

## Batch\_Norm for CIFAR-10 Datasets in TensorFlow

### [ Problem ]:

1. Please build a Convnet in TensorFlow for a multiple-output classifier with **CIFAR-10** dataset, which includes "Convolution Layers" & "MaxPooling Layers", as following:
  - **Conv Layer 1\_1**
  - **Conv Layer 1\_2**
  - **Conv Layer 1\_3**
  - **MaxPool Layer 1**
  - **Conv Layer 2\_1**
  - **Conv Layer 2\_2**
  - **Conv Layer 2\_3**
  - **MaxPool Layer 2**
  - **Conv Layer 3\_1**
  - **Conv Layer 3\_2**
  - **Conv Layer 3\_3**
  - **MaxPool Layer 3**
  - **Hidden Layer 1**
  - **Hidden Layer 2**
  - **Output Layer**
2. Using Batch Normalization by applying `tf.contrib.layers.batch_norm()` to both Convolution Layers (`tf.contrib.layers.conv2d()`) as well as Hidden Layers.
3. And then, compare the results with those in the reference below:
  - Tom Hope, Yehezkel S. Resheff, and Itay Lieder, "**Learning TensorFlow : A Guide to Building Deep Learning Systems**", Chapter 4, O'Reilly, 2017.  
[ Code ] : [https://github.com/giser-yugang/Learning\\_TensorFlow](https://github.com/giser-yugang/Learning_TensorFlow).

### [ REFERENCE ] :

- dhwajraj, "How I can apply batch normalization?", 2016/12/07. <https://github.com/dennybritz/cnn-text-classification-tf/issues/29>
- `tf.contrib.layers.conv2d`: [https://www.tensorflow.org/api\\_docs/python/tf/contrib/layers/conv2d](https://www.tensorflow.org/api_docs/python/tf/contrib/layers/conv2d)