Submission format

Submit a PDF-version report for all problems, including source codes and print screen results. You can use any text/code editor; Google Colab is recommended.

Review lecture slide 7 and 8 and finish the following problem.

Problem. Build LeNet for colorful image classification

LeNet is one of the earliest convolutional neural networks (CNNs), developed by Yann LeCun in the late 1980s and early 1990s. It was designed primarily for hand-written digit recognition, such as the MNIST dataset. You can refer to "LeNet-5" for more information about its CNN structure and implementation.

In this problem, you are asked to train and test a LeNet-5 for **entire** CIFAR-10 colorful image dataset. The CIFAR-10 dataset contains 60,000 32×32 color images in 10 different classes; please refer to its introduction for more information.

You need to implement a LeNet-5 to accommodate the CIFAR-10 dataset and fulfill the following requirements:

- Keep the basic network structure of LeNet-5 but you can change the hyperparameters.

- You need to submit three results: 1) network without dropout/batch normalization, 2) network with one additional dropout layer and 3) network with one additional batch normalization. The test accuracy should all achieve above 50%.

- Submission should include your source codes and screen snapshot of your train and test accuracy, plus the training time.

   Hints: you can use PyTorch torch.nn to find the packed Batch Normalization and Dropout layer if you would like to use. Also, you can load the CIFAR-10 dataset by torchvision.datasets.CIFAR10.