Experiments with old-style neural network using TensorFlow

Background

You are asked to experiment with parameters that are used to train an old style neural network. The example program **mnist01.py** is made available online. This program is a modification of an example available at:

> https://www.tensorflow.org/get_started/mnist/pros.

For this assignment you are only allowed to change some parameters in **mnist01.py**.

Parameters that can be changed

1. **Line 24:** The weights are initialized with 0 mean and standard deviation of 0.1. You can change the value of the standard deviation.

2. **Line 30:** The bias is set to 0.1. You can change this value.

3. **Line 33-44:** You can change the number of layers and the number of nodes in each layer. The restrictions are that the layers must be fully connected and use sigmoids.

4. **Line 51:** You can change the learning rate (currently 0.5).

5. **Line 53-54:** The current program runs 1500 weight update steps, each one with a batch of 100 examples. You can change both of these numbers. Recall that a "batch" of 1 gives the stochastic steepest descent.

Evaluation

The challenge is to get as high accuracy as possible, with the limitation that your program terminates in **less than 10 minutes**. If you are concerned that your computer is slower than average, you may bring another computer to the evaluation, or ask the TA's to run your program on one of the lab computers. Observe that because of the random initialization different runs of the program may produce (slightly) different accuracy values. The one that counts for your grade is the one produced by your program when you meet with the TAs.

What you need to submit

1. Source code of the python script.

2. Documentation describing your experiments and the test accuracy that your program achieves.

You **must** be available to demonstrate your program to the TAs. Time slots and additional instructions will be announced later.

Deadline:

TBA.