*'''*

*A logistic regression learning algorithm example using TensorFlow library.*

*This example is using the MNIST database of handwritten digits*

*'''***from** \_\_future\_\_ **import** print\_function

**import** tensorflow **as** tf

*# Import MNIST data*

**from** tensorflow.examples.tutorials.mnist **import** input\_data  
mnist = input\_data.read\_data\_sets(**"/tmp/data/"**, one\_hot=**True**)

*# Parameters*learning\_rate = 0.01  
training\_epochs = 25  
batch\_size = 100  
display\_step = 1

*# tf Graph Input*x = tf.placeholder(tf.float32, [**None**, 784]) *# mnist data image of shape 28\*28=784*y = tf.placeholder(tf.float32, [**None**, 10]) *# 0-9 digits recognition => 10 classes*

*# Set model weights*W = tf.Variable(tf.zeros([784, 10]))  
b = tf.Variable(tf.zeros([10]))

*# Construct model*pred = tf.nn.softmax(tf.matmul(x, W) + b) *# Softmax*

*# Minimize error using cross entropy*cost = tf.reduce\_mean(-tf.reduce\_sum(y\*tf.log(pred), reduction\_indices=1))

*# Gradient Descent*optimizer = tf.train.GradientDescentOptimizer(learning\_rate).minimize(cost)

*# Initialize the variables (i.e. assign their default value)*init = tf.global\_variables\_initializer()

*# Start training***with** tf.Session() **as** sess:

*# Run the initializer* sess.run(init)  
 writer = tf.summary.FileWriter(**'./graphs/logistic\_reg'**, sess.graph)

*# Training cycle* **for** epoch **in** range(training\_epochs):  
 avg\_cost = 0.  
 total\_batch = int(mnist.train.num\_examples/batch\_size)

*# Loop over all batches* **for** i **in** range(total\_batch):  
 batch\_xs, batch\_ys = mnist.train.next\_batch(batch\_size)

*# Run optimization op (backprop) and cost op (to get loss value)* \_, c = sess.run([optimizer, cost], feed\_dict={x: batch\_xs, y: batch\_ys})

*# Compute average loss* avg\_cost += c / total\_batch

*# Display logs per epoch step* **if** (epoch+1) % display\_step == 0:

print(**"Epoch:"**, **'%04d'** % (epoch+1), **"cost="**, **"{:.9f}"**.format(avg\_cost))

print(**"Optimization Finished!"**)

