Project 4 Numpy Written Question Writeup

Instructions

- Refer to the PROJECT4_QUESTIONSTEMPLATE for information on Q6 of the Project 4 written questions. Please submit this file to Gradescope under the Project 4 Written Code (Numpy) assignment along with your completed `model.py`

- **Please make this document anonymous.**

A6

1. What do these numbers tell us about the capacity of the network, the complexity of the two problems, the value of training, and the value of the two different classification approaches?

   The overall accuracy that each model acheives show us that the "scenerec" is much harder than "mnist". The loss sum and how loss decreased from epochs to epochs also show the difficulty of learning during the training. The "scenerec" loss decreases much slower than "mnist" in percentage. Also, the nn+svm performs better than nn alone in both tasks.

2. How well did each model perform on each dataset? Please use this table to structure your response.

   In the following table, I used 1500 train images and 200 test images since it consumes a acceptable amount of time for each trial.

   - NN on MNIST: 90% (highest accuracy)
     - Epoch 0 loss: 13300 Accuracy: 68%
     - Epoch 9 loss: 256 Accuracy: 88%
   - NN+SVM on MNIST: 90% (highest accuracy)
     - Epoch 0 loss: 12701 Accuracy: 86%
     - Epoch 9 loss: 447 Accuracy: 90%
   - NN on SceneRec: 44% (highest accuracy)
     - Epoch 0 loss: 448570 Accuracy: 2%
     - Epoch 9 loss: 302062 Accuracy: 4%
   - NN+SVM on SceneRec: 17% (highest accuracy)
     - Epoch 0 loss: 433819 Accuracy: 14%
     - Epoch 9 loss: 286412 Accuracy: 16% s