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Homework 3 - MNIST

My convolutional network network obtained slightly better than 98.0% accuracy.

Homework 4 - CIFAR-10/100

State of the art performance for the CIFAR-10 dataset seems to be 95+%, and about 75% for CIFAR-100. I implemented a residual network which scored about 74.4% on CIFAR-10 and 33.9% on CIFAR-100. This is not very close to current performance, but was not unexpected due to the network construction. To reduce training time on available hardware I used only 4 residual blocks, as opposed to the 16 in ResNet-50, and even more in larger networks. I also had to reduce the number of features, and train on the original 32x32 images rather than upsampled 224x224 that many networks seem to use. It's also possible that the values used were not optimal for a 4 residual block network.

Beyond increasing the size of the network, I would have liked to try more optimizers. I used the momentum optimizer with a momentum of 0.9, based on some successes I saw in other papers. I would have also liked to use a learning rate schedule to speed up early training while training better in later epochs, but I compromised and used a constant rate of 0.01. Finally, I would have liked to use augmented data.