```
from keras.models import Sequential

from keras.layers import Dense, Conv2D, Flatten
import numpy as np
#TODO: get train and test data
from keras.datasets import mnist

(X_train, y_train), (X_test, y_test) = mnist.load_data()

X_train = X_train.reshape(60000,28,28,1)

X_test = X_test.reshape(10000,28,28,1)

y_train = to_categorical(y_train)

y_test = to_categorical(y_test)

y_train[0]

#set up the model
model = Sequential()

#add convultional layer
model.add(Conv2D(64, kernel_size=3, activation="relu", input_shape=(28,28,1)))

#TODO: might add some other Dense layers here and Flatten()
model.add(Flatten())

model.add(Dense(10, activation="softmax"))

#compile the model by lsetting the optimizer and loss and metrics
model.compile(optimizer="adam", loss="categorical_crossentropy", metrics=["accuracy"])

#fit to train and test
model.fit(X_train, y_train, validation_data=(X_test, y_test), epochs=3)

#prediction
model.predict(X_test[:4])
```

```
y_test[:4]
```

```
import skimage.data

img = skimage.data.chelsea()

img = skimage.color.rgb2gray(img)

l1_filter = numpy.zeros((2,3,3))
l1_filter[0, :, :] = numpy.array([[[-1, 0, 1],
                                   [-1, 0, 1],
```

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                                    [-1, 0, 1]]])
l1_filter[1, :, :] = numpy.array([[[1,   1,  1],
                                   [0,   0,  0],
                                   [-1, -1, -1]]])
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-20-da9938da789d> in <module>()
     12 X_test = X_test.reshape(10000,28,28,1)
     13
---> 14 y_train = to_categorical(y_train)
     15
     16 y_test = to_categorical(y_test)

NameError: name 'to_categorical' is not defined
```

SEARCH STACK OVERFLOW