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Report Assignment 3

a) Make a 4-layer CNN, consisting of 4 convolutional layers and 1 fully connected layer at the end. Each convolutional layer (64 filters of 3×3 kernel size with stride 1 and zero-padding 1) is followed by batch normalization, ReLU activation, and max pooling (2×2 kernel size with stride 2).

- Please go to this [Link](#)

b) Train for 5 epochs with batch size 64.

- This is the result after training for 5 epochs with batch size = 64:

With epoch 0: loss: 2.494385 [64/48000] loss: 1.140690 [12864/48000] loss: 0.633241 [25664/48000] loss: 0.458913 [38464/48000] Train: Accuracy: 84.5%, Avg loss: 0.856968 Validation: Accuracy: 94.3%, Avg loss: 0.382469	With epoch 1: loss: 0.542006 [64/48000] loss: 0.268653 [12864/48000] loss: 0.231342 [25664/48000] loss: 0.316385 [38464/48000] Train: Accuracy: 95.3%, Avg loss: 0.294713 Validation: Accuracy: 96.3%, Avg loss: 0.223742
With epoch 2: loss: 0.144479 [64/48000] loss: 0.187811 [12864/48000] loss: 0.195464 [25664/48000] loss: 0.177441 [38464/48000] Train: Accuracy: 96.4%, Avg loss: 0.196589 Validation: Accuracy: 97.0%, Avg loss: 0.165474	With epoch 3: loss: 0.211446 [64/48000] loss: 0.208891 [12864/48000] loss: 0.152126 [25664/48000] loss: 0.119431 [38464/48000] Train: Accuracy: 97.1%, Avg loss: 0.153006 Validation: Accuracy: 97.4%, Avg loss: 0.133468
With epoch 4: loss: 0.088899 [64/48000] loss: 0.178606 [12864/48000] loss: 0.132298 [25664/48000] loss: 0.167488 [38464/48000] Train: Accuracy: 97.5%, Avg loss: 0.126720 Validation: Accuracy: 97.7%, Avg loss: 0.114666	Test: Accuracy: 97.9%, Avg loss: 0.105518

c) What is the final test accuracy?

- Test: Accuracy: 97.9%, Avg loss: 0.105518 with 5 epochs and batch size = 64