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In [2]: import os
import matplotlib
import numpy as np
import pandas as pd
from scipy import ndimage
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
import tensorflow as tf
import zipfile
import requests, StringIO
from sklearn import preprocessing

BATCH_SIZE = 20
NUM_CLASSES = 200
NUM_IMAGES_PER_CLASS = 500
NUM_IMAGES = NUM_CLASSES * NUM_IMAGES_PER_CLASS
TRAINING_IMAGES_DIR = '/datasets/tmp/cgl81fdn/tiny-imagenet-200/train/'
TRAIN_SIZE = NUM_IMAGES

NUM_VAL_IMAGES = 10000
VAL_IMAGES_DIR = '/datasets/tmp/cgl81fdn/tiny-imagenet-200/val/'

IMAGE_SIZE = 64
NUM_CHANNELS = 3
IMAGE_ARR_SIZE = IMAGE_SIZE * IMAGE_SIZE * NUM_CHANNELS
IMAGES_URL = 'http://cs231n.stanford.edu/tiny-imagenet-200.zip'

def download_images(url):
    if (os.path.isdir(TRAINING_IMAGES_DIR)):
        print ('Images already downloaded...')
        return
    r = requests.get(url, stream=True)
    print ('Downloading ' + url )
    zip_ref = zipfile.ZipFile(StringIO.StringIO(r.content))
    zip_ref.extractall('/datasets/tmp/cgl81fdn/')
    zip_ref.close()

def load_training_images(image_dir, batch_size=500):

    image_index = 0

    images = np.ndarray(shape=(NUM_IMAGES, IMAGE_ARR_SIZE))
    names = []
    labels = []

    # Loop through all the types directories
    for type in os.listdir(image_dir):
        if os.path.isdir(image_dir + type + '/images/'):
            type_images = os.listdir(image_dir + type + '/images/')
            # Loop through all the images of a type directory
            batch_index = 0;
            #print ("Loading Class ", type)
            for image in type_images:
                image_file = os.path.join(image_dir, type + '/images/', image)

                # reading the images as they are; no normalization, no color editing
                image_data = mpimg.imread(image_file)
                #print ('Loaded Image', image_file, image_data.shape)
                if (image_data.shape == (IMAGE_SIZE, IMAGE_SIZE, NUM_CHANNELS)):
                    images[image_index, :] = image_data.flatten()

                    labels.append(type)
                    names.append(image)

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        image_index += 1
        batch_index += 1
    if (batch_index >= batch_size):
        break;

    return (images, np.asarray(labels), np.asarray(names))

def get_label_from_name(data, name):
    for idx, row in data.iterrows():
        if (row['File'] == name):
            return row['Class']

    return None

def load_validation_images(testdir, validation_data, batch_size=NUM_VAL_IMAGES):
    labels = []
    names = []
    image_index = 0

    images = np.ndarray(shape=(batch_size, IMAGE_ARR_SIZE))
    val_images = os.listdir(testdir + '/images/')

    # Loop through all the images of a val directory
    batch_index = 0;

    for image in val_images:
        image_file = os.path.join(testdir, 'images/', image)
        #print (testdir, image_file)

        # reading the images as they are; no normalization, no color editing
        image_data = mpimg.imread(image_file)
        if (image_data.shape == (IMAGE_SIZE, IMAGE_SIZE, NUM_CHANNELS)):
            images[image_index, :] = image_data.flatten()
            image_index += 1
            labels.append(get_label_from_name(validation_data, image))
            names.append(image)
            batch_index += 1

        if (batch_index >= batch_size):
            break;

    print ("Loaded Validation images ", image_index)
    return (images, np.asarray(labels), np.asarray(names))

def plot_object(data):
    plt.figure(figsize=(1,1))
    image = data.reshape(IMAGE_SIZE, IMAGE_SIZE, NUM_CHANNELS)
    plt.imshow(image, cmap = matplotlib.cm.binary,
               interpolation="nearest")
    plt.axis("off")
    plt.show()

def plot_objects(instances, images_per_row=10, **options):
    size = IMAGE_SIZE
    images_per_row = min(len(instances), images_per_row)
    images = [instance.reshape(size,size,NUM_CHANNELS) for instance in instances]
    n_rows = (len(instances) - 1) // images_per_row + 1
    row_images = []
    n_empty = n_rows * images_per_row - len(instances)
    images.append(np.zeros((size, size * n_empty)))
    for row in range(n_rows):
        if (row == len(instances)/images_per_row):
            break

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        rimages = images[row * images_per_row : (row + 1) * images_per_row]
        row_images.append(np.concatenate(rimages, axis=1))
    image = np.concatenate(row_images, axis=0)
    plt.imshow(image, **options)
    plt.axis("off")
    plt.show()

def get_next_batch(batchsize=50):
    for cursor in range(0, len(training_images), batchsize):
        batch = []
        batch.append(training_images[cursor:cursor+batchsize])
        batch.append(training_labels[cursor:cursor+batchsize])
        yield batch

def get_val_batch(batchsize=50):
    for cursor in range(0, len(val_images), batchsize):
        batch = []
        batch.append(val_images[cursor:cursor+batchsize])
        batch.append(val_labels[cursor:cursor+batchsize])
        yield batch

def get_next_labels(batchsize=50):
    for cursor in range(0, len(training_images), batchsize):
        yield training_labels[cursor:cursor+batchsize]

def reset_graph(seed=42):
    tf.reset_default_graph()
    tf.set_random_seed(seed)
    np.random.seed(seed)
```

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In [3]: import gzip
import cPickle

def load_zipped_pickle(filename):
    with gzip.open(filename, 'rb') as f:
        loaded_object = cPickle.load(f)
    return loaded_object

download_images(IMAGES_URL)
# training_images, training_labels, training_files = load_training_images(TRAINING_IMAGE
S_DIR, batch_size=500)

# shuffle_index = np.random.permutation(len(training_labels))
# training_images = training_images[shuffle_index]
# training_labels = training_labels[shuffle_index]
# training_files = training_files[shuffle_index]

# le = preprocessing.LabelEncoder()
# training_le = le.fit(training_labels)
# training_labels_encoded = training_le.transform(training_labels)

# print ("First 30 Training Labels", training_labels_encoded[0:30])
# plot_objects(training_images[0:30])

# val_data = pd.read_csv(VAL_IMAGES_DIR + 'val_annotations.txt', sep='\t', header=None,
names=['File', 'Class', 'X', 'Y', 'H', 'W'])
# val_images, val_labels, val_files = load_validation_images(VAL_IMAGES_DIR, val_data, b
atch_size=50)
# #val_images, val_labels, val_files = load_validation_images(VAL_IMAGES_DIR, val_data)
# val_labels_encoded = training_le.transform(val_labels)
# plot_objects(val_images[0:30])
# print (val_labels_encoded[0:30])

# data = load_zipped_pickle("tinyImageData")

# shuffle_train_index = np.random.permutation(len(data['train']['data']))
# training_images = np.array(data['train']['data'])[shuffle_train_index]
# training_labels = np.array(data['train']['target'])[shuffle_train_index]

# shuffle_val_index = np.random.permutation(len(data['val']['data']))
# val_images = np.array(data['val']['data'])[shuffle_val_index]
# val_labels = np.array(data['val']['target'])[shuffle_val_index]

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Downloading <http://cs231n.stanford.edu/tiny-imagenet-200.zip>

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In [9]: height = IMAGE_SIZE
width = IMAGE_SIZE
channels = NUM_CHANNELS
n_inputs = height * width * channels
n_outputs = 200

reset_graph()

X = tf.placeholder(tf.float32, shape=[None, n_inputs], name="X")
X_reshaped = tf.reshape(X, shape=[-1, height, width, channels])
y = tf.placeholder(tf.int32, shape=[None], name="y")

#input shape [-1, 64, 64, 3]
conv1 = tf.layers.conv2d(
    inputs=X_reshaped,
    filters=64,
    kernel_size=[11,11],
    padding='SAME',
    activation=tf.nn.relu,
    name="conv1")
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bn1 = tf.layers.batch_normalization(  
    inputs=conv1,  
    name="bn1")  
  
pool1 = tf.layers.max_pooling2d(  
    inputs=bn1,  
    pool_size=[2, 2],  
    strides=2,  
    name="pool1")  
  
conv2 = tf.layers.conv2d(  
    inputs=pool1,  
    filters=128,  
    kernel_size=[7,7],  
    padding='SAME',  
    activation=tf.nn.relu,  
    name="conv2")  
  
bn2 = tf.layers.batch_normalization(  
    inputs=conv2,  
    name="bn2")  
  
pool2 = tf.layers.max_pooling2d(  
    inputs=bn2,  
    pool_size=[2, 2],  
    strides=2,  
    name="pool2")  
  
conv3 = tf.layers.conv2d(  
    inputs=pool2,  
    filters=192,  
    kernel_size=[3,3],  
    padding='SAME',  
    activation=tf.nn.relu,  
    name="conv3")  
  
bn3 = tf.layers.batch_normalization(  
    inputs=conv3,  
    name="bn3")  
  
pool3 = tf.layers.max_pooling2d(  
    inputs=bn3,  
    pool_size=[2, 2],  
    strides=2,  
    name="pool3")  
  
conv4 = tf.layers.conv2d(  
    inputs=pool3,  
    filters=256,  
    kernel_size=[3,3],  
    padding='SAME',  
    activation=tf.nn.relu,  
    name="conv4")  
  
bn4 = tf.layers.batch_normalization(  
    inputs=conv4,  
    name="bn4")  
  
pool4 = tf.layers.max_pooling2d(  
    inputs=bn4,  
    pool_size=[2, 2],  
    strides=2,  
    name="pool4")  
  
#pool2_flat = tf.reshape(pool1, [-1, 8 * 8 * 64])  
# Dense Layer  
pool4_flat = tf.contrib.layers.flatten(pool4)
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dense1 = tf.layers.dense(inputs=pool4_flat, units=4096, activation=tf.nn.relu)
bn5 = tf.layers.batch_normalization(
    inputs=dense1,
    name="bn5")

dense2 = tf.layers.dense(inputs=bn5, units=512, activation=tf.nn.relu)
bn6 = tf.layers.batch_normalization(
    inputs=dense2,
    name="bn6")

# Logits Layer
logits = tf.layers.dense(inputs=bn6, units=200, name='output')
Y_proba = tf.nn.softmax(logits, name="Y_proba")

xentropy = tf.nn.sparse_softmax_cross_entropy_with_logits(logits=logits, labels=y)
loss = tf.reduce_mean(xentropy)
optimizer = tf.train.GradientDescentOptimizer(learning_rate=0.0001)
#optimizer = tf.keras.optimizers.SGD(lr=0.001, momentum=0.9, decay=0.000001, nesterov=True)
training_op = optimizer.minimize(loss)

correct = tf.nn.in_top_k(logits, y, 1)
accuracy = tf.reduce_mean(tf.cast(correct, tf.float32))
init = tf.global_variables_initializer()
saver = tf.train.Saver()
```



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In [ ]: n_epochs = 10
        batch_size = 10

        with tf.Session() as sess:
            init.run()
            trainAccuracy = []
            trainLoss = []
            valAccuracy = []
            for epoch in range(n_epochs):
                # get the accuracy and loss, with the count
                sumAccuracy = 0
                sumLoss = 0
                count = 0

                for batch in get_next_batch(1000):
                    X_batch, y_batch = batch[0], batch[1]
                    #print ('Training set', X_batch.shape, y_batch.shape)
                    _, myLoss = sess.run([training_op, loss], feed_dict={X: X_batch, y: y_batch})

                sumAccuracy += accuracy.eval(feed_dict={X: X_batch, y: y_batch})
                sumLoss += myLoss
                count += 1
                if (count * 1000 % 1000 == 0):
                    print("Total Batch finished: %d, Accuracy: %f, Loss: %f" % (count * 1000
, sumAccuracy/count, sumLoss/count))

                    save_path = saver.save(sess, "./tiny_imagenet/vgg_like")

                trainAccuracy.append(sumAccuracy / count)
                trainLoss.append(sumLoss / count)
                print(epoch, "Train Accuracy:", trainAccuracy[-1], "Train Loss:", trainLoss[-1])

                print("Batching Validation...")
                for batch in get_val_batch(1000):
                    X_batch, y_batch = batch[0], batch[1]
                    valAccuracy.append(accuracy.eval(feed_dict={X: X_batch, y: y_batch}))
                print("Test Accuracy:", sum(valAccuracy)/len(valAccuracy))

            print("Final Train Accuracy: %f" % (trainAccuracy[-1]))

```

Total Batch finished: 1000, Accuracy: 0.005000, Loss: 22.481092  
Total Batch finished: 2000, Accuracy: 0.003500, Loss: 20.707058  
Total Batch finished: 3000, Accuracy: 0.004000, Loss: 18.543517  
Total Batch finished: 4000, Accuracy: 0.004750, Loss: 16.815016  
Total Batch finished: 5000, Accuracy: 0.005400, Loss: 15.306990  
Total Batch finished: 6000, Accuracy: 0.004667, Loss: 14.179837  
Total Batch finished: 7000, Accuracy: 0.004571, Loss: 13.310828  
Total Batch finished: 8000, Accuracy: 0.005250, Loss: 12.632472  
Total Batch finished: 9000, Accuracy: 0.005556, Loss: 12.074749  
Total Batch finished: 10000, Accuracy: 0.005900, Loss: 11.595311  
Total Batch finished: 11000, Accuracy: 0.006273, Loss: 11.203014  
Total Batch finished: 12000, Accuracy: 0.006250, Loss: 10.852432  
Total Batch finished: 13000, Accuracy: 0.006000, Loss: 10.557579  
Total Batch finished: 14000, Accuracy: 0.005929, Loss: 10.293337  
Total Batch finished: 15000, Accuracy: 0.005867, Loss: 10.062110  
Total Batch finished: 16000, Accuracy: 0.005875, Loss: 9.846153  
Total Batch finished: 17000, Accuracy: 0.006118, Loss: 9.646032  
Total Batch finished: 18000, Accuracy: 0.006000, Loss: 9.475522  
Total Batch finished: 19000, Accuracy: 0.006000, Loss: 9.309819  
Total Batch finished: 20000, Accuracy: 0.005850, Loss: 9.158735  
Total Batch finished: 21000, Accuracy: 0.005905, Loss: 9.027520  
Total Batch finished: 22000, Accuracy: 0.005955, Loss: 8.901146  
Total Batch finished: 23000, Accuracy: 0.005913, Loss: 8.780914  
Total Batch finished: 24000, Accuracy: 0.005792, Loss: 8.673239  
Total Batch finished: 25000, Accuracy: 0.005800, Loss: 8.572958  
Total Batch finished: 26000, Accuracy: 0.005731, Loss: 8.476819  
Total Batch finished: 27000, Accuracy: 0.005667, Loss: 8.388698  
Total Batch finished: 28000, Accuracy: 0.005643, Loss: 8.306512  
Total Batch finished: 29000, Accuracy: 0.005586, Loss: 8.230187  
Total Batch finished: 30000, Accuracy: 0.005533, Loss: 8.156299  
Total Batch finished: 31000, Accuracy: 0.005548, Loss: 8.085939  
Total Batch finished: 32000, Accuracy: 0.005500, Loss: 8.018209  
Total Batch finished: 33000, Accuracy: 0.005545, Loss: 7.955000  
Total Batch finished: 34000, Accuracy: 0.005441, Loss: 7.896082  
Total Batch finished: 35000, Accuracy: 0.005514, Loss: 7.837329  
Total Batch finished: 36000, Accuracy: 0.005472, Loss: 7.783147  
Total Batch finished: 37000, Accuracy: 0.005514, Loss: 7.731010  
Total Batch finished: 38000, Accuracy: 0.005526, Loss: 7.681037  
Total Batch finished: 39000, Accuracy: 0.005462, Loss: 7.634207  
Total Batch finished: 40000, Accuracy: 0.005425, Loss: 7.590708  
Total Batch finished: 41000, Accuracy: 0.005390, Loss: 7.549065  
Total Batch finished: 42000, Accuracy: 0.005452, Loss: 7.507525  
Total Batch finished: 43000, Accuracy: 0.005465, Loss: 7.467775  
Total Batch finished: 44000, Accuracy: 0.005432, Loss: 7.431238  
Total Batch finished: 45000, Accuracy: 0.005400, Loss: 7.394967  
Total Batch finished: 46000, Accuracy: 0.005457, Loss: 7.359279  
Total Batch finished: 47000, Accuracy: 0.005532, Loss: 7.323089  
Total Batch finished: 48000, Accuracy: 0.005479, Loss: 7.290953  
Total Batch finished: 49000, Accuracy: 0.005571, Loss: 7.259121  
Total Batch finished: 50000, Accuracy: 0.005480, Loss: 7.228568  
Total Batch finished: 51000, Accuracy: 0.005510, Loss: 7.198820  
Total Batch finished: 52000, Accuracy: 0.005462, Loss: 7.170467  
Total Batch finished: 53000, Accuracy: 0.005528, Loss: 7.142642  
Total Batch finished: 54000, Accuracy: 0.005537, Loss: 7.115049  
Total Batch finished: 55000, Accuracy: 0.005509, Loss: 7.088733  
Total Batch finished: 56000, Accuracy: 0.005536, Loss: 7.063407  
Total Batch finished: 57000, Accuracy: 0.005491, Loss: 7.038866  
Total Batch finished: 58000, Accuracy: 0.005500, Loss: 7.015970  
Total Batch finished: 59000, Accuracy: 0.005475, Loss: 6.992377  
Total Batch finished: 60000, Accuracy: 0.005467, Loss: 6.970252  
Total Batch finished: 61000, Accuracy: 0.005541, Loss: 6.948554  
Total Batch finished: 62000, Accuracy: 0.005581, Loss: 6.927348  
Total Batch finished: 63000, Accuracy: 0.005603, Loss: 6.907696  
Total Batch finished: 64000, Accuracy: 0.005594, Loss: 6.888193  
Total Batch finished: 65000, Accuracy: 0.005600, Loss: 6.868575  
Total Batch finished: 66000, Accuracy: 0.005606, Loss: 6.848741  
Total Batch finished: 67000, Accuracy: 0.005642, Loss: 6.830331

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Total Batch finished: 68000, Accuracy: 0.005632, Loss: 6.812761
Total Batch finished: 69000, Accuracy: 0.005696, Loss: 6.794712
Total Batch finished: 70000, Accuracy: 0.005657, Loss: 6.777824
Total Batch finished: 71000, Accuracy: 0.005620, Loss: 6.761264
Total Batch finished: 72000, Accuracy: 0.005611, Loss: 6.745453
Total Batch finished: 73000, Accuracy: 0.005658, Loss: 6.729362
Total Batch finished: 74000, Accuracy: 0.005649, Loss: 6.713655
Total Batch finished: 75000, Accuracy: 0.005640, Loss: 6.699107
Total Batch finished: 76000, Accuracy: 0.005671, Loss: 6.684796
Total Batch finished: 77000, Accuracy: 0.005662, Loss: 6.670151
Total Batch finished: 78000, Accuracy: 0.005679, Loss: 6.655999
Total Batch finished: 79000, Accuracy: 0.005684, Loss: 6.642192
Total Batch finished: 80000, Accuracy: 0.005675, Loss: 6.628738
Total Batch finished: 81000, Accuracy: 0.005667, Loss: 6.615854
Total Batch finished: 82000, Accuracy: 0.005732, Loss: 6.602694
Total Batch finished: 83000, Accuracy: 0.005807, Loss: 6.590241
Total Batch finished: 84000, Accuracy: 0.005821, Loss: 6.578529
Total Batch finished: 85000, Accuracy: 0.005894, Loss: 6.566489
Total Batch finished: 86000, Accuracy: 0.005895, Loss: 6.554889
Total Batch finished: 87000, Accuracy: 0.005885, Loss: 6.542937
Total Batch finished: 88000, Accuracy: 0.005932, Loss: 6.530840
Total Batch finished: 89000, Accuracy: 0.005899, Loss: 6.520085
Total Batch finished: 90000, Accuracy: 0.005911, Loss: 6.508823
Total Batch finished: 91000, Accuracy: 0.005934, Loss: 6.497966
Total Batch finished: 92000, Accuracy: 0.005935, Loss: 6.487357
Total Batch finished: 93000, Accuracy: 0.005914, Loss: 6.476631
Total Batch finished: 94000, Accuracy: 0.005936, Loss: 6.466660
Total Batch finished: 95000, Accuracy: 0.005916, Loss: 6.456585
Total Batch finished: 96000, Accuracy: 0.005865, Loss: 6.446855
Total Batch finished: 97000, Accuracy: 0.005845, Loss: 6.437176
Total Batch finished: 98000, Accuracy: 0.005827, Loss: 6.427772
Total Batch finished: 99000, Accuracy: 0.005838, Loss: 6.418340
Total Batch finished: 100000, Accuracy: 0.005830, Loss: 6.409005
(0, 'Train Accuracy:', 0.0058300000627059491, 'Train Loss:', 6.4090047311782836)
Batching Validation...
('Test Accuracy:', 0.0055000001098960642)
Total Batch finished: 1000, Accuracy: 0.002000, Loss: 5.479743
Total Batch finished: 2000, Accuracy: 0.003000, Loss: 5.490244
Total Batch finished: 3000, Accuracy: 0.003667, Loss: 5.481567
Total Batch finished: 4000, Accuracy: 0.004750, Loss: 5.490140
Total Batch finished: 5000, Accuracy: 0.004800, Loss: 5.493230
Total Batch finished: 6000, Accuracy: 0.005833, Loss: 5.483940
Total Batch finished: 7000, Accuracy: 0.006000, Loss: 5.482946
Total Batch finished: 8000, Accuracy: 0.006375, Loss: 5.488143
Total Batch finished: 9000, Accuracy: 0.005889, Loss: 5.491115
Total Batch finished: 10000, Accuracy: 0.005700, Loss: 5.489407
Total Batch finished: 11000, Accuracy: 0.005818, Loss: 5.490407
Total Batch finished: 12000, Accuracy: 0.005833, Loss: 5.488543
Total Batch finished: 13000, Accuracy: 0.006154, Loss: 5.492821
Total Batch finished: 14000, Accuracy: 0.006000, Loss: 5.494476
Total Batch finished: 15000, Accuracy: 0.006000, Loss: 5.492944
Total Batch finished: 16000, Accuracy: 0.006063, Loss: 5.489813
Total Batch finished: 17000, Accuracy: 0.005941, Loss: 5.487576
Total Batch finished: 18000, Accuracy: 0.005778, Loss: 5.489187
Total Batch finished: 19000, Accuracy: 0.005895, Loss: 5.486287
Total Batch finished: 20000, Accuracy: 0.006150, Loss: 5.483567
Total Batch finished: 21000, Accuracy: 0.006190, Loss: 5.483275
Total Batch finished: 22000, Accuracy: 0.006364, Loss: 5.482443
Total Batch finished: 23000, Accuracy: 0.006217, Loss: 5.480974
Total Batch finished: 24000, Accuracy: 0.006083, Loss: 5.481584
Total Batch finished: 25000, Accuracy: 0.006040, Loss: 5.481026
Total Batch finished: 26000, Accuracy: 0.006000, Loss: 5.479528
Total Batch finished: 27000, Accuracy: 0.006037, Loss: 5.477651
Total Batch finished: 28000, Accuracy: 0.006071, Loss: 5.477294
Total Batch finished: 29000, Accuracy: 0.006069, Loss: 5.477197
Total Batch finished: 30000, Accuracy: 0.006067, Loss: 5.475989
Total Batch finished: 31000, Accuracy: 0.006000, Loss: 5.474656
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Total Batch finished: 32000, Accuracy: 0.005938, Loss: 5.473199  
Total Batch finished: 33000, Accuracy: 0.005848, Loss: 5.472074  
Total Batch finished: 34000, Accuracy: 0.005765, Loss: 5.472054  
Total Batch finished: 35000, Accuracy: 0.005771, Loss: 5.470270  
Total Batch finished: 36000, Accuracy: 0.005750, Loss: 5.469306  
Total Batch finished: 37000, Accuracy: 0.005757, Loss: 5.468078  
Total Batch finished: 38000, Accuracy: 0.005816, Loss: 5.466606  
Total Batch finished: 39000, Accuracy: 0.005897, Loss: 5.465841  
Total Batch finished: 40000, Accuracy: 0.005850, Loss: 5.465690  
Total Batch finished: 41000, Accuracy: 0.005878, Loss: 5.465513  
Total Batch finished: 42000, Accuracy: 0.005786, Loss: 5.465071  
Total Batch finished: 43000, Accuracy: 0.005767, Loss: 5.464409  
Total Batch finished: 44000, Accuracy: 0.005750, Loss: 5.464672  
Total Batch finished: 45000, Accuracy: 0.005689, Loss: 5.464041  
Total Batch finished: 46000, Accuracy: 0.005783, Loss: 5.463069  
Total Batch finished: 47000, Accuracy: 0.005830, Loss: 5.461734  
Total Batch finished: 48000, Accuracy: 0.005854, Loss: 5.461289  
Total Batch finished: 49000, Accuracy: 0.005857, Loss: 5.460615  
Total Batch finished: 50000, Accuracy: 0.005840, Loss: 5.459773  
Total Batch finished: 51000, Accuracy: 0.005824, Loss: 5.459047  
Total Batch finished: 52000, Accuracy: 0.005827, Loss: 5.458554  
Total Batch finished: 53000, Accuracy: 0.005925, Loss: 5.457924  
Total Batch finished: 54000, Accuracy: 0.005963, Loss: 5.456963  
Total Batch finished: 55000, Accuracy: 0.005945, Loss: 5.456048  
Total Batch finished: 56000, Accuracy: 0.005982, Loss: 5.455355  
Total Batch finished: 57000, Accuracy: 0.005947, Loss: 5.454911  
Total Batch finished: 58000, Accuracy: 0.005931, Loss: 5.454813  
Total Batch finished: 59000, Accuracy: 0.005915, Loss: 5.454001  
Total Batch finished: 60000, Accuracy: 0.005933, Loss: 5.453435  
Total Batch finished: 61000, Accuracy: 0.006049, Loss: 5.452849  
Total Batch finished: 62000, Accuracy: 0.006097, Loss: 5.452340  
Total Batch finished: 63000, Accuracy: 0.006079, Loss: 5.452393  
Total Batch finished: 64000, Accuracy: 0.006047, Loss: 5.452193  
Total Batch finished: 65000, Accuracy: 0.006092, Loss: 5.451472  
Total Batch finished: 66000, Accuracy: 0.006076, Loss: 5.450446  
Total Batch finished: 67000, Accuracy: 0.006090, Loss: 5.450040  
Total Batch finished: 68000, Accuracy: 0.006029, Loss: 5.449599  
Total Batch finished: 69000, Accuracy: 0.006087, Loss: 5.448635  
Total Batch finished: 70000, Accuracy: 0.006071, Loss: 5.448152  
Total Batch finished: 71000, Accuracy: 0.006085, Loss: 5.447477  
Total Batch finished: 72000, Accuracy: 0.006111, Loss: 5.447162  
Total Batch finished: 73000, Accuracy: 0.006123, Loss: 5.446443  
Total Batch finished: 74000, Accuracy: 0.006122, Loss: 5.445727  
Total Batch finished: 75000, Accuracy: 0.006093, Loss: 5.445606  
Total Batch finished: 76000, Accuracy: 0.006118, Loss: 5.445412  
Total Batch finished: 77000, Accuracy: 0.006091, Loss: 5.444701  
Total Batch finished: 78000, Accuracy: 0.006077, Loss: 5.444073  
Total Batch finished: 79000, Accuracy: 0.006089, Loss: 5.443658  
Total Batch finished: 80000, Accuracy: 0.006125, Loss: 5.443084  
Total Batch finished: 81000, Accuracy: 0.006111, Loss: 5.442833  
Total Batch finished: 82000, Accuracy: 0.006122, Loss: 5.442205  
Total Batch finished: 83000, Accuracy: 0.006120, Loss: 5.441838  
Total Batch finished: 84000, Accuracy: 0.006119, Loss: 5.441751  
Total Batch finished: 85000, Accuracy: 0.006141, Loss: 5.441189  
Total Batch finished: 86000, Accuracy: 0.006151, Loss: 5.440955  
Total Batch finished: 87000, Accuracy: 0.006184, Loss: 5.440370  
Total Batch finished: 88000, Accuracy: 0.006205, Loss: 5.439500  
Total Batch finished: 89000, Accuracy: 0.006213, Loss: 5.439397  
Total Batch finished: 90000, Accuracy: 0.006200, Loss: 5.438621  
Total Batch finished: 91000, Accuracy: 0.006209, Loss: 5.438157  
Total Batch finished: 92000, Accuracy: 0.006207, Loss: 5.437645  
Total Batch finished: 93000, Accuracy: 0.006215, Loss: 5.437080  
Total Batch finished: 94000, Accuracy: 0.006223, Loss: 5.436754  
Total Batch finished: 95000, Accuracy: 0.006200, Loss: 5.436260  
Total Batch finished: 96000, Accuracy: 0.006208, Loss: 5.435833  
Total Batch finished: 97000, Accuracy: 0.006206, Loss: 5.435268  
Total Batch finished: 98000, Accuracy: 0.006194, Loss: 5.434889

Total Batch finished: 99000, Accuracy: 0.006253, Loss: 5.434396  
Total Batch finished: 100000, Accuracy: 0.006260, Loss: 5.433777  
(1, 'Train Accuracy:', 0.0062600000668317076, 'Train Loss:', 5.4337768030166629)  
Batching Validation...  
( 'Test Accuracy:', 0.0056500001344829799)  
Total Batch finished: 1000, Accuracy: 0.001000, Loss: 5.381352  
Total Batch finished: 2000, Accuracy: 0.004500, Loss: 5.383162  
Total Batch finished: 3000, Accuracy: 0.004333, Loss: 5.376751  
Total Batch finished: 4000, Accuracy: 0.006500, Loss: 5.382575  
Total Batch finished: 5000, Accuracy: 0.006000, Loss: 5.387156  
Total Batch finished: 6000, Accuracy: 0.006000, Loss: 5.378285  
Total Batch finished: 7000, Accuracy: 0.006857, Loss: 5.377839  
Total Batch finished: 8000, Accuracy: 0.006625, Loss: 5.382937  
Total Batch finished: 9000, Accuracy: 0.006444, Loss: 5.385758  
Total Batch finished: 10000, Accuracy: 0.006300, Loss: 5.384106  
Total Batch finished: 11000, Accuracy: 0.006545, Loss: 5.384624  
Total Batch finished: 12000, Accuracy: 0.006583, Loss: 5.383422  
Total Batch finished: 13000, Accuracy: 0.006846, Loss: 5.386937  
Total Batch finished: 14000, Accuracy: 0.006786, Loss: 5.388535  
Total Batch finished: 15000, Accuracy: 0.006733, Loss: 5.387891  
Total Batch finished: 16000, Accuracy: 0.006813, Loss: 5.385736  
Total Batch finished: 17000, Accuracy: 0.006647, Loss: 5.385311  
Total Batch finished: 18000, Accuracy: 0.006611, Loss: 5.387084  
Total Batch finished: 19000, Accuracy: 0.006684, Loss: 5.385065  
Total Batch finished: 20000, Accuracy: 0.006700, Loss: 5.383726  
Total Batch finished: 21000, Accuracy: 0.006952, Loss: 5.383177  
Total Batch finished: 22000, Accuracy: 0.007136, Loss: 5.383243  
Total Batch finished: 23000, Accuracy: 0.007043, Loss: 5.382988  
Total Batch finished: 24000, Accuracy: 0.006917, Loss: 5.384209  
Total Batch finished: 25000, Accuracy: 0.006920, Loss: 5.384313  
Total Batch finished: 26000, Accuracy: 0.006962, Loss: 5.383778  
Total Batch finished: 27000, Accuracy: 0.006926, Loss: 5.382632  
Total Batch finished: 28000, Accuracy: 0.006929, Loss: 5.382756  
Total Batch finished: 29000, Accuracy: 0.006966, Loss: 5.383212  
Total Batch finished: 30000, Accuracy: 0.006933, Loss: 5.382529  
Total Batch finished: 31000, Accuracy: 0.006806, Loss: 5.381689  
Total Batch finished: 32000, Accuracy: 0.006969, Loss: 5.381146  
Total Batch finished: 33000, Accuracy: 0.006909, Loss: 5.380485  
Total Batch finished: 34000, Accuracy: 0.006824, Loss: 5.380837  
Total Batch finished: 35000, Accuracy: 0.006857, Loss: 5.379764  
Total Batch finished: 36000, Accuracy: 0.006861, Loss: 5.379232  
Total Batch finished: 37000, Accuracy: 0.006892, Loss: 5.378420  
Total Batch finished: 38000, Accuracy: 0.006921, Loss: 5.377401  
Total Batch finished: 39000, Accuracy: 0.007026, Loss: 5.377096  
Total Batch finished: 40000, Accuracy: 0.006925, Loss: 5.377070  
Total Batch finished: 41000, Accuracy: 0.006902, Loss: 5.377288  
Total Batch finished: 42000, Accuracy: 0.006786, Loss: 5.377301  
Total Batch finished: 43000, Accuracy: 0.006744, Loss: 5.377070  
Total Batch finished: 44000, Accuracy: 0.006705, Loss: 5.377648  
Total Batch finished: 45000, Accuracy: 0.006644, Loss: 5.377412  
Total Batch finished: 46000, Accuracy: 0.006696, Loss: 5.376958  
Total Batch finished: 47000, Accuracy: 0.006723, Loss: 5.376267  
Total Batch finished: 48000, Accuracy: 0.006729, Loss: 5.376096  
Total Batch finished: 49000, Accuracy: 0.006776, Loss: 5.375744  
Total Batch finished: 50000, Accuracy: 0.006800, Loss: 5.375226  
Total Batch finished: 51000, Accuracy: 0.006804, Loss: 5.374927  
Total Batch finished: 52000, Accuracy: 0.006788, Loss: 5.374801  
Total Batch finished: 53000, Accuracy: 0.006849, Loss: 5.374448  
Total Batch finished: 54000, Accuracy: 0.006907, Loss: 5.373982  
Total Batch finished: 55000, Accuracy: 0.006945, Loss: 5.373558  
Total Batch finished: 56000, Accuracy: 0.006982, Loss: 5.373340  
Total Batch finished: 57000, Accuracy: 0.006947, Loss: 5.373404  
Total Batch finished: 58000, Accuracy: 0.006897, Loss: 5.373503  
Total Batch finished: 59000, Accuracy: 0.006831, Loss: 5.373150  
Total Batch finished: 60000, Accuracy: 0.006817, Loss: 5.372953  
Total Batch finished: 61000, Accuracy: 0.006951, Loss: 5.372764  
Total Batch finished: 62000, Accuracy: 0.007016, Loss: 5.372609

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Total Batch finished: 63000, Accuracy: 0.007016, Loss: 5.372927
Total Batch finished: 64000, Accuracy: 0.006938, Loss: 5.373056
Total Batch finished: 65000, Accuracy: 0.007077, Loss: 5.372743
Total Batch finished: 66000, Accuracy: 0.007030, Loss: 5.372263
Total Batch finished: 67000, Accuracy: 0.007045, Loss: 5.372188
Total Batch finished: 68000, Accuracy: 0.007015, Loss: 5.372039
Total Batch finished: 69000, Accuracy: 0.007072, Loss: 5.371559
Total Batch finished: 70000, Accuracy: 0.007057, Loss: 5.371421
Total Batch finished: 71000, Accuracy: 0.007042, Loss: 5.371019
Total Batch finished: 72000, Accuracy: 0.007083, Loss: 5.370976
Total Batch finished: 73000, Accuracy: 0.007068, Loss: 5.370638
Total Batch finished: 74000, Accuracy: 0.007081, Loss: 5.370270
Total Batch finished: 75000, Accuracy: 0.007067, Loss: 5.370361
Total Batch finished: 76000, Accuracy: 0.007132, Loss: 5.370399
Total Batch finished: 77000, Accuracy: 0.007104, Loss: 5.369990
Total Batch finished: 78000, Accuracy: 0.007128, Loss: 5.369643
Total Batch finished: 79000, Accuracy: 0.007152, Loss: 5.369570
Total Batch finished: 80000, Accuracy: 0.007175, Loss: 5.369215
Total Batch finished: 81000, Accuracy: 0.007185, Loss: 5.369228
Total Batch finished: 82000, Accuracy: 0.007171, Loss: 5.368905
Total Batch finished: 83000, Accuracy: 0.007169, Loss: 5.368844
Total Batch finished: 84000, Accuracy: 0.007155, Loss: 5.368921
Total Batch finished: 85000, Accuracy: 0.007165, Loss: 5.368658
Total Batch finished: 86000, Accuracy: 0.007140, Loss: 5.368707
Total Batch finished: 87000, Accuracy: 0.007126, Loss: 5.368450
Total Batch finished: 88000, Accuracy: 0.007114, Loss: 5.368028
Total Batch finished: 89000, Accuracy: 0.007135, Loss: 5.368134
Total Batch finished: 90000, Accuracy: 0.007111, Loss: 5.367625
Total Batch finished: 91000, Accuracy: 0.007099, Loss: 5.367487
Total Batch finished: 92000, Accuracy: 0.007163, Loss: 5.367218
Total Batch finished: 93000, Accuracy: 0.007151, Loss: 5.366961
Total Batch finished: 94000, Accuracy: 0.007128, Loss: 5.366835
Total Batch finished: 95000, Accuracy: 0.007095, Loss: 5.366612
Total Batch finished: 96000, Accuracy: 0.007094, Loss: 5.366422
Total Batch finished: 97000, Accuracy: 0.007062, Loss: 5.366107
Total Batch finished: 98000, Accuracy: 0.007061, Loss: 5.365975
Total Batch finished: 99000, Accuracy: 0.007081, Loss: 5.365779
Total Batch finished: 100000, Accuracy: 0.007080, Loss: 5.365417
(2, 'Train Accuracy:', 0.0070800000603776425, 'Train Loss:', 5.3654170894622801)
Batching Validation...
('Test Accuracy:', 0.005833333466822902)
Total Batch finished: 1000, Accuracy: 0.004000, Loss: 5.344156
Total Batch finished: 2000, Accuracy: 0.006000, Loss: 5.342611
Total Batch finished: 3000, Accuracy: 0.006333, Loss: 5.336905
Total Batch finished: 4000, Accuracy: 0.008000, Loss: 5.343454
Total Batch finished: 5000, Accuracy: 0.007400, Loss: 5.346905
Total Batch finished: 6000, Accuracy: 0.007000, Loss: 5.338846
Total Batch finished: 7000, Accuracy: 0.008000, Loss: 5.338219
Total Batch finished: 8000, Accuracy: 0.007875, Loss: 5.343359
Total Batch finished: 9000, Accuracy: 0.007444, Loss: 5.345622
Total Batch finished: 10000, Accuracy: 0.007300, Loss: 5.344566
Total Batch finished: 11000, Accuracy: 0.007364, Loss: 5.345000
Total Batch finished: 12000, Accuracy: 0.007500, Loss: 5.344393
Total Batch finished: 13000, Accuracy: 0.007462, Loss: 5.347059
Total Batch finished: 14000, Accuracy: 0.007429, Loss: 5.348083
Total Batch finished: 15000, Accuracy: 0.007467, Loss: 5.347557
Total Batch finished: 16000, Accuracy: 0.007563, Loss: 5.345695
Total Batch finished: 17000, Accuracy: 0.007529, Loss: 5.345538
Total Batch finished: 18000, Accuracy: 0.007667, Loss: 5.347396
Total Batch finished: 19000, Accuracy: 0.007737, Loss: 5.345883
Total Batch finished: 20000, Accuracy: 0.007750, Loss: 5.344983
Total Batch finished: 21000, Accuracy: 0.007857, Loss: 5.344225
Total Batch finished: 22000, Accuracy: 0.007864, Loss: 5.344542
Total Batch finished: 23000, Accuracy: 0.007739, Loss: 5.344402
Total Batch finished: 24000, Accuracy: 0.007625, Loss: 5.345571
Total Batch finished: 25000, Accuracy: 0.007520, Loss: 5.345869
Total Batch finished: 26000, Accuracy: 0.007500, Loss: 5.345479
```