Introduction to Deep Learning

Homework 1

This homework assignment is due by midnight of 3/23. Please upload your homework to LMS. 50% penalty will be applied if it is submitted on 3/24. No submission will be accepted after 3/24.

1. Implement Logistic Regression with Mini-batch Gradient Descent using TensorFlow. Train it and evaluate it on the moons dataset (introduced in Chapter 5). Try adding all the bells and whistles:
   1. Define the graph within a logistic\_regression() function that can be reused easily. (submit python file)
   2. Save checkpoints using a Saver at regular intervals during training, and save the final model at the end of training. (submit both python file and the saved model)
   3. Restore the last checkpoint upon startup if training was interrupted. (submit python file)
   4. Define the graph using nice scopes so the graph looks good in TensorBoard. (submit python file)
   5. Add summaries to visualize the learning curves in TensorBoard. (submit python file)
   6. Try tweaking hyperparameters, including the learning rate and the mini- batch size and display the shape of the learning curve. (submit screenshot)
2. Train a deep MLP on the MNIST dataset and see if you can get over 98% precision. Just like in the first problem, try adding all the bells and whistles (i.e., save checkpoints, restore the last checkpoint in case of an interruption, add summaries, plot learning curves using TensorBoard, and so on).