SUMMARY POINTS:

1) The final test accuracy on using LeNet on the CIFAR10 dataset without any augmentations is 0.6889976038338658 ~ 0.69.

2) The final test accuracy on using LeNet on the CIFAR10 dataset with transforms (data augmen tation) is 0.577276357827476 ~ 0.58.

3) The final test accuracy on using LeNet on the MNIST dataset without any augmentations is 0.9746405750798722 ~ 0.97.

4) The final test accuracy on using LeNet on the CIFAR10 dataset with transforms (data augmen tation) is 0.9568690095846646 ~ 0.96.

- Based on the above results, it can be seen that data augmentation was not useful for the CIFAR10 dataset and surprisingly augmenting dataset did slightly worse than no augmentation on the MNIST dataset.
- LeNet worked fantastic on MNIST which was expected since the LeNet architecture was tailored to work on digits (and it is also used in ATMs even now).
- CIFAR10 dataset, on the other hand, is more complicated than MNIST since the categories of images vary significantly. In MNIST, all images were of digits and were relatively simple.
- Results were surprising since augmentation enhances model's performance in most case but in this case neither dataset benefitted from it. This may most likely be due to the relatively simple LeNet model. Using a deep network like VGGNet, ResNet, or others would allow extraction of more features and hence better performance.