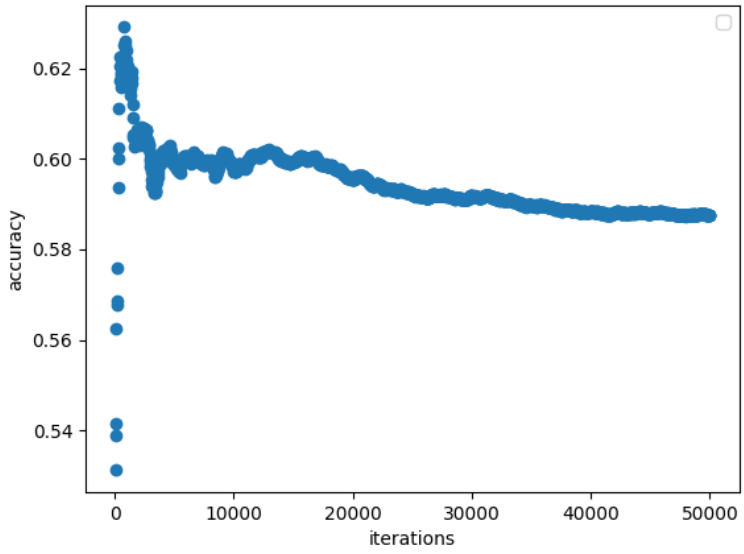
Test 3:

Accuracy of the network on the 10000 test images: 58.768 %
Batch Size: 32
Hidden Size: 4548
Learning Rate: 0.0001
Wight Decay: 0.01
Epochs: 50

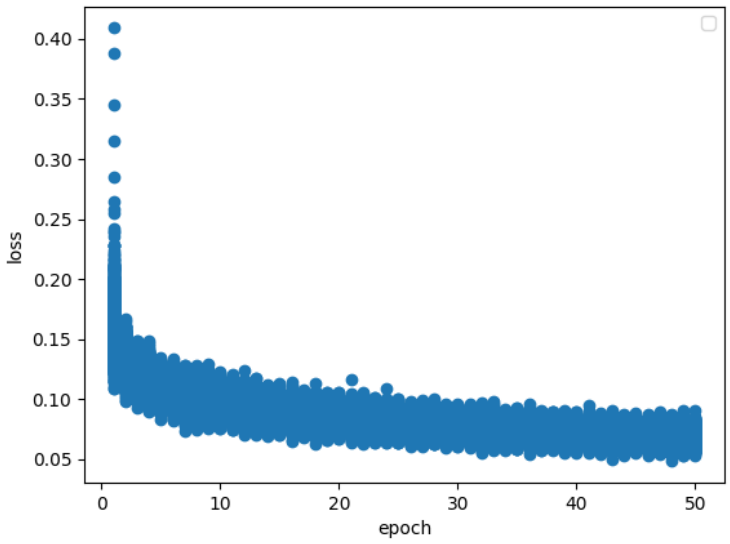
Accuracy on Training:



Accuracy on Testing:



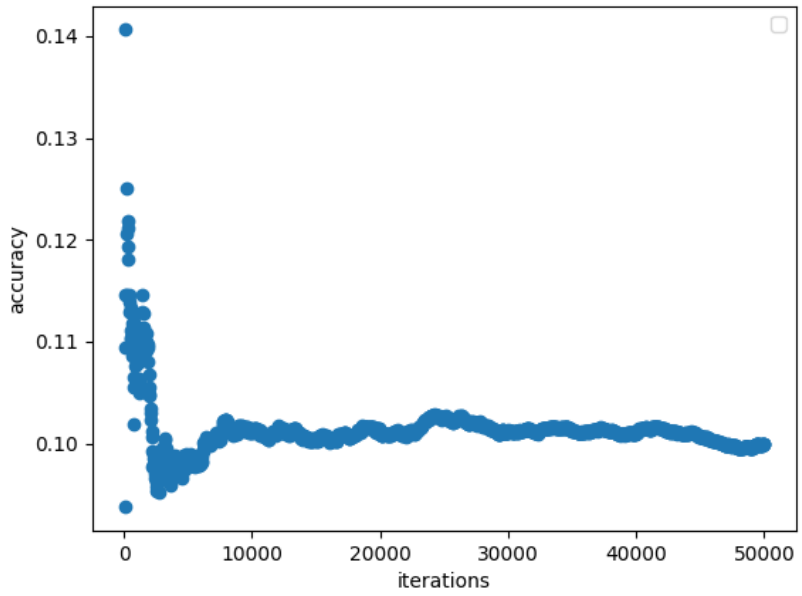
Loss on Training:



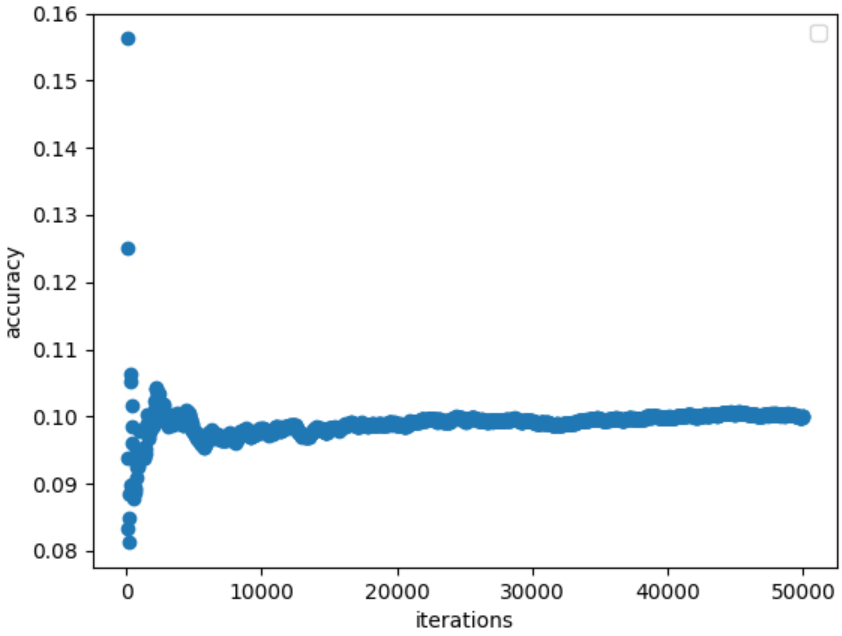
Parameter 2: Learning Rate

Test 1
Accuracy of the network on the 10000 test images: 10.0 %
Batch Size: 32
Hidden Size: 3548
Learning Rate: 0.01
Wight Decay: 0.01
Epochs: 50

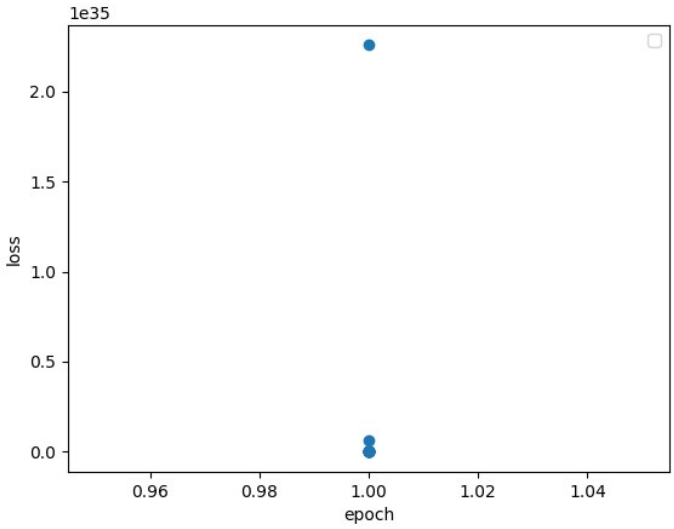
Accuracy on Training:



Accuracy on Testing:

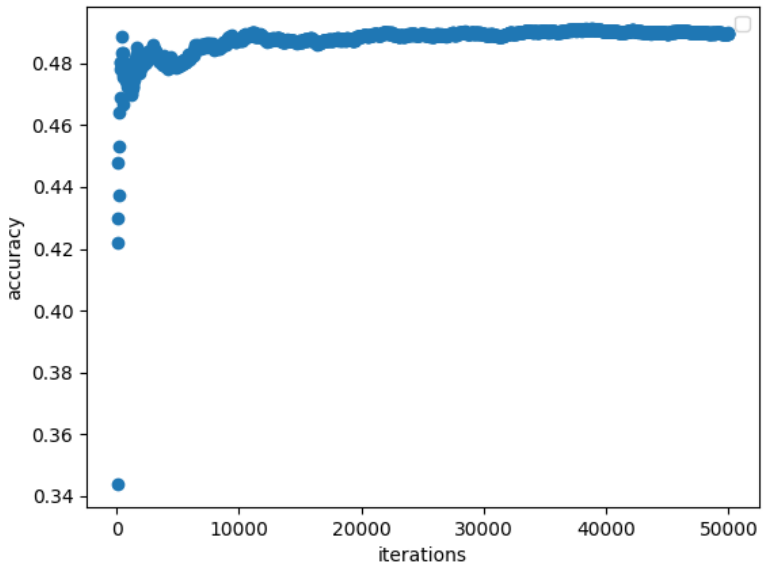


Training Loss:

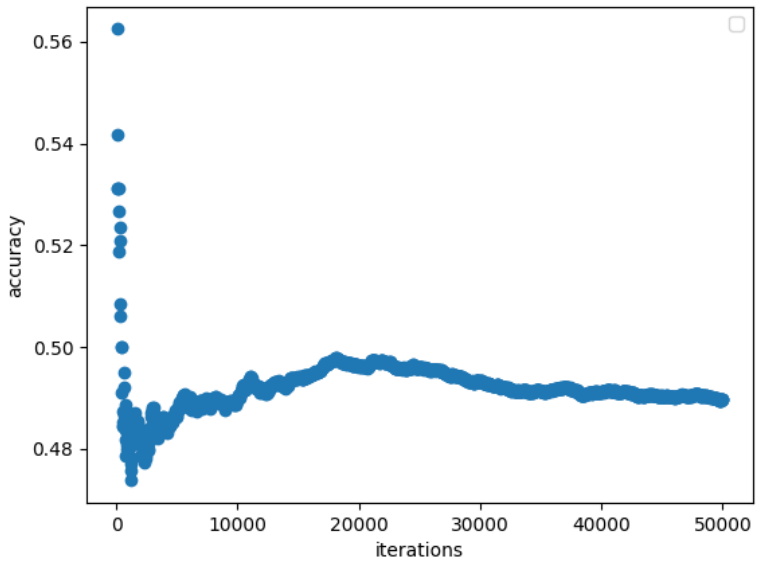


Test 2
Accuracy of the network on the 10000 test images: 48.976 %
Batch Size: 32
Hidden Size: 3548
Learning Rate: 0.001
Wight Decay: 0.01
Epochs: 50

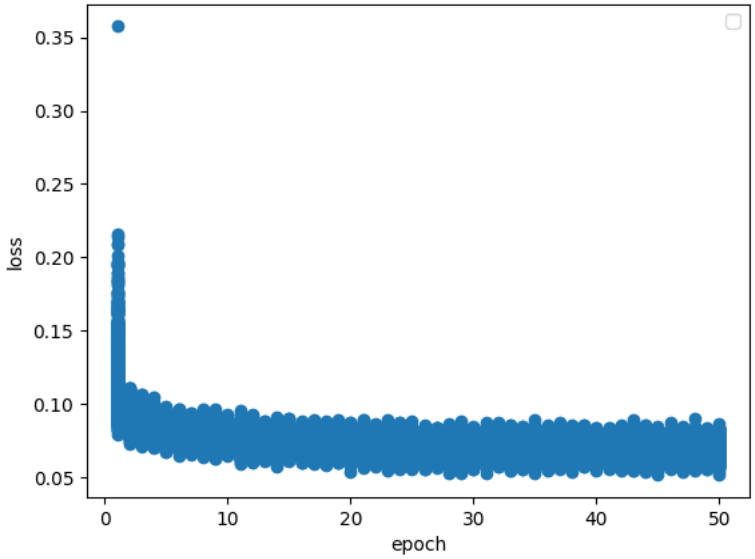
Accuracy on Training:



Accuracy on Test:



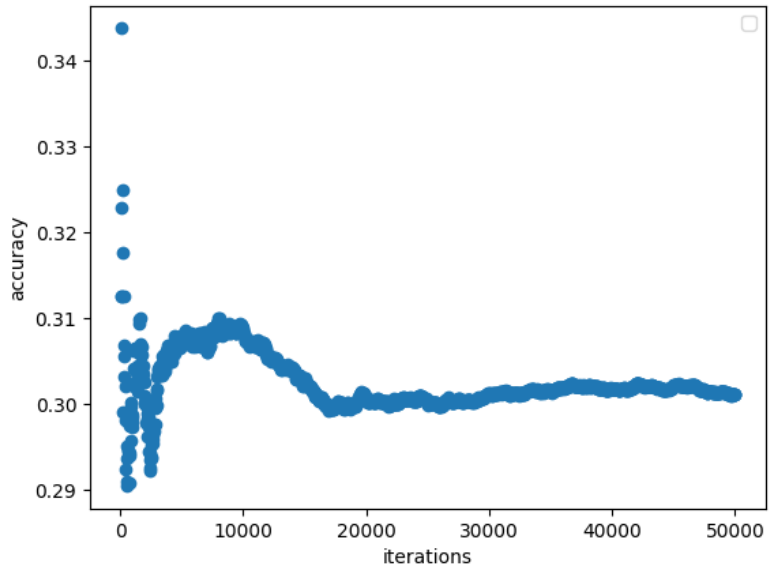
Training Loss:



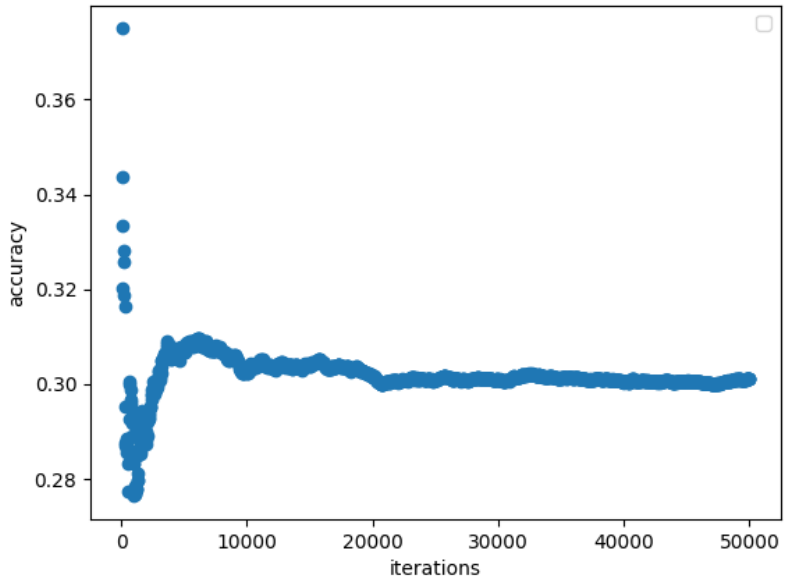
Test 3:

Accuracy of the network on the 10000 test images: 30.11 %
Training Phase Finished
Batch Size: 32
Hidden Size: 3548
Learning Rate: 1e-05
Wight Decay: 0.01
Epochs: 50

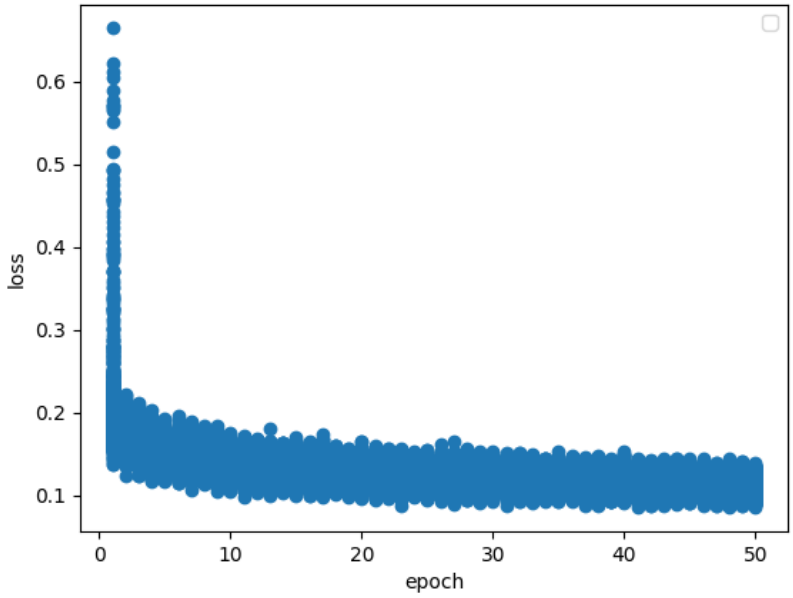
Training Accuracy:



Testing Accuracy:



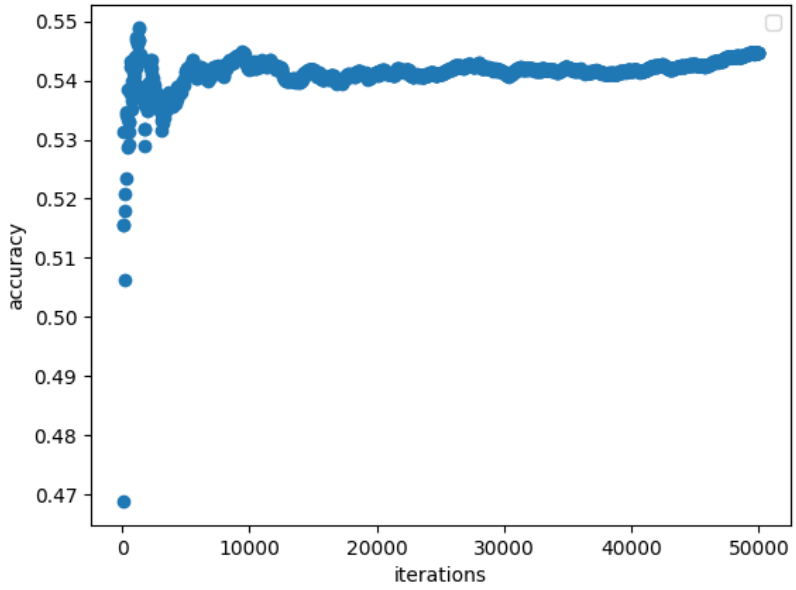
Training Loss:



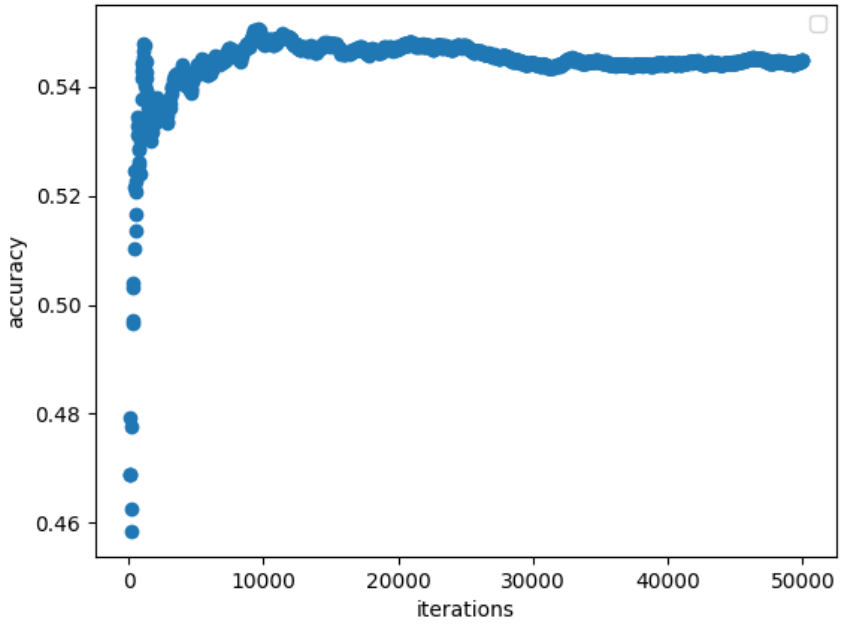
Parameter 3: Weight Decay

Test 1
Accuracy of the network on the 10000 test images: 54.48 %
Batch Size: 32
Hidden Size: 3548
Learning Rate: 0.0001
Wight Decay: 0.1
Epochs: 50

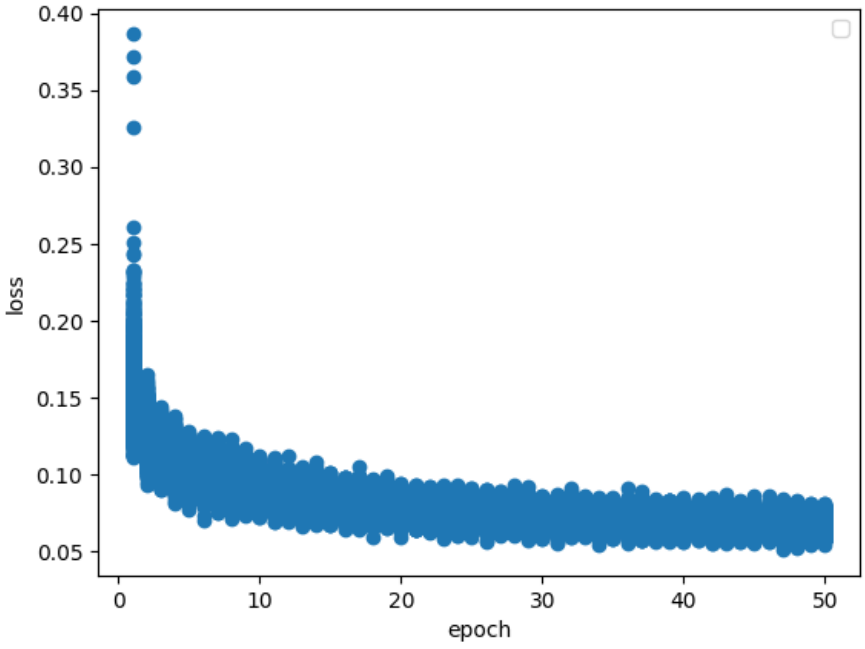
Training Accuracy:



Testing Accuracy:



Training Loss:

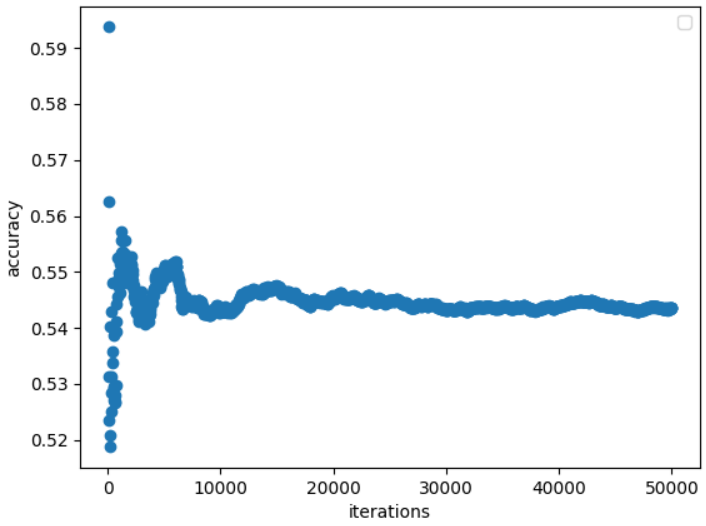


Test 2

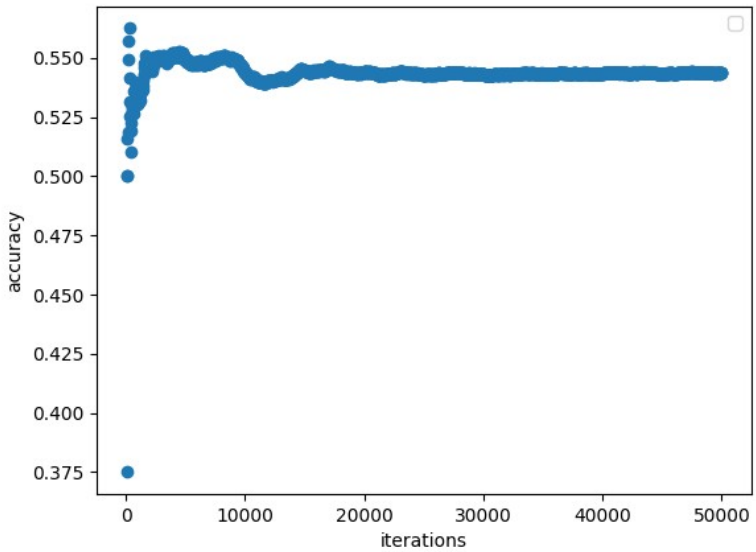
Accuracy of the network on the 10000 test images: 54.364 %

Batch Size: 32
Hidden Size: 3548
Learning Rate: 0.0001
Wight Decay: 0.001
Epochs: 50

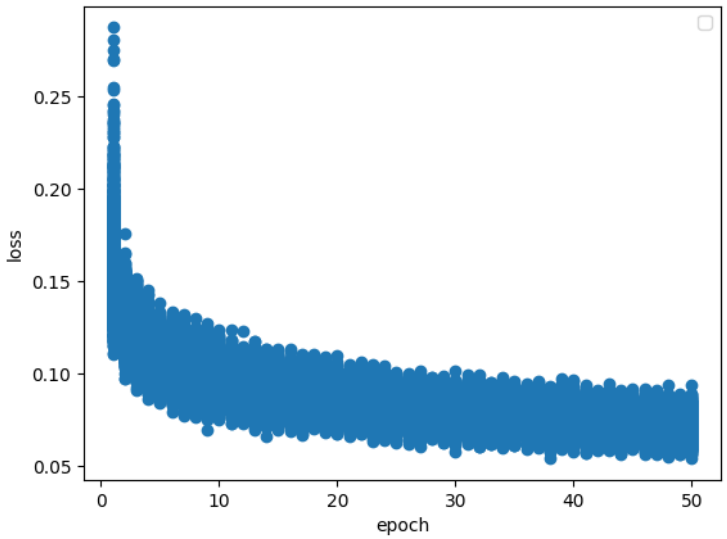
Train Accuracy:



Test Accuracy:



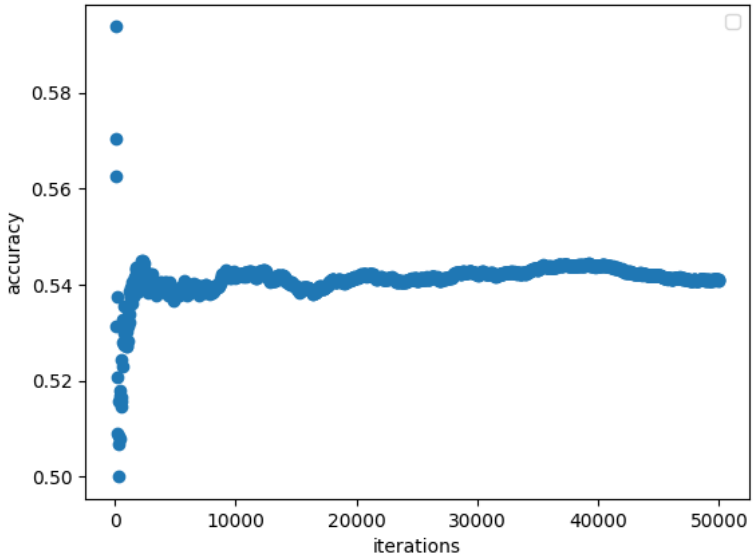
Training Loss:



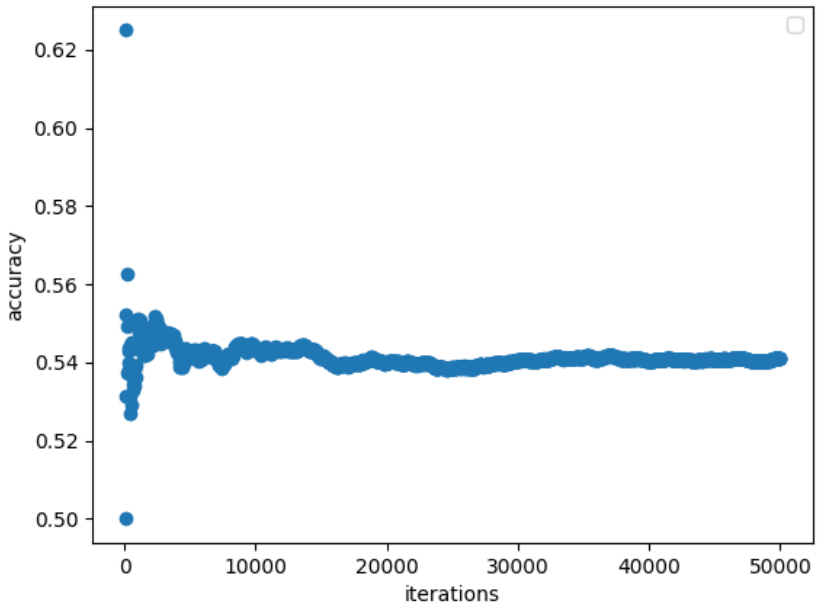
Test 3

Accuracy of the network on the 10000 test images: 54.092 %
Batch Size: 32
Hidden Size: 3548
Learning Rate: 0.0001
Wight Decay: 0.0001
Epochs: 50

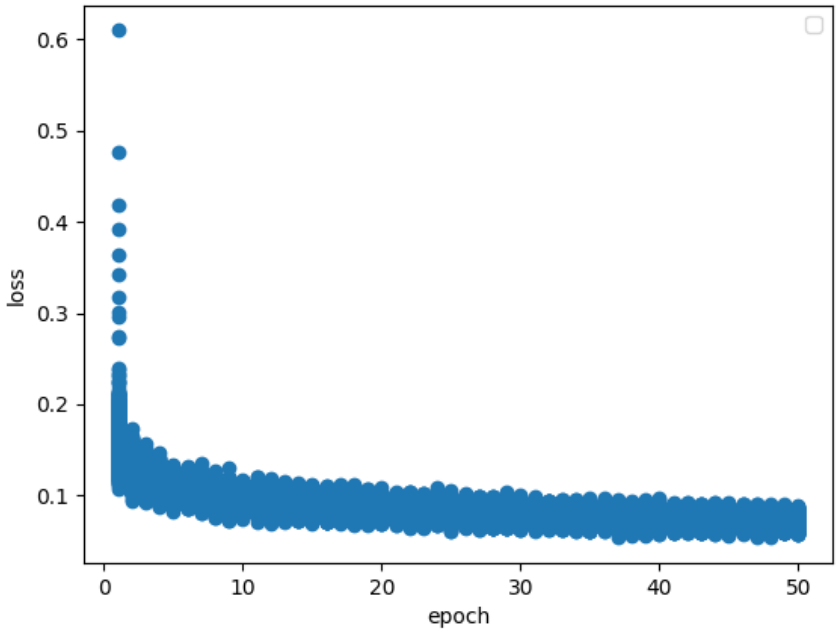
Train Accuracy:



Test Accuracy:



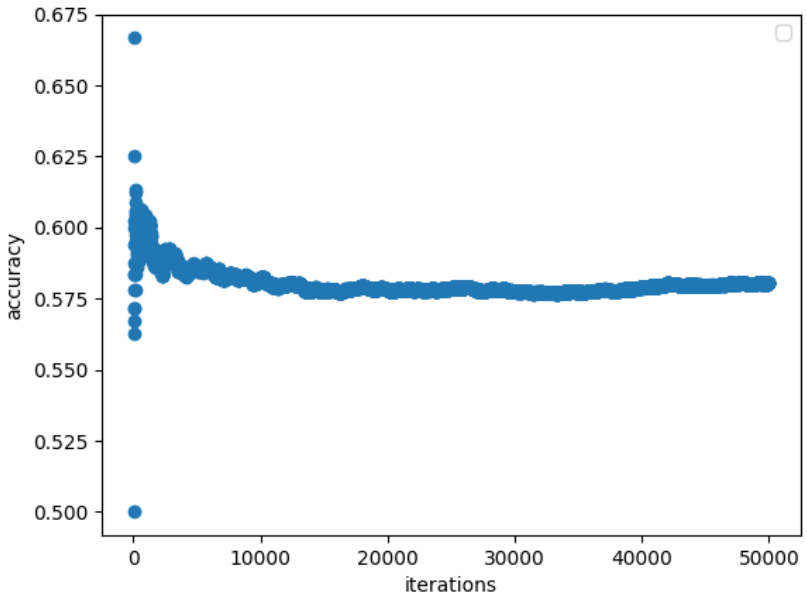
Training Loss:



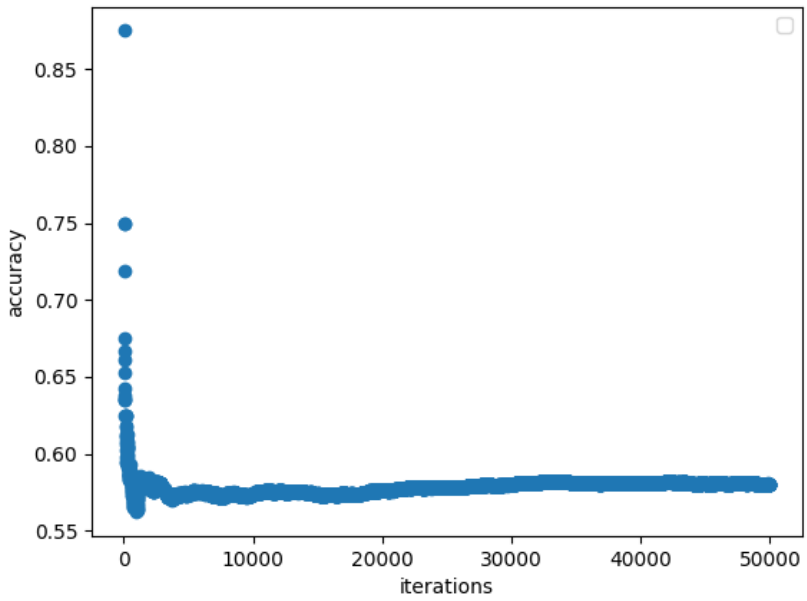
Parameter 4: Batch Size

Test 1
Accuracy of the network on the 10000 test images: 58.044 %
Batch Size: 8
Hidden Size: 3548
Learning Rate: 0.0001
Wight Decay: 0.01
Epochs: 50

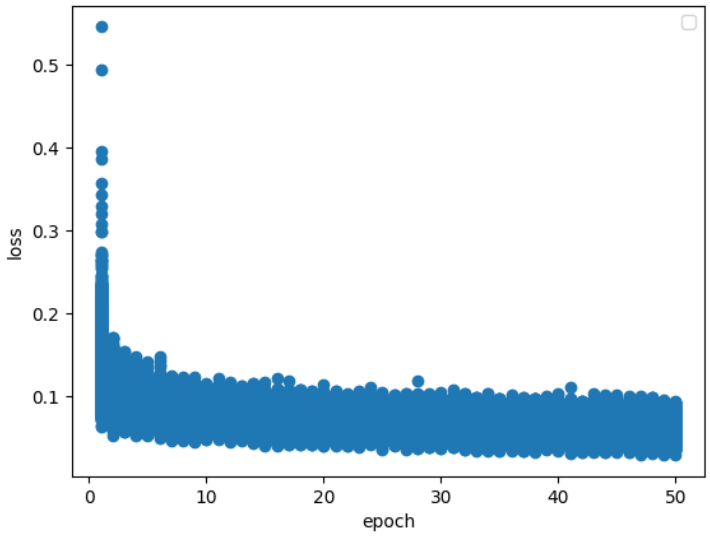
Training Accuracy:



Testing Accuracy:



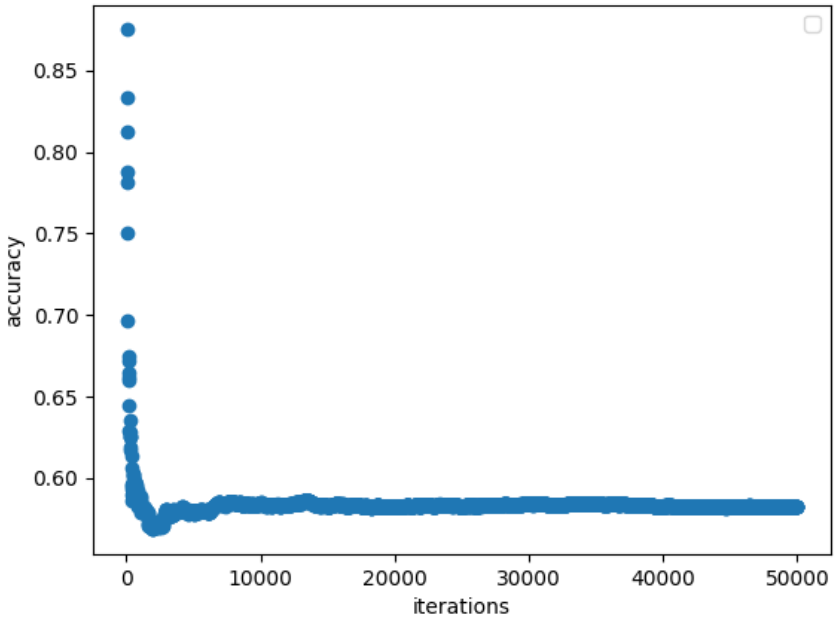
Training Loss:



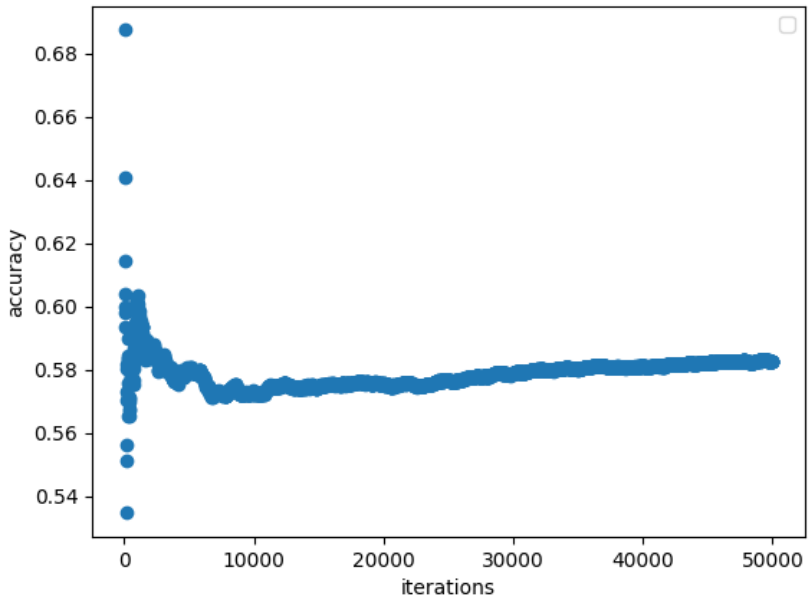
Test 2

Accuracy of the network on the 10000 test images: 58.27 %
Batch Size: 16
Hidden Size: 3548
Learning Rate: 0.0001
Wight Decay: 0.01
Epochs: 50

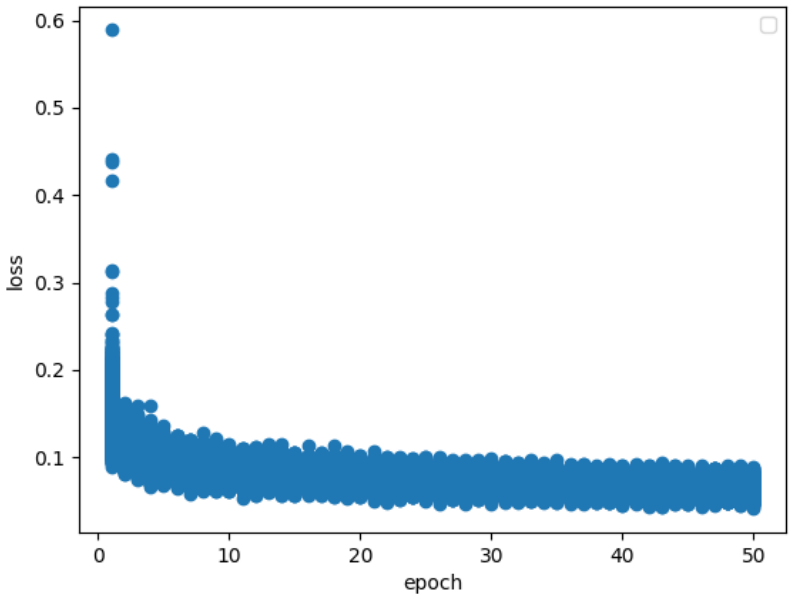
Training Accuracy:



Test Accuracy:

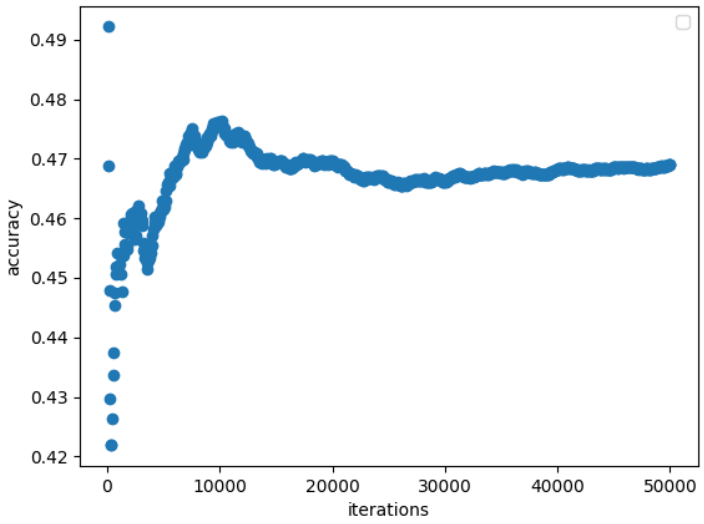


Training Loss:

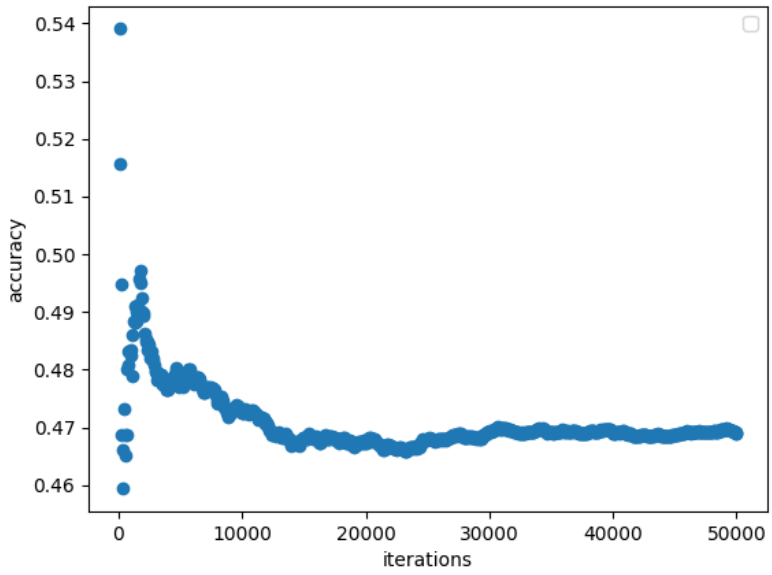


Test 3
Accuracy of the network on the 10000 test images: 46.9 %
Batch Size: 64
Hidden Size: 3548
Learning Rate: 0.0001
Wight Decay: 0.01
Epochs: 50

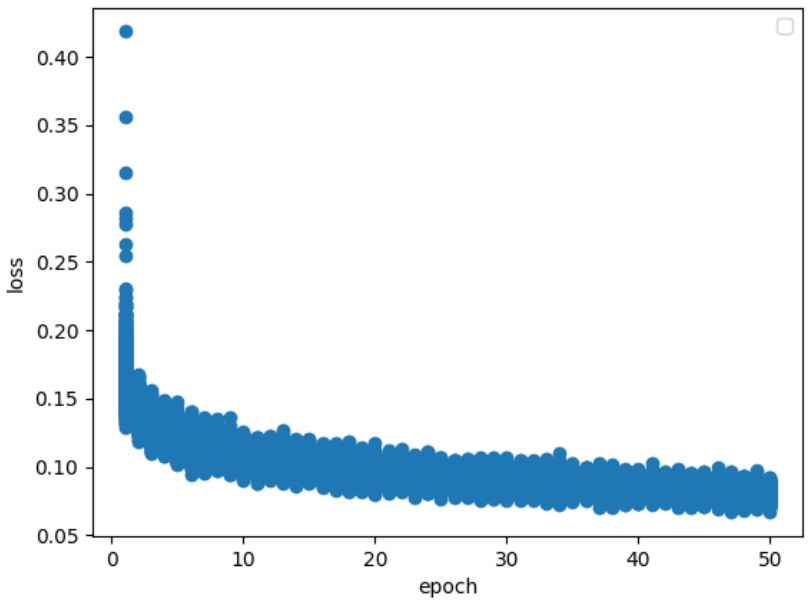
Training Accuracy:



Test Accuracy:



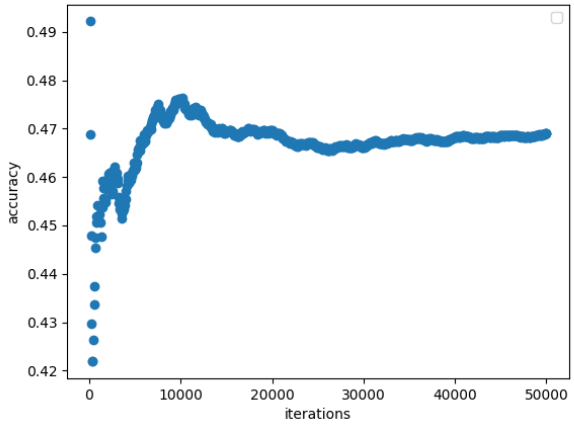
Training Loss:



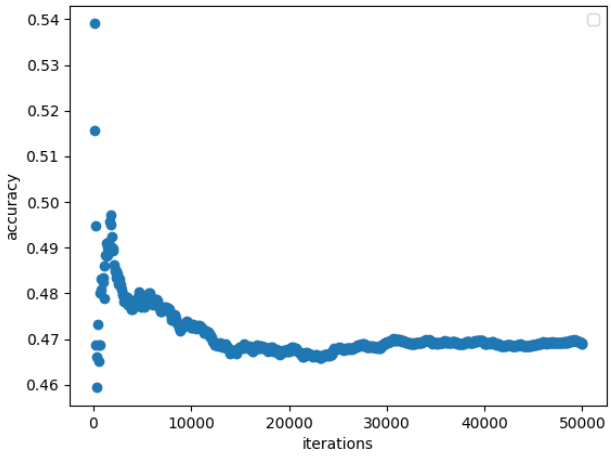
Part 3:

Feature Extraction
BATCH_SIZE = 32
HIDDEN_SIZE = 3548
DROPOUT = None
LEARNING_RATE = 0.0001
WEIGHT_D = 0.01
EPOCHS = 25

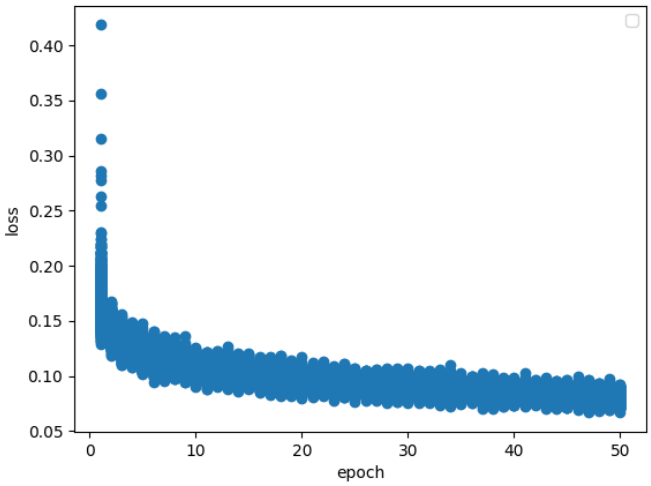
Training Accuracy:



Test Accuracy:

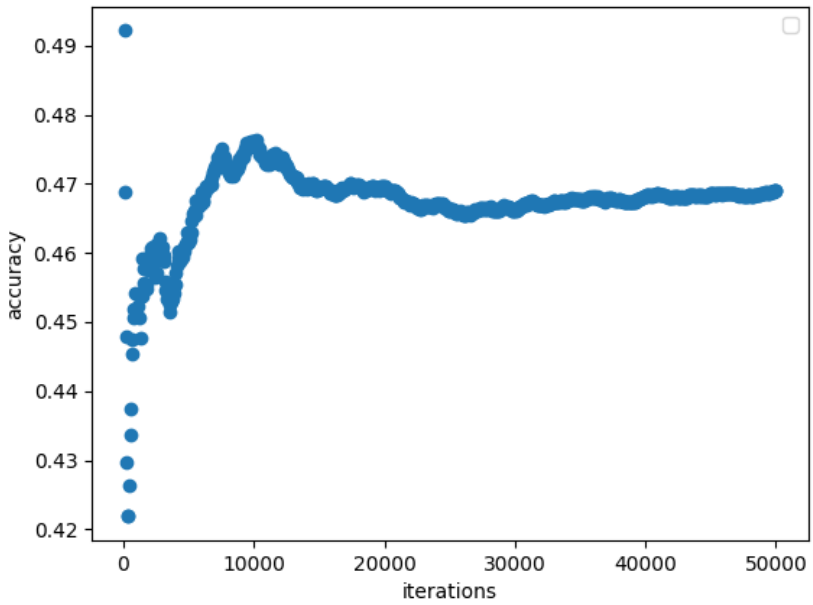


Loss Training:

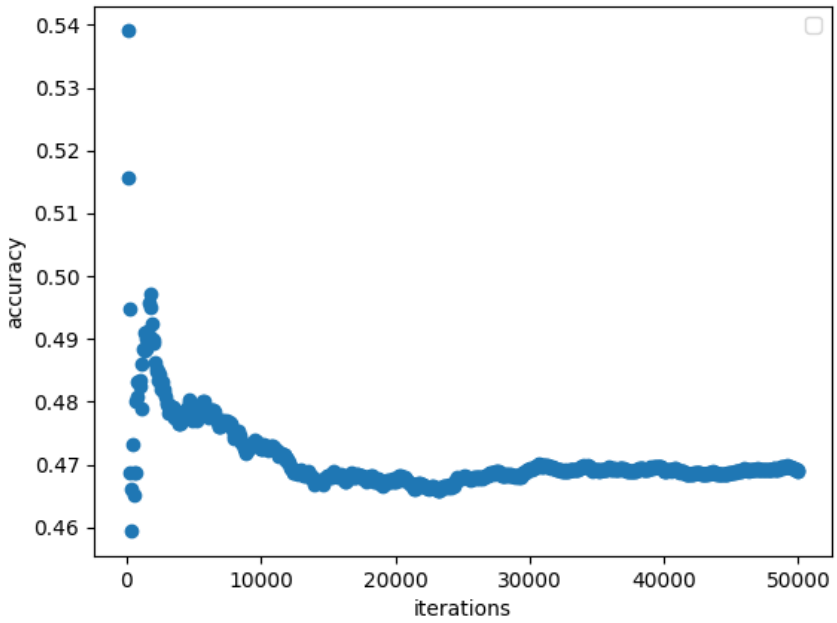


Fine Tuning
BATCH_SIZE = 32
HIDDEN_SIZE = 3548
DROPOUT = None
LEARNING_RATE = 0.000001
WEIGHT_D = 0.01
EPOCHS = 25

Training Accuracy:



Testing Accuracy:



Training Loss: