Deep Learning: Homework #2

In this homework, we will use Google's Tensorflow (TF) to create deep neural networks (CNNs), in order to classify handwritten digits from the MNIST dataset.

Task #1 (Code Completion)

In this task, you need to understand the provided python source code (cnn_mnist.py). In particular, there are some missing parts of the code marked with "?", for example:

```
'wc2': tf.Variable(tf.random_normal([?, ?, ?, 64])),
```

Fill-in these missing parts of the code, so that it will perform 10-classes multi-class classification on the MNIST digits.

Task #2 (Add another convolution & pooling layers)

The source code (cnn_mnist.py) creates one convolution layer and one pooling layer. Modify the code, so that the resulting network will have the following structure:

Conv (5x5, 32 filters, stride=1)
=> Pooling (2x2, stride=2)
=> Conv (5x5, 64 filters, stride=1)
=> Pooling (2x2, stride=2)
=> Fully connected (hidden units = 1024)
=> Fully connected (output=10)

Submit a report, containing the following:

1. Task #1: completed python code, printed out (font size 9)
    a. test accuracy value
2. Task #2: completed python code, printed out (font size 9)
    a. test accuracy value

Checklist:

1. Don't forget to write down your name and student ID
2. The report MUST be written in English. Reports with other languages will NOT be accepted.
3. Hand-writing of the report is not permitted.
4. Discussion with other students are strongly encouraged, but you should make your own answers to the questions.