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import keras
from keras.datasets import mnist
from keras.models import Sequential
from keras.layers import Dense, Dropout, Flatten
from keras.layers import Conv2D, MaxPooling2D
from keras import backend as K

batch_size = 128
num_classes = 10
epochs = 12
img_rows, img_cols = 28, 28
(x_train, y_train), (x_test, y_test) = mnist.load_data()
if K.image_data_format() == 'channels_first':
    x_train = x_train.reshape(x_train.shape[0], 1, img_rows, img_cols)
    x_test = x_test.reshape(x_test.shape[0], 1, img_rows, img_cols)
    input_shape = (1, img_rows, img_cols)
else:
    x_train = x_train.reshape(x_train.shape[0], img_rows, img_cols, 1)
    x_test = x_test.reshape(x_test.shape[0], img_rows, img_cols, 1)
    input_shape = (img_rows, img_cols, 1)

x_train = x_train.astype('float32')
x_test = x_test.astype('float32')
x_train /= 255
x_test /= 255
print('x_train shape:', x_train.shape)
print(x_train.shape[0], 'train samples')
print(x_test.shape[0], 'test samples')

x_train shape: (60000, 28, 28, 1)
60000 train samples
10000 test samples

from tensorflow.keras.utils import to_categorical
y_train = to_categorical(y_train, num_classes)
y_test = to_categorical(y_test, num_classes)

model = Sequential()
model.add(Conv2D(32, kernel_size=(3, 3), activation='relu', input_shape=input_shape))
model.add(Conv2D(64, (3, 3), activation='relu', input_shape=input_shape))
model.add(MaxPooling2D(pool_size=(2, 2)))
model.add(Dropout(0.25))
model.add(Flatten())
model.add(Dense(128, activation='relu'))
model.add(Dropout(0.5))
model.add(Dense(num_classes, activation='softmax'))

model.compile(loss=keras.losses.categorical_crossentropy, optimizer='adam', metrics=['accuracy'])
trained_model = model.fit(x_train, y_train, batch_size=batch_size, epochs=epochs, verbose=1, validation_data=(x_test, y_test))

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Epoch 1/12
469/469 [=====] - 94s 194ms/step - loss: 0.2378 - accuracy:
Epoch 2/12
469/469 [=====] - 100s 214ms/step - loss: 0.0835 - accuracy
Epoch 3/12
469/469 [=====] - 91s 194ms/step - loss: 0.0633 - accuracy:
Epoch 4/12
469/469 [=====] - 102s 217ms/step - loss: 0.0548 - accuracy
Epoch 5/12
469/469 [=====] - 87s 187ms/step - loss: 0.0455 - accuracy:
Epoch 6/12
469/469 [=====] - 94s 200ms/step - loss: 0.0382 - accuracy:
Epoch 7/12
469/469 [=====] - 90s 192ms/step - loss: 0.0338 - accuracy:
Epoch 8/12
469/469 [=====] - 92s 197ms/step - loss: 0.0305 - accuracy:
Epoch 9/12
392/469 [=====>.....] - ETA: 14s - loss: 0.0292 - accuracy: 0.9904