Assignment 1 Part 1

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Architecture

Using the tf.layers API built into Tensorflow, I created the following architecture:

- input_layer = tf.reshape(features["x"], [-1, 28, 28, 1])
- conv1 = tf.layers.conv2d(inputs=input_layer, filters=4, kernel_size=[5, 5], padding="same", activation=tf.nn.relu)
- pool1 = tf.layers.max_pooling2d(inputs=conv1, pool_size=[2, 2], strides=2)
- conv2 = tf.layers.conv2d(inputs=pool1, filters=8, kernel_size=[5, 5], padding="same", activation=tf.nn.relu)
- pool2 = tf.layers.max_pooling2d(inputs=conv2, pool_size=[2, 2], strides=2)
- pool2_flat = tf.reshape(pool2, [-1, 7 * 7 * 8])
- logits = tf.layers.dense(inputs=pool2_flat, units=10)

Trainable Parameters

The number of trainable parameters for my model was:

Kernel = 5 * 5 = 25

Reshaped images = 7 * 7 * 8 channels = 392

Conv1 : **Kernel** * 4 filters * 1 channel = 100 + 4 bias nodes = 104

Conv2 : **Kernel** * 8 filters * 4 channels = 800 + 8 bias nodes = 808

Logits (fully connected) : **Reshaped images** * 10 output nodes = 3920 + 10 bias nodes = 3930

Total trainable parameters = Conv1 + Conv2 + Logits = 104 + 808 + 3930 = 4842