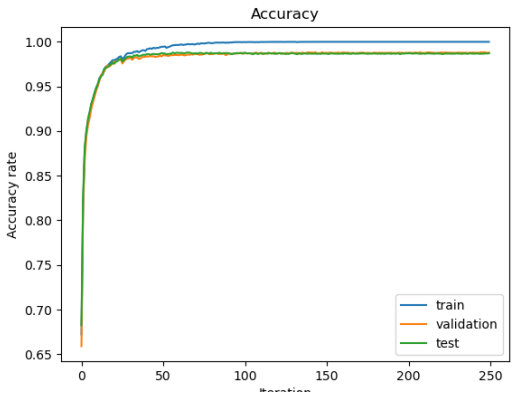
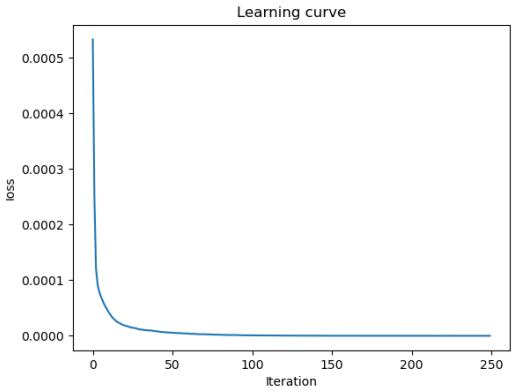
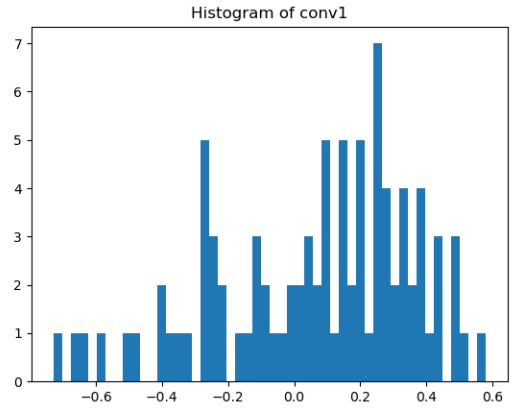
DEEP LEARNING (Fall 2020)

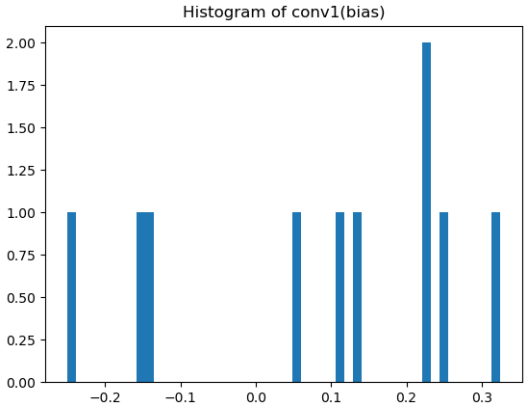
Homework 1

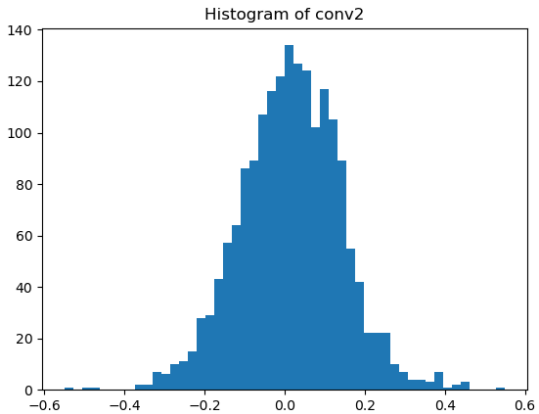
1-1

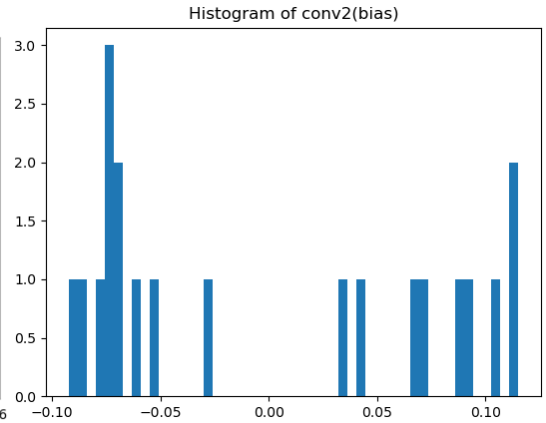


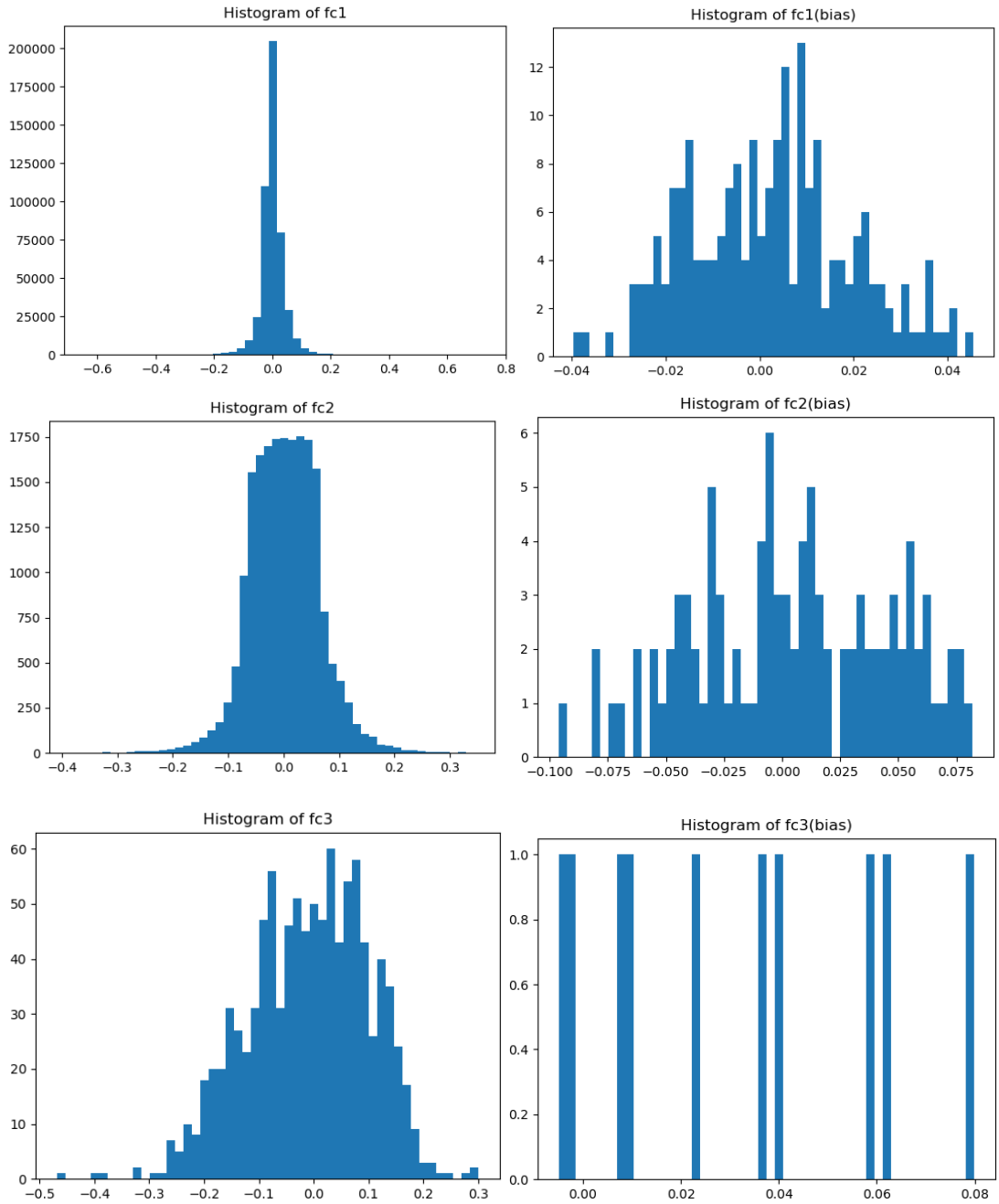










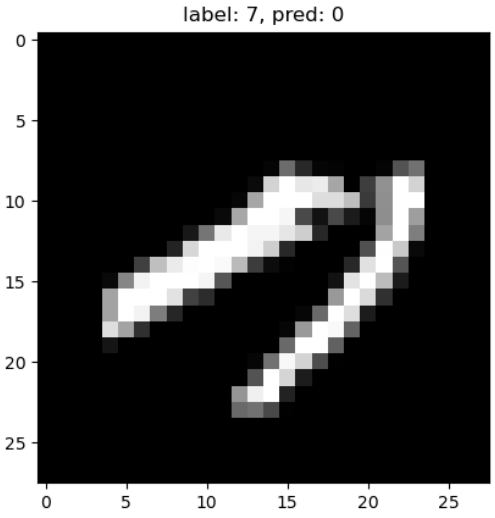


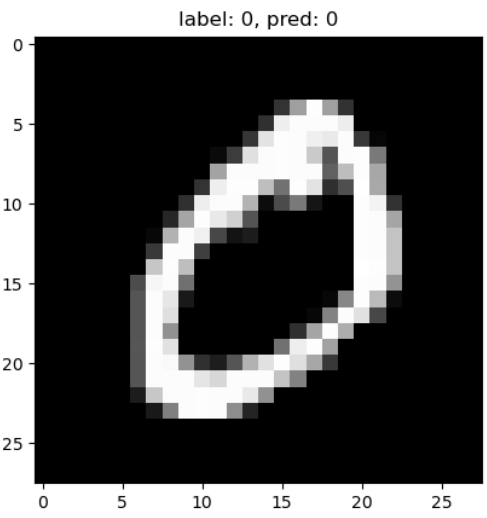
Architecture:

Inputs -> (channels=10, filter size=(3x3), stride=1)
-> (channels=20, filter size=(3x3), stride=1)
-> FCN(nodes=200) -> FCN(nodes=100) -> FCN(nodes=10)

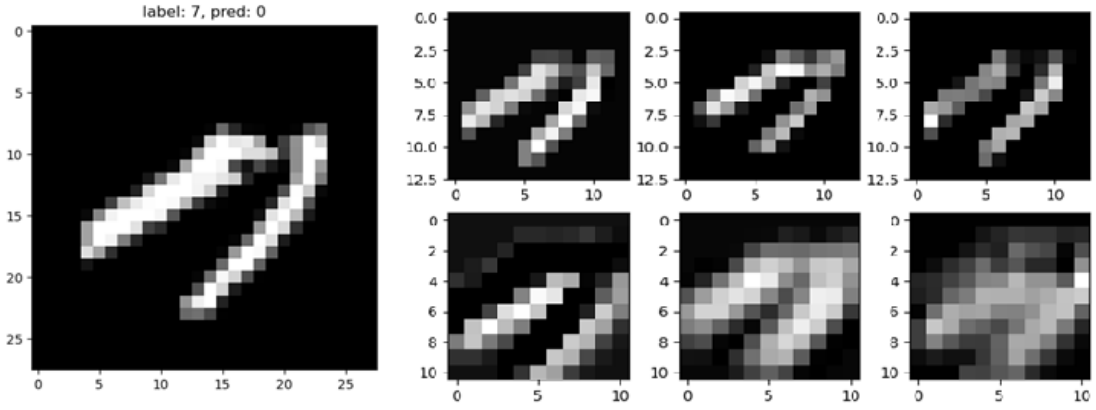
The stride size and filter size are also hyperparameters, like number of nodes in FCN, so it's not easy to tell the difference, but obviously, both of them affect the size of the output images.

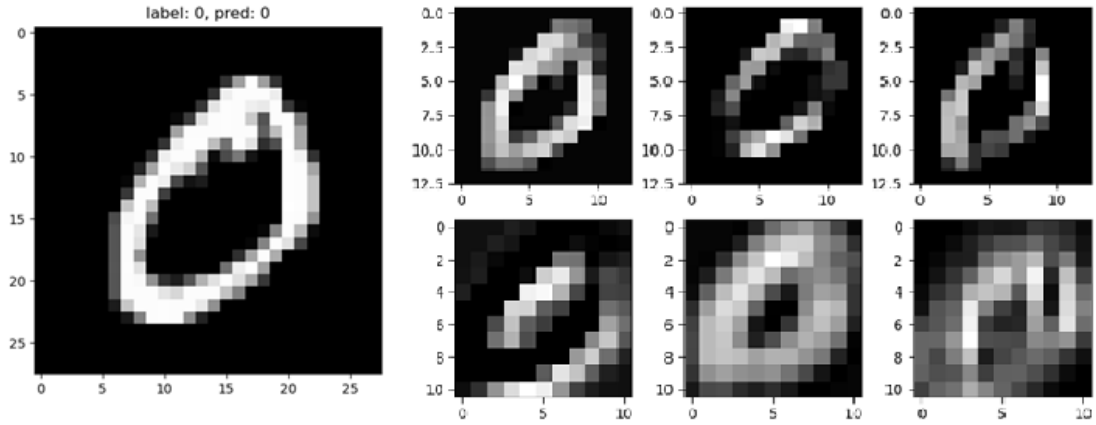
1-2



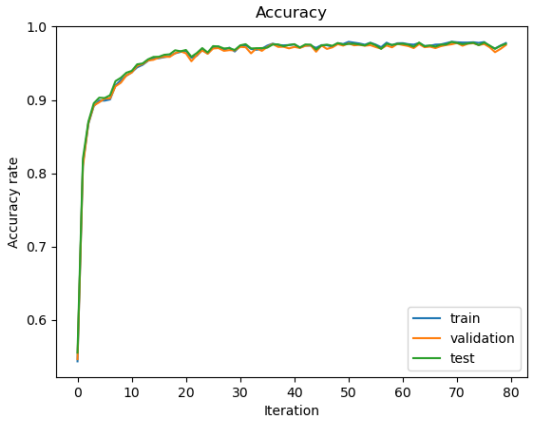


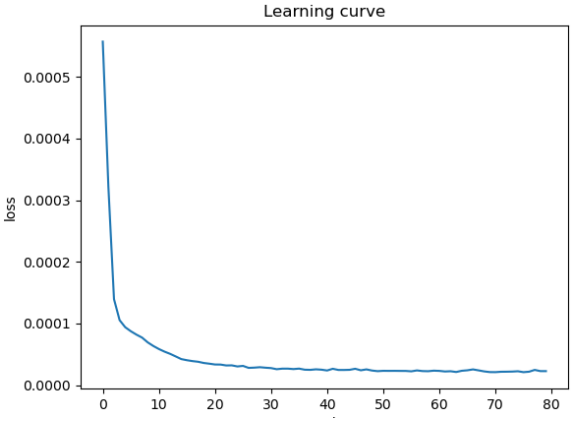
1-3

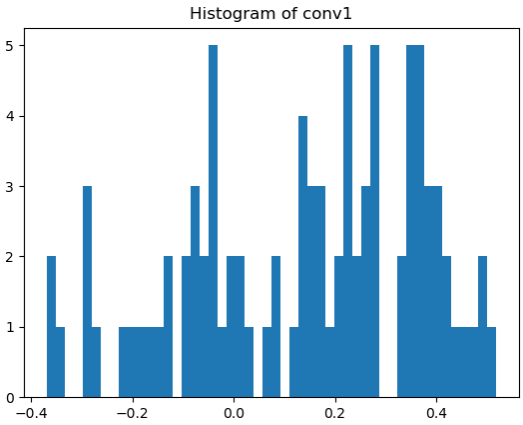


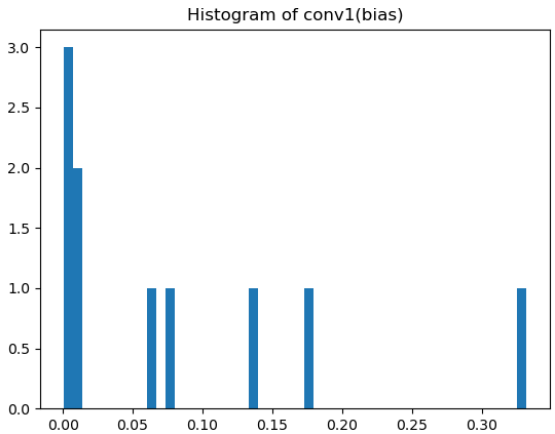


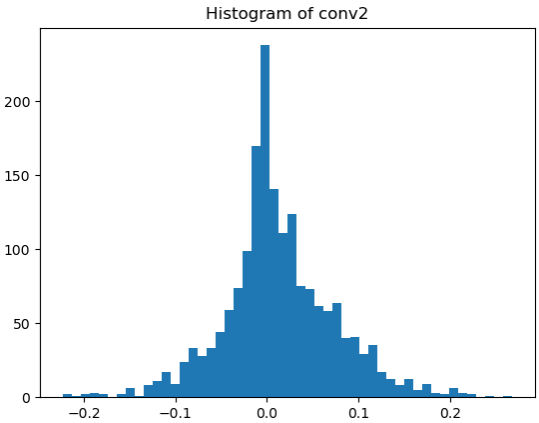
1-4

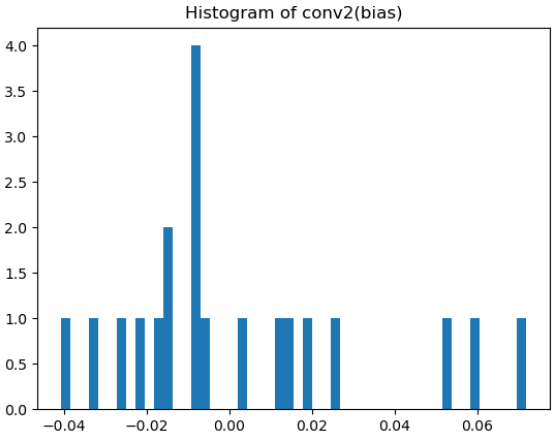

Accuracy
Accuracy rate
Iteration
train
validation
test

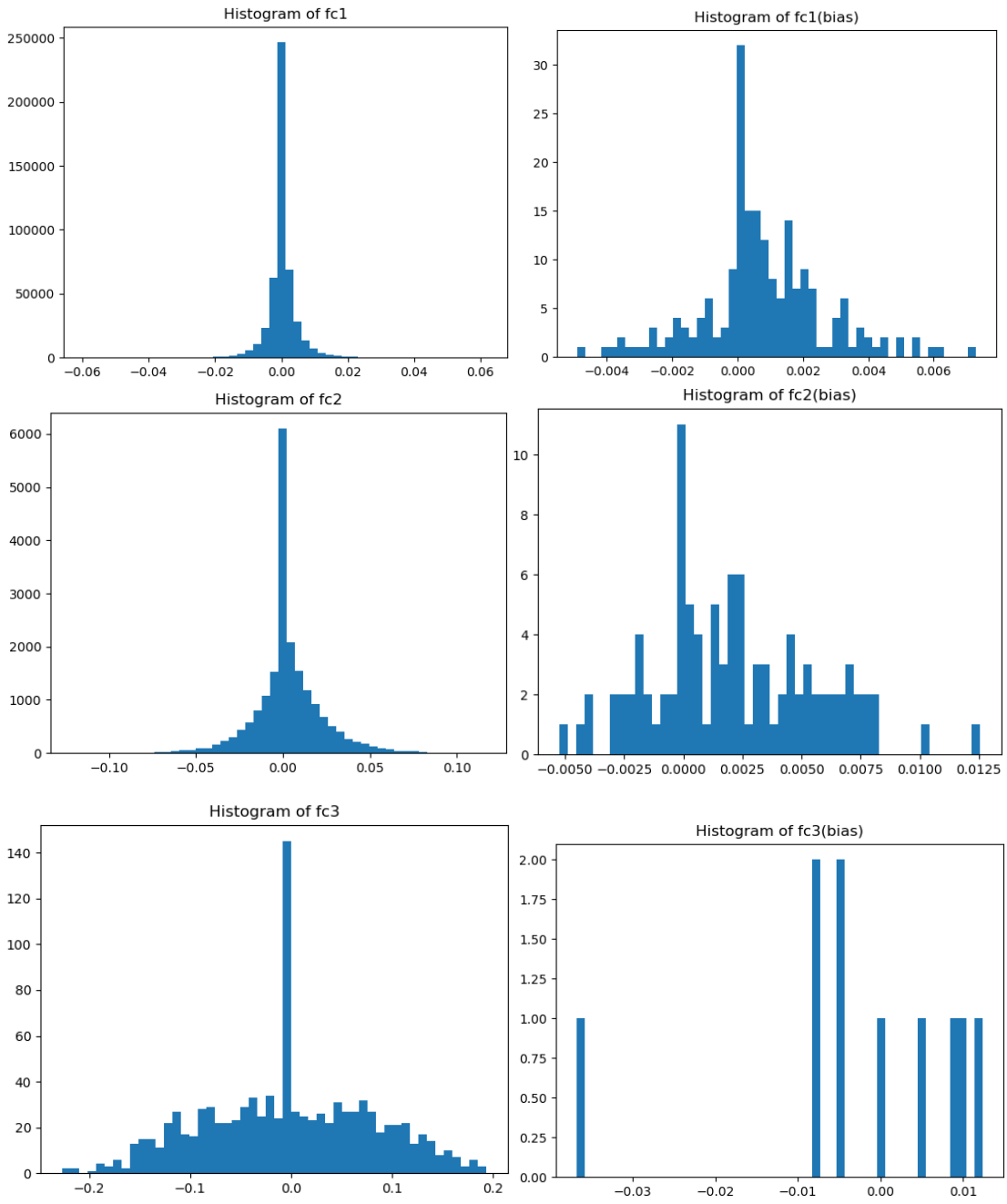

Learning curve
loss


Histogram of conv1

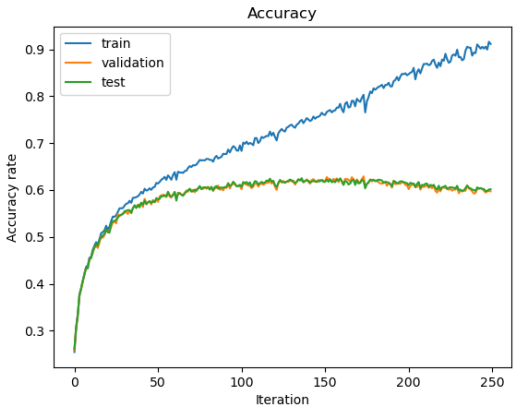

Histogram of conv1(bias)

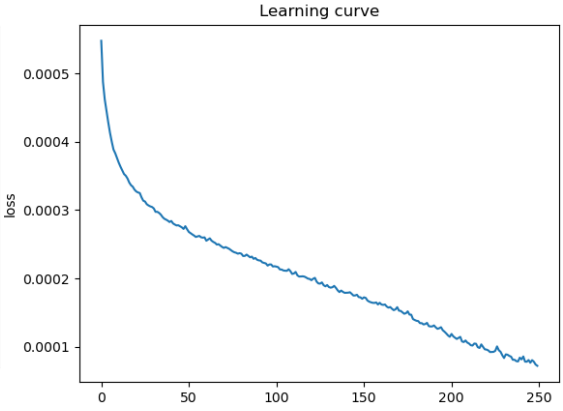

Histogram of conv2

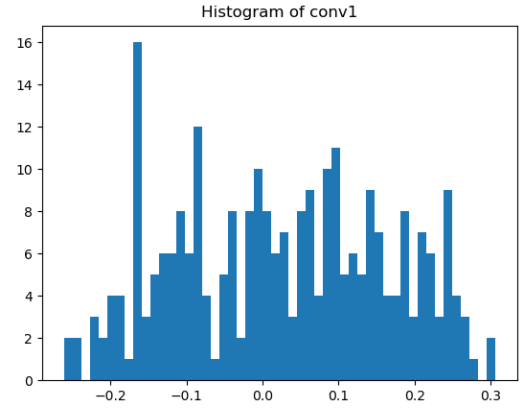

Histogram of conv2(bias)

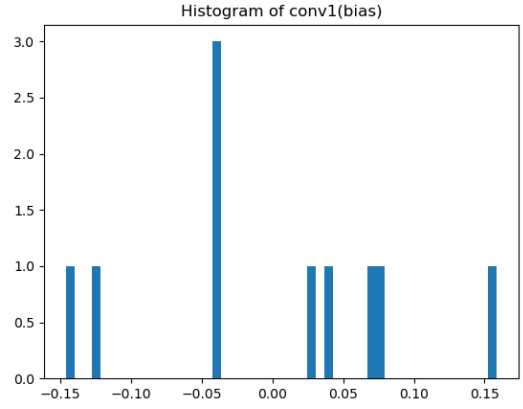

Histogram of fc1
Histogram of fc1(bias)
Histogram of fc2
Histogram of fc2(bias)
Histogram of fc3
Histogram of fc3(bias)

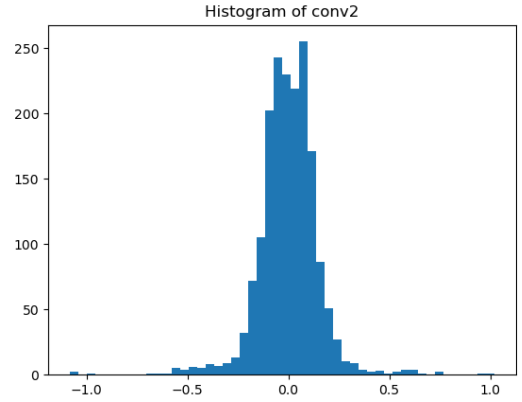
2-1

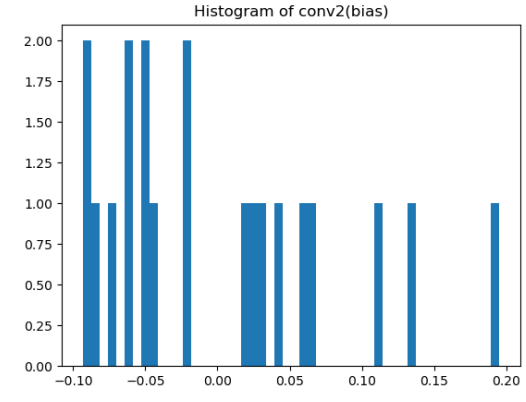

Accuracy
train
validation
test
Accuracy rate
Iteration

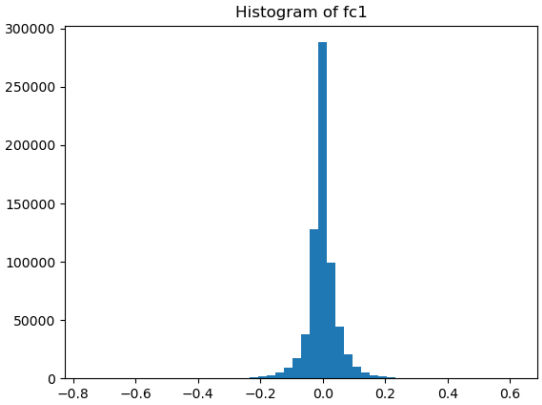

Learning curve
loss

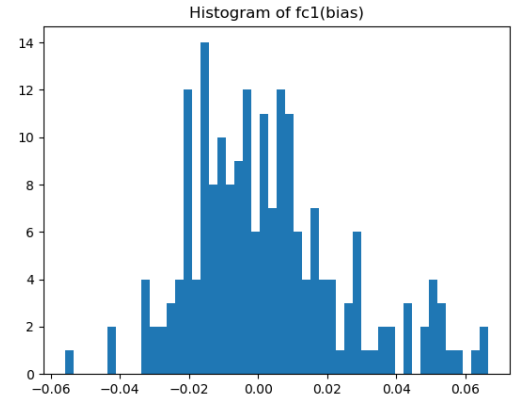

Histogram of conv1

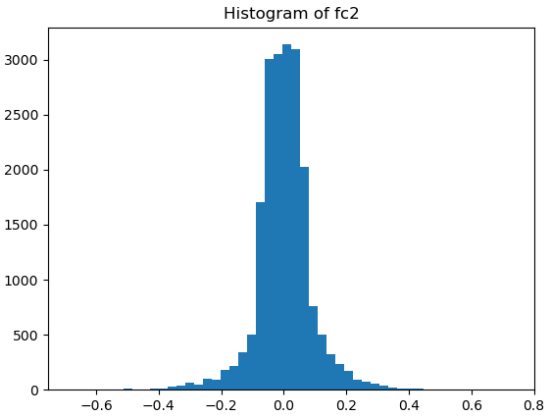

Histogram of conv1(bias)

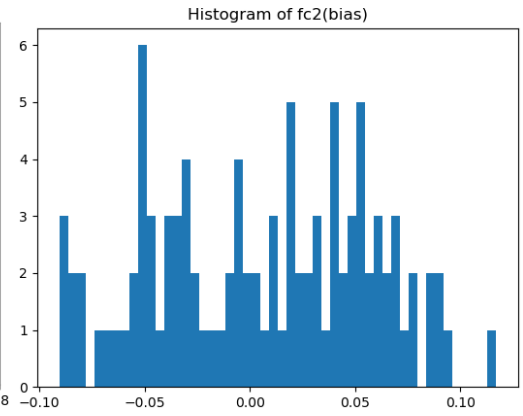

Histogram of conv2

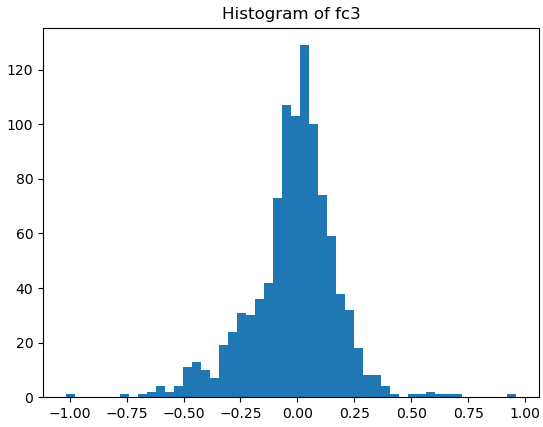

Histogram of conv2(bias)

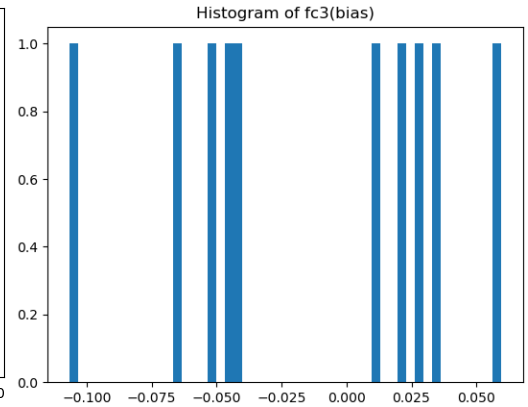

Histogram of fc1


Histogram of fc1(bias)

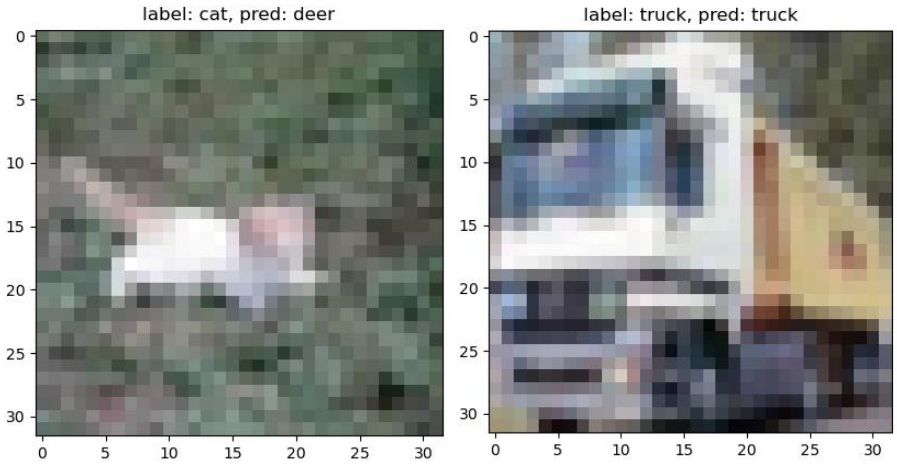








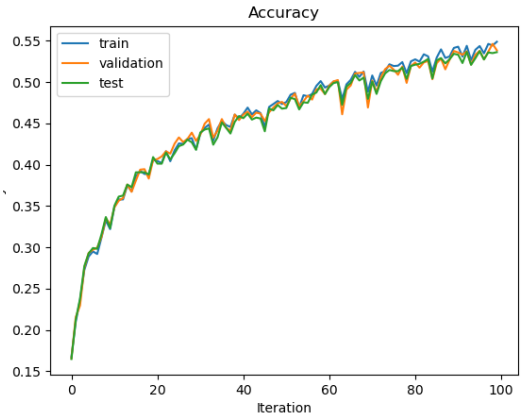
2-2



2-3

The results can’t be drawn since the color channel has been changed.

2-4


Accuracy
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validation
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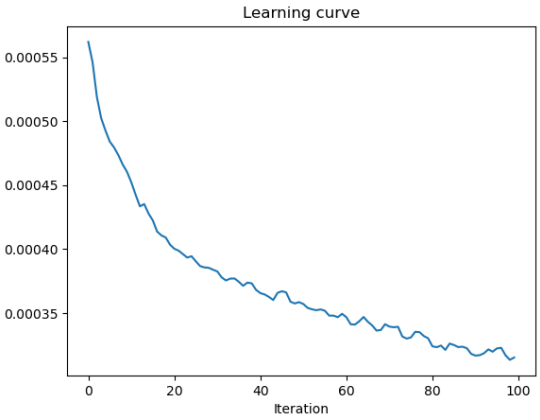
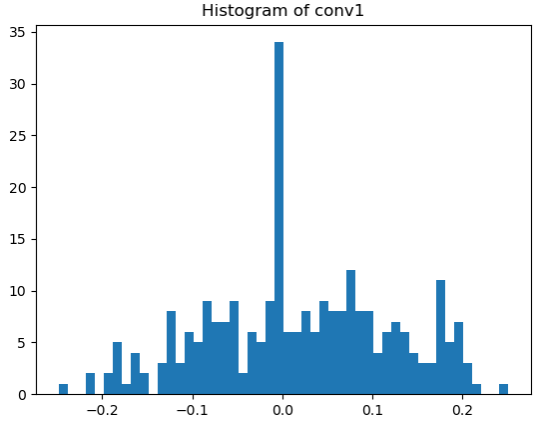
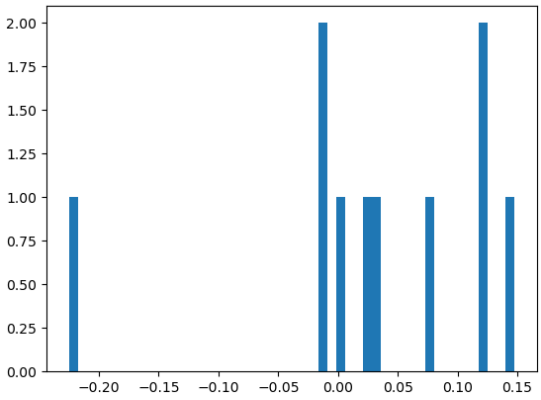
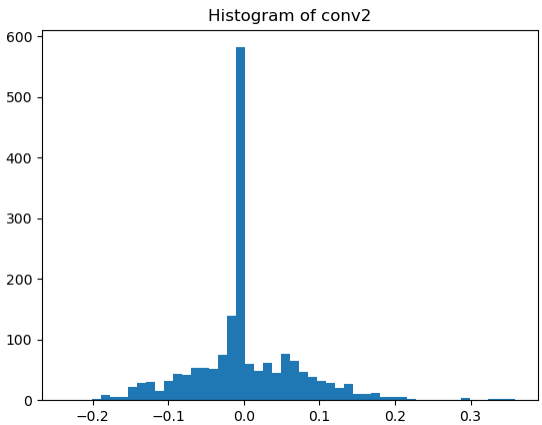
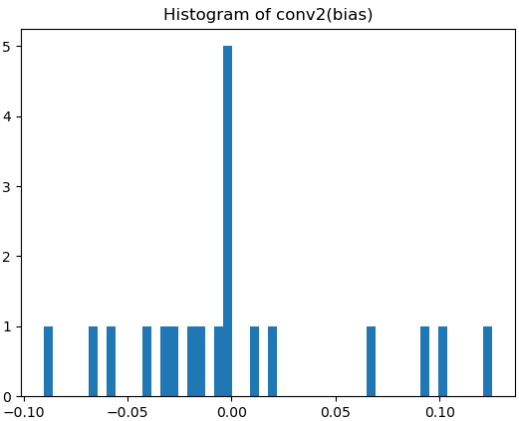
Iteration

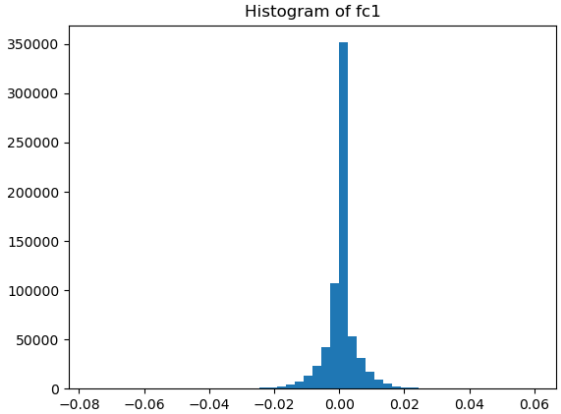

Learning curve
Iteration

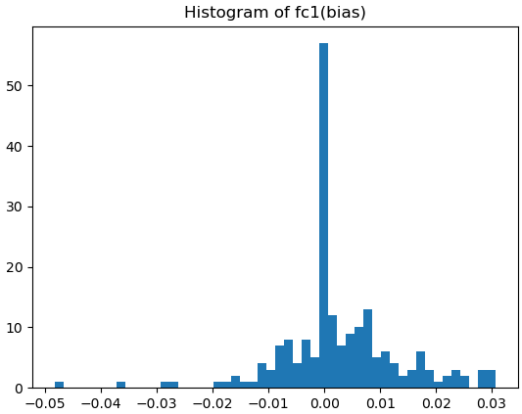

Histogram of conv1

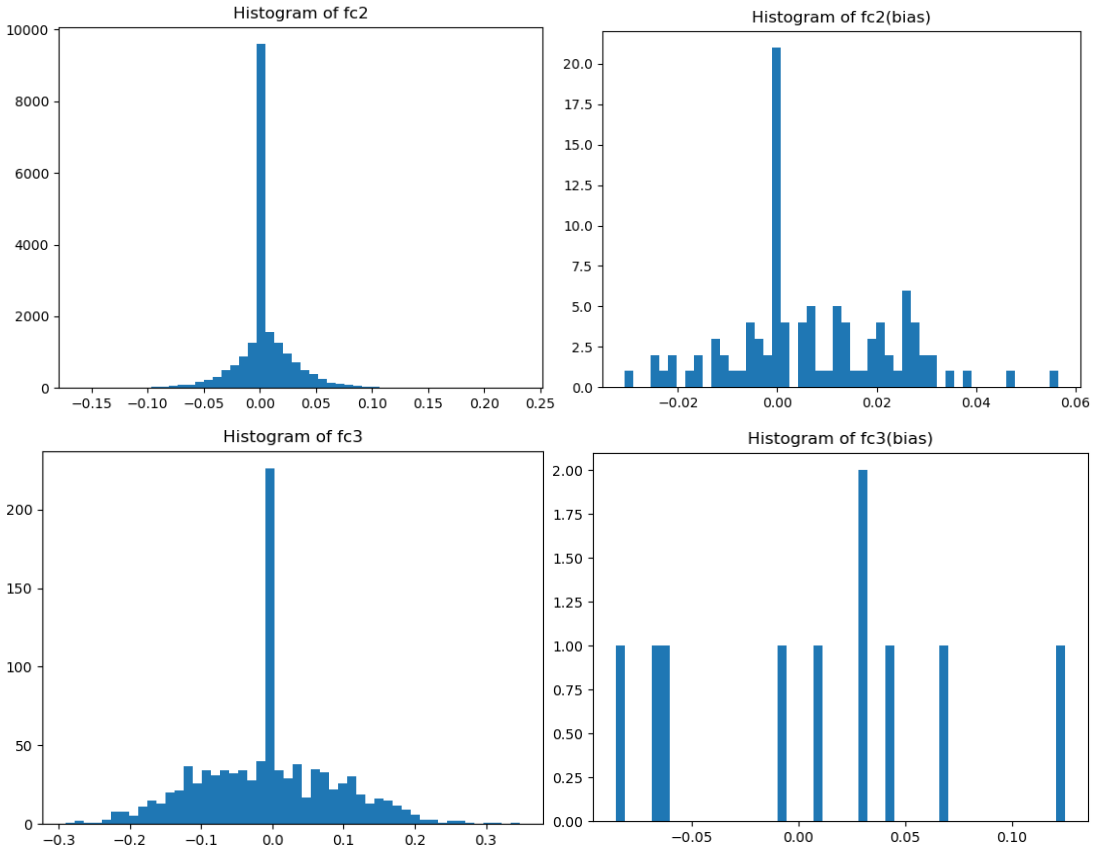

Histogram of conv1(bias)


Histogram of conv2


Histogram of conv2(bias)


Histogram of fc1


Histogram of fc1(bias)



2-5

I adjust the values of all pixels from 0-255 to 0-1, so the variation in inputs won't be to steep.