

```

from keras.datasets import mnist

data = mnist.load_data()

((X_train, y_train), (X_test, y_test)) = data

X_train = X_train.reshape((X_train.shape[0],28*28)).astype('float32')
X_test = X_test.reshape((X_test.shape[0],28*28)).astype('float32')

X_train = X_train / 255
X_test = X_test / 255

from keras.utils import np_utils

print(y_test.shape)

y_train = np_utils.to_categorical(y_train)
y_test = np_utils.to_categorical(y_test)

num_classes = y_test.shape[1]
print(y_test.shape)

(10000,)
(10000, 10)

from keras.models import Sequential
from keras.layers import Dense

model = Sequential()
model.add(Dense(32, input_dim = 28*28, activation='relu'))
model.add(Dense(64,activation='relu'))
model.add(Dense(10,activation = 'softmax'))

model.compile(loss='categorical_crossentropy', optimizer='adam', metrics=['accuracy'])

model.summary()

```

Model: "sequential_4"

Layer (type)	Output Shape	Param #
dense_12 (Dense)	(None, 32)	25120
dense_13 (Dense)	(None, 64)	2112
dense_14 (Dense)	(None, 10)	650
Total params: 27,882		
Trainable params: 27,882		

Non-trainable params: 0

```
model.fit(X_train, y_train, epochs=10, batch_size=100)
```

```
Epoch 1/10
600/600 [=====] - 2s 2ms/step - loss: 0.7628 - accurac
Epoch 2/10
600/600 [=====] - 1s 2ms/step - loss: 0.2038 - accurac
Epoch 3/10
600/600 [=====] - 1s 2ms/step - loss: 0.1564 - accurac
Epoch 4/10
600/600 [=====] - 1s 2ms/step - loss: 0.1268 - accurac
Epoch 5/10
600/600 [=====] - 1s 2ms/step - loss: 0.1071 - accurac
Epoch 6/10
600/600 [=====] - 1s 2ms/step - loss: 0.0949 - accurac
Epoch 7/10
600/600 [=====] - 1s 2ms/step - loss: 0.0838 - accurac
Epoch 8/10
600/600 [=====] - 1s 2ms/step - loss: 0.0748 - accurac
Epoch 9/10
600/600 [=====] - 1s 2ms/step - loss: 0.0688 - accurac
Epoch 10/10
600/600 [=====] - 1s 2ms/step - loss: 0.0606 - accurac
<tensorflow.python.keras.callbacks.History at 0x7f6a19b745d0>
```

```
scores = model.evaluate(X_test, y_test)
print(scores)
```

```
313/313 [=====] - 0s 1ms/step - loss: 0.1035 - accurac
[0.10348839312791824, 0.9718999862670898]
```