练习1：mnist数据集 的图片分类

代码：

%matplotlib inline

import keras

import numpy as np

import matplotlib.pyplot as plt

plt.rcParams['figure.figsize']=(7,7)

from keras.datasets import mnist

from keras.models import Sequential

from keras.layers.core import Dense,Dropout,Activation

from keras.utils import np\_utils

#获取mnist数据集，由于下载原因，选择本地文件读取。

nb\_classes= 10

(x\_train,y\_train),(x\_test,y\_test)=mnist.load\_data(path=r"mnist.npz")

#更改样本形状

x\_train=x\_train.reshape(60000,784)

x\_test=x\_test.reshape(10000,784)

x\_train=x\_train.astype('float32')

x\_test=x\_test.astype('float32')

x\_train/=255

x\_test/=255

y\_train=np\_utils.to\_categorical(y\_train,nb\_classes)

y\_test=np\_utils.to\_categorical(y\_test,nb\_classes)

#建立神经网络

model=Sequential()

model.add(Dense(512,input\_shape=(784,)))

model.add(Activation('relu'))

model.add(Dropout(0.2))

model.add(Dense(512))

model.add(Activation('relu'))

model.add(Dropout(0.2))

model.add(Dense(10))

model.add(Activation('softmax'))

#编译模型

model.compile(loss='categorical\_crossentropy',optimizer='adam',metrics=['accuracy'])

#开始训练

model.fit(x\_train,y\_train,

batch\_size=128,epochs=4,

validation\_data=(x\_test,y\_test))

#评估准确性

score = model.evaluate(x\_test, y\_test,verbose=0)

print('Test score:', score[0])

print('Test accuracy:', score[1])

#预测测试集

predicted\_classes = model.predict\_classes(x\_test)

correct\_indices=np.nonzero(predicted\_classes == y\_test)[0]

incorrect\_indices=np.nonzero(predicted\_classes != y\_test)[0]

#绘制测试图像

plt.figure()

for i, correct in enumerate(correct\_indices[:9]):

plt.subplot(3,3,i+1)

plt.imshow(x\_test[correct].reshape(28,28), cmap='gray', interpolation='none')

plt.title("Predicted {}, Class {}".format(predicted\_classes[correct], y\_test[correct]))

plt.figure()

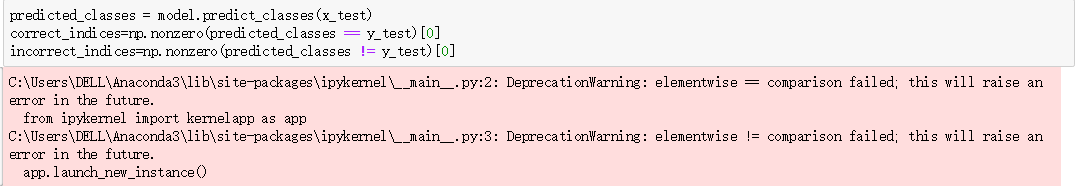
for i, incorrect in enumerate(incorrect\_indices[:9]):

plt.subplot(3,3,i+1)

plt.imshow(x\_test[incorrect].reshape(28,28), cmap='gray', interpolation='none')

plt.title("Predicted {}, Class {}".format(predicted\_classes[incorrect], y\_test[incorrect]))

发现问题

出现警告，导致图片输出只有第一例，推测问题可能为predicted\_classes 与 y\_test 维度不同，仍未解决。