cs281B Hm2 Report
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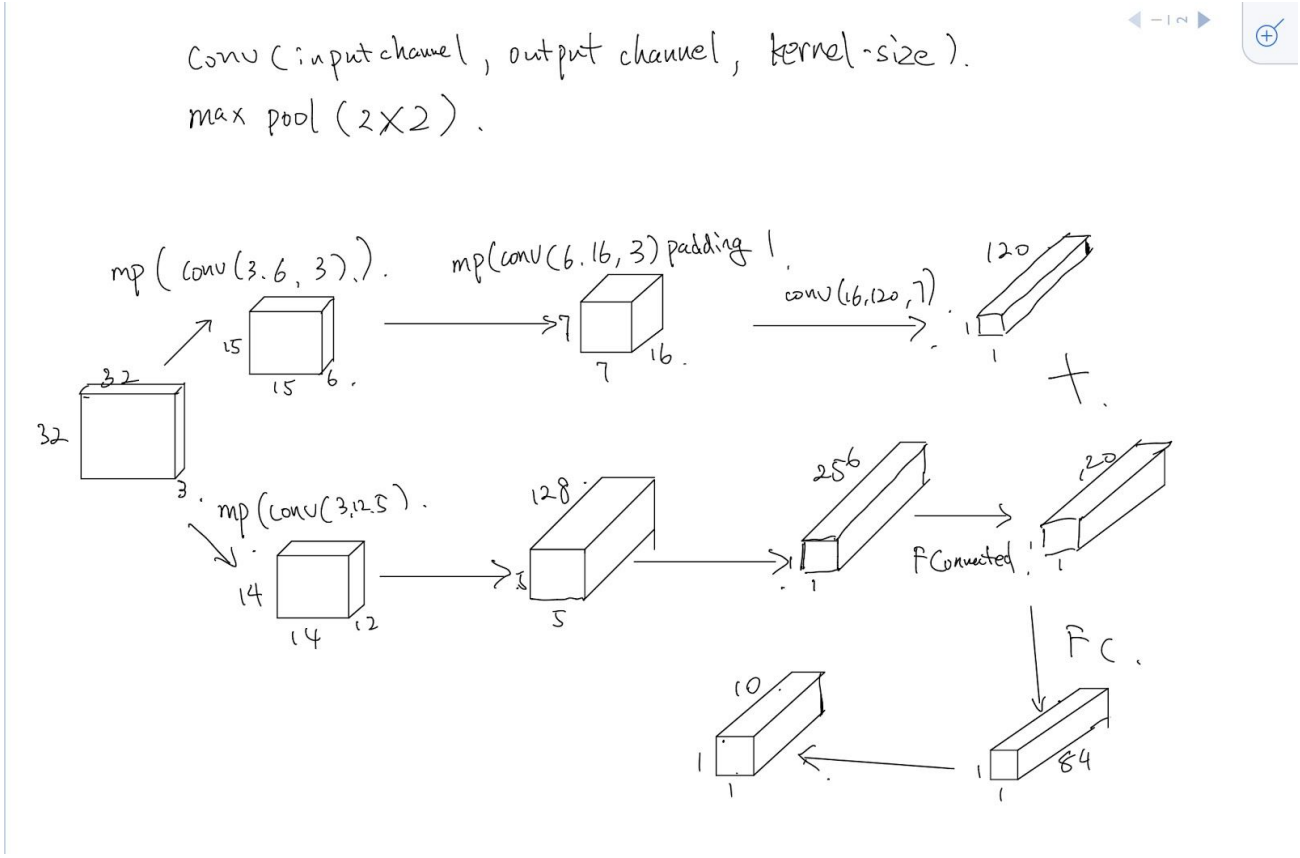
Dataset: Cifar 10
Toolkit: pytorch, python3.6
Machine: local desktop computer with 1080TI GPU enabled.

Preprocess: After loading training and testing images to data loader using torchvision, I performed random crop, random horizontal flip and normalization preprocessing steps. Then, I divide training dataset into training and validation dataset by a factor of 0.1.

Model: Since deep network would take a long time to train, so i decided to build a cnn model. I first tried a 2 layer CNN, but the accuracy was around 55%, so I concatenate two 3-layer CNN networks with different kernel sizes together to improve the accuracy. The detailed network structure are as follows.



Training: For every epoch, I test my model performance on my validation set. I save network model parameters whenever I get a better validation set accuracy and if the training process is stopped for some reason, I can load the saved parameters and resume the training.

During parameter tuning, I first try to train my network using fix learning rate of 0.001. The test data accuracy is about 60% after 15 epoch. Next, I use step learning rate scheduler to optimize parameters. I fixed the epoch number to 15. For every 5 epoch, I multiply my learning rate by a factor gamma of 0.1. After that my testing data accuracy is about 74%.

Validation| Acc: 75.120% (3756/5000)
Finished Training takes===> 334.64439845085144 seconds
Accuracy of the network on the 10000 test images: 74 %
Accuracy of plane : 80 %
Accuracy of car : 85 %
Accuracy of bird : 64 %
Accuracy of cat : 55 %
Accuracy of deer : 68 %
Accuracy of dog : 59 %
Accuracy of frog : 82 %
Accuracy of horse : 80 %
Accuracy of ship : 85 %
Accuracy of truck : 83 %