In [1]:
```python
# Load imports
from scipy.io import wavfile as wav
import numpy as np
import IPython.display as ipd
import librosa
import librosa.display
import matplotlib.pyplot as plt
```

In [2]:
```python
import pandas as pd
filepath_or_buffer = '/home/ece/Videos/bike sp hj.csv'
pd.read_fwf(filepath_or_buffer, colspecs='infer', widths=None, infer_nrows=100)
```

Out[2]:

	file_name,class_name
0	2008 Kawasaki Ninja 250r.wav,KAWASAKI
1	Harley.wav,HARLEY
2	Harley-Davidson .wav,HARLEY
3	KTM Duke.wav,KTM
4	KTMRC125o.wav,KTM
...	...
235	KTM16.wav,KTM
236	KTM17.wav,KTM
237	KTM18.wav,KTM
238	KTM19.wav,KTM
239	KTM20.wav,KTM

240 rows × 1 columns

In [3]:
```python
def extract_features(file_name):

    try:
        audio, sample_rate = librosa.load(file_name, res_type='kaiser_fast')
        mfccs = librosa.feature.mfcc(y=audio, sr=sample_rate, n_mfcc=40)
        mfccsscaled = np.mean(mfccs.T,axis=0)

    except Exception as e:
        print("Error encountered while parsing file: ", file)
        return None

    return mfccsscaled
```

In [4]:
```python
# Load various imports
import pandas as pd
import os
import librosa

# Set the path to the full UrbanSound dataset
fulldatasetpath = '/home/ece/Videos/bike sp'

metadata = pd.read_csv('/home/ece/Videos/bike sp hj.csv')

features = []

# Iterate through each sound file and extract the features
for index, row in metadata.iterrows():
```

```
        file_name = os.path.join(os.path.abspath(fulldatasetpath),str(row["file_name"]))
        class_label = row["class_name"]

        data = extract_features(file_name)

        features.append([data, class_label])

    # Convert into a Panda dataframe
    featuresdf = pd.DataFrame(features, columns=['feature','class_label'])

    print('Finished feature extraction from ', len(featuresdf), ' files')
```

```
Finished feature extraction from  240  files
```

In [5]:
```python
print(metadata.class_name.value_counts())
```

```
KTM         40
HARLEY      40
PULSAR      40
ENFIELD     40
APACHE      40
KAWASAKI    40
Name: class_name, dtype: int64
```

In [7]:
```python
import pickle
file1=open('/home/ece/Music/features FINAL','wb')
pickle.dump(featuresdf,file1)
file1.close()
```

In [8]:
```python
from sklearn.preprocessing import LabelEncoder
from keras.utils import to_categorical
import numpy as np

# Convert features and corresponding classification labels into numpy arrays
X = np.array(featuresdf.feature.tolist())
y = np.array(featuresdf.class_label.tolist())

# Encode the classification labels
le = LabelEncoder()
yy = to_categorical(le.fit_transform(y))
```

In [9]:
```python
# split the dataset
from sklearn.model_selection import train_test_split

x_train, x_test, y_train, y_test = train_test_split(X, yy, test_size=0.30, random_state = 42)
```

In [10]:
```python
import numpy as np
from keras.models import Sequential
from keras.layers import Dense, Dropout, Activation, Flatten
from keras.layers import Convolution2D, MaxPooling2D
from keras.optimizers import Adam
from keras.utils import np_utils
from sklearn import metrics

num_labels = yy.shape[1]
filter_size = 4

# Construct model
model = Sequential()

model.add(Dense(256, input_shape=(40,)))
model.add(Activation('relu'))
model.add(Dropout(0.5))
```

```python
model.add(Dense(256))
model.add(Activation('relu'))
model.add(Dropout(0.5))

model.add(Dense(256))
model.add(Activation('relu'))
model.add(Dropout(0.5))

model.add(Dense(256))
model.add(Activation('relu'))
model.add(Dropout(0.5))


model.add(Dense(num_labels))
model.add(Activation('softmax'))
```

In [11]:
```python
# Compile the model
model.compile(loss='categorical_crossentropy', metrics=['accuracy'], optimizer='adam')
```

In [18]:
```python
# Display model architecture summary
model.summary()

# Calculate pre-training accuracy
score = model.evaluate(x_test, y_test, verbose=0)
accuracy = 100*score[1]

print("Pre-training accuracy: %.4f%%" % accuracy)
```

Model: "sequential"

Layer (type)	Output Shape	Param #
dense (Dense)	(None, 256)	10496
activation (Activation)	(None, 256)	0
dropout (Dropout)	(None, 256)	0
dense_1 (Dense)	(None, 256)	65792
activation_1 (Activation)	(None, 256)	0
dropout_1 (Dropout)	(None, 256)	0
dense_2 (Dense)	(None, 256)	65792
activation_2 (Activation)	(None, 256)	0
dropout_2 (Dropout)	(None, 256)	0
dense_3 (Dense)	(None, 256)	65792
activation_3 (Activation)	(None, 256)	0
dropout_3 (Dropout)	(None, 256)	0
dense_4 (Dense)	(None, 6)	1542
activation_4 (Activation)	(None, 6)	0

Total params: 209,414
Trainable params: 209,414
Non-trainable params: 0

Pre-training accuracy: 98.6111%

In [22]:
```python
from keras.callbacks import ModelCheckpoint
from datetime import datetime

num_epochs = 400
num_batch_size = 32

checkpointer = ModelCheckpoint(filepath='/home/ece/Music/weigh FINALfeatures.hdf5',
                               verbose=1, save_best_only=True)
start = datetime.now()

model.fit(x_train, y_train, batch_size=num_batch_size, epochs=num_epochs, validation_data=(x_test, y_test), callbacks=[checkpointer], verbose=1)


duration = datetime.now() - start
print("Training completed in time: ", duration)
```

```
Epoch 1/400
6/6 [==============================] - 0s 21ms/step - loss: 0.0026 - accuracy: 1.0000 - val_loss: 0.3460 - val_accuracy: 0.9861

Epoch 00001: val_loss improved from inf to 0.34602, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 2/400
6/6 [==============================] - 0s 13ms/step - loss: 2.5837e-04 - accuracy: 1.0000 - val_loss: 0.2588 - val_accuracy: 0.9861

Epoch 00002: val_loss improved from 0.34602 to 0.25885, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 3/400
6/6 [==============================] - 0s 16ms/step - loss: 0.1211 - accuracy: 0.9762 - val_loss: 0.2302 - val_accuracy: 0.9722

Epoch 00003: val_loss improved from 0.25885 to 0.23018, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 4/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0923 - accuracy: 0.9762 - val_loss: 0.2529 - val_accuracy: 0.9861

Epoch 00004: val_loss did not improve from 0.23018
Epoch 5/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0101 - accuracy: 0.9940 - val_loss: 0.3010 - val_accuracy: 0.9861

Epoch 00005: val_loss did not improve from 0.23018
Epoch 6/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0116 - accuracy: 0.9940 - val_loss: 0.3258 - val_accuracy: 0.9861

Epoch 00006: val_loss did not improve from 0.23018
Epoch 7/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0141 - accuracy: 1.0000 - val_loss: 0.3395 - val_accuracy: 0.9861

Epoch 00007: val_loss did not improve from 0.23018
Epoch 8/400
6/6 [==============================] - 0s 11ms/step - loss: 0.0030 - accuracy: 1.0000 - val_loss: 0.3439 - val_accuracy: 0.9861

Epoch 00008: val_loss did not improve from 0.23018
Epoch 9/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0439 - accuracy: 0.9940 - val_loss: 0.3453 - val_accuracy: 0.9861

Epoch 00009: val_loss did not improve from 0.23018
Epoch 10/400
6/6 [==============================] - 0s 11ms/step - loss: 0.0182 - accuracy: 0.9940 - val_loss: 0.3463 - val_accuracy: 0.9861

Epoch 00010: val_loss did not improve from 0.23018
Epoch 11/400
6/6 [==============================] - 0s 13ms/step - loss: 0.1176 - accuracy: 0.9821 - val_loss: 0.3699 - val_accuracy: 0.9861

Epoch 00011: val_loss did not improve from 0.23018
Epoch 12/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0121 - accuracy: 0.9940 - val_loss: 0.3464 - val_accuracy: 0.9861

Epoch 00012: val_loss did not improve from 0.23018
Epoch 13/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0445 - accuracy: 0.9881 - val_loss: 0.3192 - val_accuracy: 0.9861

Epoch 00013: val_loss did not improve from 0.23018
```

```
Epoch 14/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0266 - accuracy: 0.9881 - val_loss: 0.3178 - val_accuracy: 0.9861

Epoch 00014: val_loss did not improve from 0.23018
Epoch 15/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0088 - accuracy: 0.9940 - val_loss: 0.3047 - val_accuracy: 0.9861

Epoch 00015: val_loss did not improve from 0.23018
Epoch 16/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0277 - accuracy: 0.9881 - val_loss: 0.2524 - val_accuracy: 0.9861

Epoch 00016: val_loss did not improve from 0.23018
Epoch 17/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0246 - accuracy: 0.9940 - val_loss: 0.2093 - val_accuracy: 0.9861

Epoch 00017: val_loss improved from 0.23018 to 0.20925, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 18/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0331 - accuracy: 0.9881 - val_loss: 0.1798 - val_accuracy: 0.9861

Epoch 00018: val_loss improved from 0.20925 to 0.17979, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 19/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0031 - accuracy: 1.0000 - val_loss: 0.1602 - val_accuracy: 0.9861

Epoch 00019: val_loss improved from 0.17979 to 0.16021, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 20/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0193 - accuracy: 0.9940 - val_loss: 0.1742 - val_accuracy: 0.9861

Epoch 00020: val_loss did not improve from 0.16021
Epoch 21/400
6/6 [==============================] - 0s 11ms/step - loss: 0.0159 - accuracy: 0.9940 - val_loss: 0.1818 - val_accuracy: 0.9861

Epoch 00021: val_loss did not improve from 0.16021
Epoch 22/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0303 - accuracy: 0.9821 - val_loss: 0.2450 - val_accuracy: 0.9861

Epoch 00022: val_loss did not improve from 0.16021
Epoch 23/400
6/6 [==============================] - 0s 11ms/step - loss: 0.0182 - accuracy: 0.9940 - val_loss: 0.2717 - val_accuracy: 0.9861

Epoch 00023: val_loss did not improve from 0.16021
Epoch 24/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0222 - accuracy: 0.9940 - val_loss: 0.2820 - val_accuracy: 0.9861

Epoch 00024: val_loss did not improve from 0.16021
Epoch 25/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0168 - accuracy: 0.9881 - val_loss: 0.3072 - val_accuracy: 0.9861

Epoch 00025: val_loss did not improve from 0.16021
Epoch 26/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0102 - accuracy: 0.9940 - val_loss: 0.3342 - val_accuracy: 0.9861

Epoch 00026: val_loss did not improve from 0.16021
Epoch 27/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0154 - accuracy: 0.9940 - val_loss: 0.3179 - val_accuracy: 0.9861

Epoch 00027: val_loss did not improve from 0.16021
Epoch 28/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0990 - accuracy: 0.9881 - val_loss: 0.3117 - val_accuracy: 0.9861

Epoch 00028: val_loss did not improve from 0.16021
Epoch 29/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0140 - accuracy: 1.0000 - val_loss: 0.3329 - val_accuracy: 0.9861

Epoch 00029: val_loss did not improve from 0.16021
Epoch 30/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0016 - accuracy: 1.0000 - val_loss: 0.3435 - val_accuracy: 0.9861

Epoch 00030: val_loss did not improve from 0.16021
Epoch 31/400
```

```
6/6 [==============================] - 0s 13ms/step - loss: 4.3144e-04 - accuracy: 1.0000 - val_loss: 0.3508 - val_accuracy: 0.9861

Epoch 00031: val_loss did not improve from 0.16021
Epoch 32/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0017 - accuracy: 1.0000 - val_loss: 0.3544 - val_accuracy: 0.9861

Epoch 00032: val_loss did not improve from 0.16021
Epoch 33/400
6/6 [==============================] - 0s 13ms/step - loss: 0.1241 - accuracy: 0.9881 - val_loss: 0.2294 - val_accuracy: 0.9861

Epoch 00033: val_loss did not improve from 0.16021
Epoch 34/400
6/6 [==============================] - 0s 13ms/step - loss: 1.8790e-04 - accuracy: 1.0000 - val_loss: 0.1838 - val_accuracy: 0.9861

Epoch 00034: val_loss did not improve from 0.16021
Epoch 35/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0037 - accuracy: 1.0000 - val_loss: 0.1654 - val_accuracy: 0.9861

Epoch 00035: val_loss did not improve from 0.16021
Epoch 36/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0144 - accuracy: 0.9940 - val_loss: 0.1565 - val_accuracy: 0.9861

Epoch 00036: val_loss improved from 0.16021 to 0.15651, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 37/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0100 - accuracy: 0.9940 - val_loss: 0.1501 - val_accuracy: 0.9861

Epoch 00037: val_loss improved from 0.15651 to 0.15010, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 38/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0040 - accuracy: 1.0000 - val_loss: 0.1498 - val_accuracy: 0.9861

Epoch 00038: val_loss improved from 0.15010 to 0.14978, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 39/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0266 - accuracy: 0.9881 - val_loss: 0.1447 - val_accuracy: 0.9861

Epoch 00039: val_loss improved from 0.14978 to 0.14468, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 40/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0014 - accuracy: 1.0000 - val_loss: 0.1412 - val_accuracy: 0.9861

Epoch 00040: val_loss improved from 0.14468 to 0.14122, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 41/400
6/6 [==============================] - 0s 15ms/step - loss: 6.6486e-05 - accuracy: 1.0000 - val_loss: 0.1401 - val_accuracy: 0.9861

Epoch 00041: val_loss improved from 0.14122 to 0.14007, saving model to /home/ece/Music/weigh FINALfeatures.hdf5
Epoch 42/400
6/6 [==============================] - 0s 11ms/step - loss: 8.7312e-04 - accuracy: 1.0000 - val_loss: 0.1407 - val_accuracy: 0.9861

Epoch 00042: val_loss did not improve from 0.14007
Epoch 43/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0015 - accuracy: 1.0000 - val_loss: 0.1444 - val_accuracy: 0.9861

Epoch 00043: val_loss did not improve from 0.14007
Epoch 44/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0126 - accuracy: 0.9940 - val_loss: 0.1526 - val_accuracy: 0.9861

Epoch 00044: val_loss did not improve from 0.14007
Epoch 45/400
6/6 [==============================] - 0s 13ms/step - loss: 7.1113e-05 - accuracy: 1.0000 - val_loss: 0.1606 - val_accuracy: 0.9861

Epoch 00045: val_loss did not improve from 0.14007
Epoch 46/400
6/6 [==============================] - 0s 14ms/step - loss: 7.2480e-04 - accuracy: 1.0000 - val_loss: 0.1668 - val_accuracy: 0.9861

Epoch 00046: val_loss did not improve from 0.14007
Epoch 47/400
6/6 [==============================] - 0s 14ms/step - loss: 7.1816e-04 - accuracy: 1.0000 - val_loss: 0.1714 - val_accuracy: 0.9861

Epoch 00047: val_loss did not improve from 0.14007
Epoch 48/400
6/6 [==============================] - 0s 18ms/step - loss: 0.0112 - accuracy: 0.9940 - val_loss: 0.1771 - val_accuracy: 0.9861
```

```
Epoch 00048: val_loss did not improve from 0.14007
Epoch 49/400
6/6 [==============================] - 0s 21ms/step - loss: 0.0029 - accuracy: 1.0000 - val_loss: 0.1809 - val_accuracy: 0.9861

Epoch 00049: val_loss did not improve from 0.14007
Epoch 50/400
6/6 [==============================] - 0s 14ms/step - loss: 3.7052e-04 - accuracy: 1.0000 - val_loss: 0.1827 - val_accuracy: 0.9861

Epoch 00050: val_loss did not improve from 0.14007
Epoch 51/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0044 - accuracy: 1.0000 - val_loss: 0.1811 - val_accuracy: 0.9861

Epoch 00051: val_loss did not improve from 0.14007
Epoch 52/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0402 - accuracy: 0.9881 - val_loss: 0.1755 - val_accuracy: 0.9861

Epoch 00052: val_loss did not improve from 0.14007
Epoch 53/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0058 - accuracy: 0.9940 - val_loss: 0.1684 - val_accuracy: 0.9861

Epoch 00053: val_loss did not improve from 0.14007
Epoch 54/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0044 - accuracy: 1.0000 - val_loss: 0.1574 - val_accuracy: 0.9861

Epoch 00054: val_loss did not improve from 0.14007
Epoch 55/400
6/6 [==============================] - 0s 15ms/step - loss: 5.7875e-04 - accuracy: 1.0000 - val_loss: 0.1659 - val_accuracy: 0.9722

Epoch 00055: val_loss did not improve from 0.14007
Epoch 56/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0122 - accuracy: 0.9940 - val_loss: 0.1718 - val_accuracy: 0.9722

Epoch 00056: val_loss did not improve from 0.14007
Epoch 57/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0159 - accuracy: 0.9940 - val_loss: 0.1959 - val_accuracy: 0.9861

Epoch 00057: val_loss did not improve from 0.14007
Epoch 58/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0165 - accuracy: 0.9940 - val_loss: 0.2369 - val_accuracy: 0.9861

Epoch 00058: val_loss did not improve from 0.14007
Epoch 59/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0035 - accuracy: 1.0000 - val_loss: 0.2728 - val_accuracy: 0.9861

Epoch 00059: val_loss did not improve from 0.14007
Epoch 60/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0028 - accuracy: 1.0000 - val_loss: 0.2939 - val_accuracy: 0.9861

Epoch 00060: val_loss did not improve from 0.14007
Epoch 61/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0286 - accuracy: 0.9940 - val_loss: 0.3057 - val_accuracy: 0.9861

Epoch 00061: val_loss did not improve from 0.14007
Epoch 62/400
6/6 [==============================] - 0s 11ms/step - loss: 0.0024 - accuracy: 1.0000 - val_loss: 0.3119 - val_accuracy: 0.9861

Epoch 00062: val_loss did not improve from 0.14007
Epoch 63/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0324 - accuracy: 0.9940 - val_loss: 0.3160 - val_accuracy: 0.9861

Epoch 00063: val_loss did not improve from 0.14007
Epoch 64/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0030 - accuracy: 1.0000 - val_loss: 0.3216 - val_accuracy: 0.9861

Epoch 00064: val_loss did not improve from 0.14007
Epoch 65/400
6/6 [==============================] - 0s 13ms/step - loss: 1.4306e-04 - accuracy: 1.0000 - val_loss: 0.3255 - val_accuracy: 0.9861
```

```
Epoch 00065: val_loss did not improve from 0.14007
Epoch 66/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0199 - accuracy: 0.9940 - val_loss: 0.3292 - val_accuracy: 0.9861

Epoch 00066: val_loss did not improve from 0.14007
Epoch 67/400
6/6 [==============================] - 0s 15ms/step - loss: 5.3143e-04 - accuracy: 1.0000 - val_loss: 0.3327 - val_accuracy: 0.9861

Epoch 00067: val_loss did not improve from 0.14007
Epoch 68/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0017 - accuracy: 1.0000 - val_loss: 0.3334 - val_accuracy: 0.9861

Epoch 00068: val_loss did not improve from 0.14007
Epoch 69/400
6/6 [==============================] - 0s 14ms/step - loss: 3.3123e-04 - accuracy: 1.0000 - val_loss: 0.3332 - val_accuracy: 0.9861

Epoch 00069: val_loss did not improve from 0.14007
Epoch 70/400
6/6 [==============================] - 0s 13ms/step - loss: 9.8730e-04 - accuracy: 1.0000 - val_loss: 0.3356 - val_accuracy: 0.9861

Epoch 00070: val_loss did not improve from 0.14007
Epoch 71/400
6/6 [==============================] - 0s 13ms/step - loss: 7.5334e-04 - accuracy: 1.0000 - val_loss: 0.3382 - val_accuracy: 0.9722

Epoch 00071: val_loss did not improve from 0.14007
Epoch 72/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0023 - accuracy: 1.0000 - val_loss: 0.3383 - val_accuracy: 0.9722

Epoch 00072: val_loss did not improve from 0.14007
Epoch 73/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0039 - accuracy: 1.0000 - val_loss: 0.3349 - val_accuracy: 0.9861

Epoch 00073: val_loss did not improve from 0.14007
Epoch 74/400
6/6 [==============================] - 0s 13ms/step - loss: 3.2695e-05 - accuracy: 1.0000 - val_loss: 0.3325 - val_accuracy: 0.9861

Epoch 00074: val_loss did not improve from 0.14007
Epoch 75/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0018 - accuracy: 1.0000 - val_loss: 0.3294 - val_accuracy: 0.9861

Epoch 00075: val_loss did not improve from 0.14007
Epoch 76/400
6/6 [==============================] - 0s 15ms/step - loss: 4.2546e-04 - accuracy: 1.0000 - val_loss: 0.3274 - val_accuracy: 0.9861

Epoch 00076: val_loss did not improve from 0.14007
Epoch 77/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0016 - accuracy: 1.0000 - val_loss: 0.3259 - val_accuracy: 0.9861

Epoch 00077: val_loss did not improve from 0.14007
Epoch 78/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0183 - accuracy: 0.9940 - val_loss: 0.3303 - val_accuracy: 0.9861

Epoch 00078: val_loss did not improve from 0.14007
Epoch 79/400
6/6 [==============================] - 0s 15ms/step - loss: 4.8469e-04 - accuracy: 1.0000 - val_loss: 0.3322 - val_accuracy: 0.9861

Epoch 00079: val_loss did not improve from 0.14007
Epoch 80/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0011 - accuracy: 1.0000 - val_loss: 0.3318 - val_accuracy: 0.9861

Epoch 00080: val_loss did not improve from 0.14007
Epoch 81/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0284 - accuracy: 0.9881 - val_loss: 0.3378 - val_accuracy: 0.9861

Epoch 00081: val_loss did not improve from 0.14007
Epoch 82/400
6/6 [==============================] - 0s 13ms/step - loss: 2.7658e-04 - accuracy: 1.0000 - val_loss: 0.3395 - val_accuracy: 0.9861

Epoch 00082: val_loss did not improve from 0.14007
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Epoch 83/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0021 - accuracy: 1.0000 - val_loss: 0.3341 - val_accuracy: 0.9861

Epoch 00083: val_loss did not improve from 0.14007
Epoch 84/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0519 - accuracy: 0.9940 - val_loss: 0.3361 - val_accuracy: 0.9861

Epoch 00084: val_loss did not improve from 0.14007
Epoch 85/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0350 - accuracy: 0.9881 - val_loss: 0.3382 - val_accuracy: 0.9722

Epoch 00085: val_loss did not improve from 0.14007
Epoch 86/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0039 - accuracy: 1.0000 - val_loss: 0.3847 - val_accuracy: 0.9722

Epoch 00086: val_loss did not improve from 0.14007
Epoch 87/400
6/6 [==============================] - 0s 13ms/step - loss: 0.1290 - accuracy: 0.9762 - val_loss: 0.3584 - val_accuracy: 0.9722

Epoch 00087: val_loss did not improve from 0.14007
Epoch 88/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0115 - accuracy: 0.9940 - val_loss: 0.3491 - val_accuracy: 0.9861

Epoch 00088: val_loss did not improve from 0.14007
Epoch 89/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0060 - accuracy: 0.9940 - val_loss: 0.3496 - val_accuracy: 0.9861

Epoch 00089: val_loss did not improve from 0.14007
Epoch 90/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0042 - accuracy: 1.0000 - val_loss: 0.3547 - val_accuracy: 0.9861

Epoch 00090: val_loss did not improve from 0.14007
Epoch 91/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0027 - accuracy: 1.0000 - val_loss: 0.3604 - val_accuracy: 0.9861

Epoch 00091: val_loss did not improve from 0.14007
Epoch 92/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0323 - accuracy: 0.9940 - val_loss: 0.3630 - val_accuracy: 0.9861

Epoch 00092: val_loss did not improve from 0.14007
Epoch 93/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0017 - accuracy: 1.0000 - val_loss: 0.3604 - val_accuracy: 0.9861

Epoch 00093: val_loss did not improve from 0.14007
Epoch 94/400
6/6 [==============================] - 0s 13ms/step - loss: 9.0222e-04 - accuracy: 1.0000 - val_loss: 0.3591 - val_accuracy: 0.9861

Epoch 00094: val_loss did not improve from 0.14007
Epoch 95/400
6/6 [==============================] - 0s 13ms/step - loss: 7.7144e-04 - accuracy: 1.0000 - val_loss: 0.3587 - val_accuracy: 0.9861

Epoch 00095: val_loss did not improve from 0.14007
Epoch 96/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0046 - accuracy: 1.0000 - val_loss: 0.3574 - val_accuracy: 0.9861

Epoch 00096: val_loss did not improve from 0.14007
Epoch 97/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0167 - accuracy: 0.9940 - val_loss: 0.3535 - val_accuracy: 0.9861

Epoch 00097: val_loss did not improve from 0.14007
Epoch 98/400
6/6 [==============================] - 0s 13ms/step - loss: 7.4999e-04 - accuracy: 1.0000 - val_loss: 0.3571 - val_accuracy: 0.9861

Epoch 00098: val_loss did not improve from 0.14007
Epoch 99/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0017 - accuracy: 1.0000 - val_loss: 0.3600 - val_accuracy: 0.9861

Epoch 00099: val_loss did not improve from 0.14007
Epoch 100/400
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6/6 [==============================] - 0s 13ms/step - loss: 0.0088 - accuracy: 1.0000 - val_loss: 0.3545 - val_accuracy: 0.9861

Epoch 00100: val_loss did not improve from 0.14007
Epoch 101/400
6/6 [==============================] - 0s 14ms/step - loss: 5.8684e-04 - accuracy: 1.0000 - val_loss: 0.3513 - val_accuracy: 0.9861

Epoch 00101: val_loss did not improve from 0.14007
Epoch 102/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0012 - accuracy: 1.0000 - val_loss: 0.3489 - val_accuracy: 0.9861

Epoch 00102: val_loss did not improve from 0.14007
Epoch 103/400
6/6 [==============================] - 0s 13ms/step - loss: 2.0599e-04 - accuracy: 1.0000 - val_loss: 0.3469 - val_accuracy: 0.9861

Epoch 00103: val_loss did not improve from 0.14007
Epoch 104/400
6/6 [==============================] - 0s 13ms/step - loss: 2.9374e-04 - accuracy: 1.0000 - val_loss: 0.3459 - val_accuracy: 0.9861

Epoch 00104: val_loss did not improve from 0.14007
Epoch 105/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0183 - accuracy: 0.9940 - val_loss: 0.3415 - val_accuracy: 0.9861

Epoch 00105: val_loss did not improve from 0.14007
Epoch 106/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0033 - accuracy: 1.0000 - val_loss: 0.3359 - val_accuracy: 0.9861

Epoch 00106: val_loss did not improve from 0.14007
Epoch 107/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0105 - accuracy: 0.9940 - val_loss: 0.3336 - val_accuracy: 0.9861

Epoch 00107: val_loss did not improve from 0.14007
Epoch 108/400
6/6 [==============================] - 0s 13ms/step - loss: 2.8136e-04 - accuracy: 1.0000 - val_loss: 0.3324 - val_accuracy: 0.9861

Epoch 00108: val_loss did not improve from 0.14007
Epoch 109/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0042 - accuracy: 1.0000 - val_loss: 0.3331 - val_accuracy: 0.9861

Epoch 00109: val_loss did not improve from 0.14007
Epoch 110/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0183 - accuracy: 0.9940 - val_loss: 0.3465 - val_accuracy: 0.9861

Epoch 00110: val_loss did not improve from 0.14007
Epoch 111/400
6/6 [==============================] - 0s 14ms/step - loss: 5.5533e-05 - accuracy: 1.0000 - val_loss: 0.3478 - val_accuracy: 0.9861

Epoch 00111: val_loss did not improve from 0.14007
Epoch 112/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0044 - accuracy: 1.0000 - val_loss: 0.3446 - val_accuracy: 0.9861

Epoch 00112: val_loss did not improve from 0.14007
Epoch 113/400
6/6 [==============================] - 0s 17ms/step - loss: 1.3982e-04 - accuracy: 1.0000 - val_loss: 0.3428 - val_accuracy: 0.9861

Epoch 00113: val_loss did not improve from 0.14007
Epoch 114/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0020 - accuracy: 1.0000 - val_loss: 0.3419 - val_accuracy: 0.9861

Epoch 00114: val_loss did not improve from 0.14007
Epoch 115/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0054 - accuracy: 1.0000 - val_loss: 0.3422 - val_accuracy: 0.9861

Epoch 00115: val_loss did not improve from 0.14007
Epoch 116/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0057 - accuracy: 0.9940 - val_loss: 0.3478 - val_accuracy: 0.9861

Epoch 00116: val_loss did not improve from 0.14007
Epoch 117/400
6/6 [==============================] - 0s 14ms/step - loss: 1.4095e-04 - accuracy: 1.0000 - val_loss: 0.3438 - val_accuracy: 0.9861
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Epoch 00117: val_loss did not improve from 0.14007
Epoch 118/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0100 - accuracy: 0.9940 - val_loss: 0.3482 - val_accuracy: 0.9861

Epoch 00118: val_loss did not improve from 0.14007
Epoch 119/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0021 - accuracy: 1.0000 - val_loss: 0.3527 - val_accuracy: 0.9861

Epoch 00119: val_loss did not improve from 0.14007
Epoch 120/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0025 - accuracy: 1.0000 - val_loss: 0.3389 - val_accuracy: 0.9861

Epoch 00120: val_loss did not improve from 0.14007
Epoch 121/400
6/6 [==============================] - 0s 13ms/step - loss: 4.3831e-04 - accuracy: 1.0000 - val_loss: 0.3114 - val_accuracy: 0.9861

Epoch 00121: val_loss did not improve from 0.14007
Epoch 122/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0328 - accuracy: 0.9940 - val_loss: 0.3124 - val_accuracy: 0.9861

Epoch 00122: val_loss did not improve from 0.14007
Epoch 123/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0132 - accuracy: 0.9881 - val_loss: 0.3646 - val_accuracy: 0.9861

Epoch 00123: val_loss did not improve from 0.14007
Epoch 124/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0063 - accuracy: 0.9940 - val_loss: 0.3936 - val_accuracy: 0.9861

Epoch 00124: val_loss did not improve from 0.14007
Epoch 125/400
6/6 [==============================] - 0s 14ms/step - loss: 8.4072e-04 - accuracy: 1.0000 - val_loss: 0.4033 - val_accuracy: 0.9861

Epoch 00125: val_loss did not improve from 0.14007
Epoch 126/400
6/6 [==============================] - 0s 13ms/step - loss: 1.0388e-04 - accuracy: 1.0000 - val_loss: 0.4091 - val_accuracy: 0.9861

Epoch 00126: val_loss did not improve from 0.14007
Epoch 127/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0235 - accuracy: 0.9940 - val_loss: 0.4107 - val_accuracy: 0.9861

Epoch 00127: val_loss did not improve from 0.14007
Epoch 128/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0040 - accuracy: 1.0000 - val_loss: 0.4077 - val_accuracy: 0.9861

Epoch 00128: val_loss did not improve from 0.14007
Epoch 129/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0217 - accuracy: 0.9940 - val_loss: 0.4141 - val_accuracy: 0.9861

Epoch 00129: val_loss did not improve from 0.14007
Epoch 130/400
6/6 [==============================] - 0s 13ms/step - loss: 4.6973e-04 - accuracy: 1.0000 - val_loss: 0.4119 - val_accuracy: 0.9861

Epoch 00130: val_loss did not improve from 0.14007
Epoch 131/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0603 - accuracy: 0.9940 - val_loss: 0.4043 - val_accuracy: 0.9861

Epoch 00131: val_loss did not improve from 0.14007
Epoch 132/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0020 - accuracy: 1.0000 - val_loss: 0.4019 - val_accuracy: 0.9861

Epoch 00132: val_loss did not improve from 0.14007
Epoch 133/400
6/6 [==============================] - 0s 14ms/step - loss: 1.5758e-04 - accuracy: 1.0000 - val_loss: 0.4003 - val_accuracy: 0.9861

Epoch 00133: val_loss did not improve from 0.14007
Epoch 134/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0594 - accuracy: 0.9940 - val_loss: 0.4402 - val_accuracy: 0.9722
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Epoch 00134: val_loss did not improve from 0.14007
Epoch 135/400
6/6 [==============================] - 0s 14ms/step - loss: 6.7699e-04 - accuracy: 1.0000 - val_loss: 0.5249 - val_accuracy: 0.9722

Epoch 00135: val_loss did not improve from 0.14007
Epoch 136/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0174 - accuracy: 0.9940 - val_loss: 0.4951 - val_accuracy: 0.9722

Epoch 00136: val_loss did not improve from 0.14007
Epoch 137/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0179 - accuracy: 0.9940 - val_loss: 0.4702 - val_accuracy: 0.9722

Epoch 00137: val_loss did not improve from 0.14007
Epoch 138/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0195 - accuracy: 0.9940 - val_loss: 0.4842 - val_accuracy: 0.9722

Epoch 00138: val_loss did not improve from 0.14007
Epoch 139/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0051 - accuracy: 1.0000 - val_loss: 0.4981 - val_accuracy: 0.9722

Epoch 00139: val_loss did not improve from 0.14007
Epoch 140/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0171 - accuracy: 0.9940 - val_loss: 0.5157 - val_accuracy: 0.9722

Epoch 00140: val_loss did not improve from 0.14007
Epoch 141/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0014 - accuracy: 1.0000 - val_loss: 0.5270 - val_accuracy: 0.9861

Epoch 00141: val_loss did not improve from 0.14007
Epoch 142/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0060 - accuracy: 1.0000 - val_loss: 0.5350 - val_accuracy: 0.9861

Epoch 00142: val_loss did not improve from 0.14007
Epoch 143/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0025 - accuracy: 1.0000 - val_loss: 0.5378 - val_accuracy: 0.9861

Epoch 00143: val_loss did not improve from 0.14007
Epoch 144/400
6/6 [==============================] - 0s 18ms/step - loss: 0.0049 - accuracy: 1.0000 - val_loss: 0.5436 - val_accuracy: 0.9861

Epoch 00144: val_loss did not improve from 0.14007
Epoch 145/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0025 - accuracy: 1.0000 - val_loss: 0.5392 - val_accuracy: 0.9861

Epoch 00145: val_loss did not improve from 0.14007
Epoch 146/400
6/6 [==============================] - 0s 15ms/step - loss: 8.5335e-05 - accuracy: 1.0000 - val_loss: 0.5251 - val_accuracy: 0.9861

Epoch 00146: val_loss did not improve from 0.14007
Epoch 147/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0015 - accuracy: 1.0000 - val_loss: 0.5166 - val_accuracy: 0.9861

Epoch 00147: val_loss did not improve from 0.14007
Epoch 148/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0018 - accuracy: 1.0000 - val_loss: 0.5101 - val_accuracy: 0.9861

Epoch 00148: val_loss did not improve from 0.14007
Epoch 149/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0013 - accuracy: 1.0000 - val_loss: 0.5043 - val_accuracy: 0.9861

Epoch 00149: val_loss did not improve from 0.14007
Epoch 150/400
6/6 [==============================] - 0s 15ms/step - loss: 6.5518e-04 - accuracy: 1.0000 - val_loss: 0.5001 - val_accuracy: 0.9861

Epoch 00150: val_loss did not improve from 0.14007
Epoch 151/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0031 - accuracy: 1.0000 - val_loss: 0.4960 - val_accuracy: 0.9861

Epoch 00151: val_loss did not improve from 0.14007
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Epoch 152/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0419 - accuracy: 0.9940 - val_loss: 0.5050 - val_accuracy: 0.9861

Epoch 00152: val_loss did not improve from 0.14007
Epoch 153/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0032 - accuracy: 1.0000 - val_loss: 0.5288 - val_accuracy: 0.9861

Epoch 00153: val_loss did not improve from 0.14007
Epoch 154/400
6/6 [==============================] - 0s 13ms/step - loss: 1.5646e-04 - accuracy: 1.0000 - val_loss: 0.5413 - val_accuracy: 0.9861

Epoch 00154: val_loss did not improve from 0.14007
Epoch 155/400
6/6 [==============================] - 0s 15ms/step - loss: 0.1699 - accuracy: 0.9881 - val_loss: 0.5349 - val_accuracy: 0.9861

Epoch 00155: val_loss did not improve from 0.14007
Epoch 156/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0167 - accuracy: 0.9940 - val_loss: 0.5287 - val_accuracy: 0.9861

Epoch 00156: val_loss did not improve from 0.14007
Epoch 157/400
6/6 [==============================] - 0s 14ms/step - loss: 0.2222 - accuracy: 0.9821 - val_loss: 0.4810 - val_accuracy: 0.9861

Epoch 00157: val_loss did not improve from 0.14007
Epoch 158/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0463 - accuracy: 0.9881 - val_loss: 0.4690 - val_accuracy: 0.9861

Epoch 00158: val_loss did not improve from 0.14007
Epoch 159/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0138 - accuracy: 0.9940 - val_loss: 0.4567 - val_accuracy: 0.9861

Epoch 00159: val_loss did not improve from 0.14007
Epoch 160/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0085 - accuracy: 0.9940 - val_loss: 0.4446 - val_accuracy: 0.9861

Epoch 00160: val_loss did not improve from 0.14007
Epoch 161/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0066 - accuracy: 0.9940 - val_loss: 0.4360 - val_accuracy: 0.9861

Epoch 00161: val_loss did not improve from 0.14007
Epoch 162/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0683 - accuracy: 0.9940 - val_loss: 0.4475 - val_accuracy: 0.9861

Epoch 00162: val_loss did not improve from 0.14007
Epoch 163/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0031 - accuracy: 1.0000 - val_loss: 0.4444 - val_accuracy: 0.9861

Epoch 00163: val_loss did not improve from 0.14007
Epoch 164/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0091 - accuracy: 1.0000 - val_loss: 0.4446 - val_accuracy: 0.9861

Epoch 00164: val_loss did not improve from 0.14007
Epoch 165/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0066 - accuracy: 0.9940 - val_loss: 0.4619 - val_accuracy: 0.9861

Epoch 00165: val_loss did not improve from 0.14007
Epoch 166/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0082 - accuracy: 0.9940 - val_loss: 0.4750 - val_accuracy: 0.9861

Epoch 00166: val_loss did not improve from 0.14007
Epoch 167/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0050 - accuracy: 1.0000 - val_loss: 0.4843 - val_accuracy: 0.9861

Epoch 00167: val_loss did not improve from 0.14007
Epoch 168/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0133 - accuracy: 0.9940 - val_loss: 0.4973 - val_accuracy: 0.9861

Epoch 00168: val_loss did not improve from 0.14007
Epoch 169/400
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6/6 [==============================] - 0s 16ms/step - loss: 1.2782e-04 - accuracy: 1.0000 - val_loss: 0.5002 - val_accuracy: 0.9861

Epoch 00169: val_loss did not improve from 0.14007
Epoch 170/400
6/6 [==============================] - 0s 14ms/step - loss: 5.0258e-04 - accuracy: 1.0000 - val_loss: 0.5009 - val_accuracy: 0.9861

Epoch 00170: val_loss did not improve from 0.14007
Epoch 171/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0011 - accuracy: 1.0000 - val_loss: 0.5020 - val_accuracy: 0.9861

Epoch 00171: val_loss did not improve from 0.14007
Epoch 172/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0104 - accuracy: 0.9940 - val_loss: 0.4950 - val_accuracy: 0.9861

Epoch 00172: val_loss did not improve from 0.14007
Epoch 173/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0012 - accuracy: 1.0000 - val_loss: 0.4855 - val_accuracy: 0.9861

Epoch 00173: val_loss did not improve from 0.14007
Epoch 174/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0016 - accuracy: 1.0000 - val_loss: 0.4796 - val_accuracy: 0.9861

Epoch 00174: val_loss did not improve from 0.14007
Epoch 175/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0060 - accuracy: 0.9940 - val_loss: 0.4742 - val_accuracy: 0.9861

Epoch 00175: val_loss did not improve from 0.14007
Epoch 176/400
6/6 [==============================] - 0s 14ms/step - loss: 5.6249e-04 - accuracy: 1.0000 - val_loss: 0.4732 - val_accuracy: 0.9861

Epoch 00176: val_loss did not improve from 0.14007
Epoch 177/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0147 - accuracy: 0.9940 - val_loss: 0.4719 - val_accuracy: 0.9861

Epoch 00177: val_loss did not improve from 0.14007
Epoch 178/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0139 - accuracy: 0.9940 - val_loss: 0.4548 - val_accuracy: 0.9861

Epoch 00178: val_loss did not improve from 0.14007
Epoch 179/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0013 - accuracy: 1.0000 - val_loss: 0.4478 - val_accuracy: 0.9861

Epoch 00179: val_loss did not improve from 0.14007
Epoch 180/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0036 - accuracy: 1.0000 - val_loss: 0.4256 - val_accuracy: 0.9861

Epoch 00180: val_loss did not improve from 0.14007
Epoch 181/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0017 - accuracy: 1.0000 - val_loss: 0.4063 - val_accuracy: 0.9861

Epoch 00181: val_loss did not improve from 0.14007
Epoch 182/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0195 - accuracy: 0.9940 - val_loss: 0.4351 - val_accuracy: 0.9861

Epoch 00182: val_loss did not improve from 0.14007
Epoch 183/400
6/6 [==============================] - 0s 14ms/step - loss: 0.1515 - accuracy: 0.9881 - val_loss: 0.5202 - val_accuracy: 0.9722

Epoch 00183: val_loss did not improve from 0.14007
Epoch 184/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0068 - accuracy: 0.9940 - val_loss: 0.5918 - val_accuracy: 0.9722

Epoch 00184: val_loss did not improve from 0.14007
Epoch 185/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0085 - accuracy: 0.9940 - val_loss: 0.5912 - val_accuracy: 0.9722

Epoch 00185: val_loss did not improve from 0.14007
Epoch 186/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0450 - accuracy: 0.9940 - val_loss: 0.5682 - val_accuracy: 0.9722
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Epoch 00186: val_loss did not improve from 0.14007
Epoch 187/400
6/6 [==============================] - 0s 14ms/step - loss: 4.0059e-04 - accuracy: 1.0000 - val_loss: 0.5401 - val_accuracy: 0.9722

Epoch 00187: val_loss did not improve from 0.14007
Epoch 188/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0060 - accuracy: 1.0000 - val_loss: 0.5246 - val_accuracy: 0.9722

Epoch 00188: val_loss did not improve from 0.14007
Epoch 189/400
6/6 [==============================] - 0s 16ms/step - loss: 2.8769e-05 - accuracy: 1.0000 - val_loss: 0.5183 - val_accuracy: 0.9722

Epoch 00189: val_loss did not improve from 0.14007
Epoch 190/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0040 - accuracy: 1.0000 - val_loss: 0.4930 - val_accuracy: 0.9861

Epoch 00190: val_loss did not improve from 0.14007
Epoch 191/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0115 - accuracy: 0.9940 - val_loss: 0.4798 - val_accuracy: 0.9861

Epoch 00191: val_loss did not improve from 0.14007
Epoch 192/400
6/6 [==============================] - 0s 15ms/step - loss: 3.5855e-05 - accuracy: 1.0000 - val_loss: 0.4749 - val_accuracy: 0.9861

Epoch 00192: val_loss did not improve from 0.14007
Epoch 193/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0012 - accuracy: 1.0000 - val_loss: 0.4725 - val_accuracy: 0.9861

Epoch 00193: val_loss did not improve from 0.14007
Epoch 194/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0055 - accuracy: 1.0000 - val_loss: 0.4677 - val_accuracy: 0.9861

Epoch 00194: val_loss did not improve from 0.14007
Epoch 195/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0061 - accuracy: 1.0000 - val_loss: 0.4521 - val_accuracy: 0.9861

Epoch 00195: val_loss did not improve from 0.14007
Epoch 196/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0199 - accuracy: 0.9940 - val_loss: 0.4555 - val_accuracy: 0.9861

Epoch 00196: val_loss did not improve from 0.14007
Epoch 197/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0122 - accuracy: 0.9940 - val_loss: 0.4627 - val_accuracy: 0.9861

Epoch 00197: val_loss did not improve from 0.14007
Epoch 198/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0062 - accuracy: 0.9940 - val_loss: 0.4679 - val_accuracy: 0.9861

Epoch 00198: val_loss did not improve from 0.14007
Epoch 199/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0036 - accuracy: 1.0000 - val_loss: 0.4774 - val_accuracy: 0.9861

Epoch 00199: val_loss did not improve from 0.14007
Epoch 200/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0454 - accuracy: 0.9881 - val_loss: 0.4702 - val_accuracy: 0.9861

Epoch 00200: val_loss did not improve from 0.14007
Epoch 201/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0011 - accuracy: 1.0000 - val_loss: 0.4453 - val_accuracy: 0.9861

Epoch 00201: val_loss did not improve from 0.14007
Epoch 202/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0060 - accuracy: 1.0000 - val_loss: 0.4187 - val_accuracy: 0.9861

Epoch 00202: val_loss did not improve from 0.14007
Epoch 203/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0066 - accuracy: 0.9940 - val_loss: 0.4111 - val_accuracy: 0.9861
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Epoch 00203: val_loss did not improve from 0.14007
Epoch 204/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0281 - accuracy: 0.9940 - val_loss: 0.4277 - val_accuracy: 0.9861

Epoch 00204: val_loss did not improve from 0.14007
Epoch 205/400
6/6 [==============================] - 0s 14ms/step - loss: 5.6413e-04 - accuracy: 1.0000 - val_loss: 0.4683 - val_accuracy: 0.9861

Epoch 00205: val_loss did not improve from 0.14007
Epoch 206/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0859 - accuracy: 0.9881 - val_loss: 0.5262 - val_accuracy: 0.9861

Epoch 00206: val_loss did not improve from 0.14007
Epoch 207/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0182 - accuracy: 0.9940 - val_loss: 0.5647 - val_accuracy: 0.9861

Epoch 00207: val_loss did not improve from 0.14007
Epoch 208/400
6/6 [==============================] - 0s 14ms/step - loss: 8.9997e-04 - accuracy: 1.0000 - val_loss: 0.5832 - val_accuracy: 0.9861

Epoch 00208: val_loss did not improve from 0.14007
Epoch 209/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0030 - accuracy: 1.0000 - val_loss: 0.5888 - val_accuracy: 0.9861

Epoch 00209: val_loss did not improve from 0.14007
Epoch 210/400
6/6 [==============================] - 0s 17ms/step - loss: 6.0573e-04 - accuracy: 1.0000 - val_loss: 0.5981 - val_accuracy: 0.9861

Epoch 00210: val_loss did not improve from 0.14007
Epoch 211/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0157 - accuracy: 0.9940 - val_loss: 0.6008 - val_accuracy: 0.9861

Epoch 00211: val_loss did not improve from 0.14007
Epoch 212/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0074 - accuracy: 0.9940 - val_loss: 0.5930 - val_accuracy: 0.9861

Epoch 00212: val_loss did not improve from 0.14007
Epoch 213/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0186 - accuracy: 0.9881 - val_loss: 0.5348 - val_accuracy: 0.9861

Epoch 00213: val_loss did not improve from 0.14007
Epoch 214/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0082 - accuracy: 1.0000 - val_loss: 0.4735 - val_accuracy: 0.9861

Epoch 00214: val_loss did not improve from 0.14007
Epoch 215/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0016 - accuracy: 1.0000 - val_loss: 0.4594 - val_accuracy: 0.9861

Epoch 00215: val_loss did not improve from 0.14007
Epoch 216/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0669 - accuracy: 0.9762 - val_loss: 0.4481 - val_accuracy: 0.9861

Epoch 00216: val_loss did not improve from 0.14007
Epoch 217/400
6/6 [==============================] - 0s 15ms/step - loss: 6.6057e-04 - accuracy: 1.0000 - val_loss: 0.4172 - val_accuracy: 0.9861

Epoch 00217: val_loss did not improve from 0.14007
Epoch 218/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0073 - accuracy: 1.0000 - val_loss: 0.3920 - val_accuracy: 0.9861

Epoch 00218: val_loss did not improve from 0.14007
Epoch 219/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0778 - accuracy: 0.9821 - val_loss: 0.4011 - val_accuracy: 0.9861

Epoch 00219: val_loss did not improve from 0.14007
Epoch 220/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0011 - accuracy: 1.0000 - val_loss: 0.3996 - val_accuracy: 0.9861

Epoch 00220: val_loss did not improve from 0.14007
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Epoch 221/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0014 - accuracy: 1.0000 - val_loss: 0.3994 - val_accuracy: 0.9861

Epoch 00221: val_loss did not improve from 0.14007
Epoch 222/400
6/6 [==============================] - 0s 13ms/step - loss: 2.7510e-04 - accuracy: 1.0000 - val_loss: 0.3997 - val_accuracy: 0.9861

Epoch 00222: val_loss did not improve from 0.14007
Epoch 223/400
6/6 [==============================] - 0s 13ms/step - loss: 7.8380e-04 - accuracy: 1.0000 - val_loss: 0.3989 - val_accuracy: 0.9861

Epoch 00223: val_loss did not improve from 0.14007
Epoch 224/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0092 - accuracy: 0.9940 - val_loss: 0.3976 - val_accuracy: 0.9861

Epoch 00224: val_loss did not improve from 0.14007
Epoch 225/400
6/6 [==============================] - 0s 15ms/step - loss: 3.5030e-05 - accuracy: 1.0000 - val_loss: 0.3975 - val_accuracy: 0.9861

Epoch 00225: val_loss did not improve from 0.14007
Epoch 226/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0054 - accuracy: 0.9940 - val_loss: 0.3939 - val_accuracy: 0.9861

Epoch 00226: val_loss did not improve from 0.14007
Epoch 227/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0730 - accuracy: 0.9940 - val_loss: 0.4235 - val_accuracy: 0.9722

Epoch 00227: val_loss did not improve from 0.14007
Epoch 228/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0225 - accuracy: 0.9881 - val_loss: 0.4825 - val_accuracy: 0.9722

Epoch 00228: val_loss did not improve from 0.14007
Epoch 229/400
6/6 [==============================] - 0s 14ms/step - loss: 3.5728e-04 - accuracy: 1.0000 - val_loss: 0.5076 - val_accuracy: 0.9722

Epoch 00229: val_loss did not improve from 0.14007
Epoch 230/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0234 - accuracy: 0.9940 - val_loss: 0.4949 - val_accuracy: 0.9722

Epoch 00230: val_loss did not improve from 0.14007
Epoch 231/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0265 - accuracy: 0.9940 - val_loss: 0.4617 - val_accuracy: 0.9861

Epoch 00231: val_loss did not improve from 0.14007
Epoch 232/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0355 - accuracy: 0.9940 - val_loss: 0.4432 - val_accuracy: 0.9861

Epoch 00232: val_loss did not improve from 0.14007
Epoch 233/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0267 - accuracy: 0.9940 - val_loss: 0.4414 - val_accuracy: 0.9861

Epoch 00233: val_loss did not improve from 0.14007
Epoch 234/400
6/6 [==============================] - 0s 16ms/step - loss: 0.1046 - accuracy: 0.9881 - val_loss: 0.4622 - val_accuracy: 0.9861

Epoch 00234: val_loss did not improve from 0.14007
Epoch 235/400
6/6 [==============================] - 0s 14ms/step - loss: 0.1493 - accuracy: 0.9881 - val_loss: 0.5551 - val_accuracy: 0.9722

Epoch 00235: val_loss did not improve from 0.14007
Epoch 236/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0095 - accuracy: 0.9940 - val_loss: 0.5445 - val_accuracy: 0.9722

Epoch 00236: val_loss did not improve from 0.14007
Epoch 237/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0521 - accuracy: 0.9821 - val_loss: 0.4869 - val_accuracy: 0.9861

Epoch 00237: val_loss did not improve from 0.14007
Epoch 238/400
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6/6 [==============================] - 0s 13ms/step - loss: 0.0178 - accuracy: 0.9940 - val_loss: 0.4677 - val_accuracy: 0.9861

Epoch 00238: val_loss did not improve from 0.14007
Epoch 239/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0049 - accuracy: 1.0000 - val_loss: 0.4633 - val_accuracy: 0.9861

Epoch 00239: val_loss did not improve from 0.14007
Epoch 240/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0540 - accuracy: 0.9940 - val_loss: 0.4593 - val_accuracy: 0.9861

Epoch 00240: val_loss did not improve from 0.14007
Epoch 241/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0478 - accuracy: 0.9821 - val_loss: 0.4261 - val_accuracy: 0.9861

Epoch 00241: val_loss did not improve from 0.14007
Epoch 242/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0026 - accuracy: 1.0000 - val_loss: 0.4000 - val_accuracy: 0.9861

Epoch 00242: val_loss did not improve from 0.14007
Epoch 243/400
6/6 [==============================] - 0s 14ms/step - loss: 8.9707e-04 - accuracy: 1.0000 - val_loss: 0.3839 - val_accuracy: 0.9861

Epoch 00243: val_loss did not improve from 0.14007
Epoch 244/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0033 - accuracy: 1.0000 - val_loss: 0.3720 - val_accuracy: 0.9861

Epoch 00244: val_loss did not improve from 0.14007
Epoch 245/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0813 - accuracy: 0.9881 - val_loss: 0.3585 - val_accuracy: 0.9861

Epoch 00245: val_loss did not improve from 0.14007
Epoch 246/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0204 - accuracy: 0.9881 - val_loss: 0.3271 - val_accuracy: 0.9861

Epoch 00246: val_loss did not improve from 0.14007
Epoch 247/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0014 - accuracy: 1.0000 - val_loss: 0.3076 - val_accuracy: 0.9861

Epoch 00247: val_loss did not improve from 0.14007
Epoch 248/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0647 - accuracy: 0.9762 - val_loss: 0.3888 - val_accuracy: 0.9861

Epoch 00248: val_loss did not improve from 0.14007
Epoch 249/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0161 - accuracy: 0.9940 - val_loss: 0.5489 - val_accuracy: 0.9861

Epoch 00249: val_loss did not improve from 0.14007
Epoch 250/400
6/6 [==============================] - 0s 10ms/step - loss: 0.0150 - accuracy: 0.9940 - val_loss: 0.6550 - val_accuracy: 0.9861

Epoch 00250: val_loss did not improve from 0.14007
Epoch 251/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0017 - accuracy: 1.0000 - val_loss: 0.7139 - val_accuracy: 0.9861

Epoch 00251: val_loss did not improve from 0.14007
Epoch 252/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0104 - accuracy: 0.9940 - val_loss: 0.7449 - val_accuracy: 0.9861

Epoch 00252: val_loss did not improve from 0.14007
Epoch 253/400
6/6 [==============================] - 0s 14ms/step - loss: 0.1041 - accuracy: 0.9881 - val_loss: 0.7212 - val_accuracy: 0.9861

Epoch 00253: val_loss did not improve from 0.14007
Epoch 254/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0297 - accuracy: 0.9881 - val_loss: 0.7443 - val_accuracy: 0.9722

Epoch 00254: val_loss did not improve from 0.14007
Epoch 255/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0597 - accuracy: 0.9940 - val_loss: 0.8094 - val_accuracy: 0.9722
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Epoch 00255: val_loss did not improve from 0.14007
Epoch 256/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0099 - accuracy: 1.0000 - val_loss: 0.7480 - val_accuracy: 0.9722

Epoch 00256: val_loss did not improve from 0.14007
Epoch 257/400
6/6 [==============================] - 0s 19ms/step - loss: 7.1677e-04 - accuracy: 1.0000 - val_loss: 0.7232 - val_accuracy: 0.9722

Epoch 00257: val_loss did not improve from 0.14007
Epoch 258/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0031 - accuracy: 1.0000 - val_loss: 0.7277 - val_accuracy: 0.9722

Epoch 00258: val_loss did not improve from 0.14007
Epoch 259/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0282 - accuracy: 0.9881 - val_loss: 0.7338 - val_accuracy: 0.9722

Epoch 00259: val_loss did not improve from 0.14007
Epoch 260/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0080 - accuracy: 0.9940 - val_loss: 0.6667 - val_accuracy: 0.9861

Epoch 00260: val_loss did not improve from 0.14007
Epoch 261/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0201 - accuracy: 0.9940 - val_loss: 0.6470 - val_accuracy: 0.9861

Epoch 00261: val_loss did not improve from 0.14007
Epoch 262/400
6/6 [==============================] - 0s 17ms/step - loss: 4.4976e-04 - accuracy: 1.0000 - val_loss: 0.6366 - val_accuracy: 0.9861

Epoch 00262: val_loss did not improve from 0.14007
Epoch 263/400
6/6 [==============================] - 0s 18ms/step - loss: 0.0072 - accuracy: 1.0000 - val_loss: 0.6294 - val_accuracy: 0.9861

Epoch 00263: val_loss did not improve from 0.14007
Epoch 264/400
6/6 [==============================] - 0s 14ms/step - loss: 1.9098e-05 - accuracy: 1.0000 - val_loss: 0.6225 - val_accuracy: 0.9861

Epoch 00264: val_loss did not improve from 0.14007
Epoch 265/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0095 - accuracy: 1.0000 - val_loss: 0.6235 - val_accuracy: 0.9861

Epoch 00265: val_loss did not improve from 0.14007
Epoch 266/400
6/6 [==============================] - 0s 14ms/step - loss: 5.3778e-04 - accuracy: 1.0000 - val_loss: 0.6252 - val_accuracy: 0.9861

Epoch 00266: val_loss did not improve from 0.14007
Epoch 267/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0361 - accuracy: 0.9881 - val_loss: 0.6231 - val_accuracy: 0.9861

Epoch 00267: val_loss did not improve from 0.14007
Epoch 268/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0434 - accuracy: 0.9940 - val_loss: 0.6074 - val_accuracy: 0.9861

Epoch 00268: val_loss did not improve from 0.14007
Epoch 269/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0671 - accuracy: 0.9881 - val_loss: 0.5781 - val_accuracy: 0.9861

Epoch 00269: val_loss did not improve from 0.14007
Epoch 270/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0139 - accuracy: 0.9940 - val_loss: 0.5759 - val_accuracy: 0.9861

Epoch 00270: val_loss did not improve from 0.14007
Epoch 271/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0200 - accuracy: 0.9881 - val_loss: 0.5952 - val_accuracy: 0.9861

Epoch 00271: val_loss did not improve from 0.14007
Epoch 272/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0422 - accuracy: 0.9940 - val_loss: 0.4566 - val_accuracy: 0.9861
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Epoch 00272: val_loss did not improve from 0.14007
Epoch 273/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0310 - accuracy: 0.9940 - val_loss: 0.4021 - val_accuracy: 0.9861

Epoch 00273: val_loss did not improve from 0.14007
Epoch 274/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0015 - accuracy: 1.0000 - val_loss: 0.3626 - val_accuracy: 0.9861

Epoch 00274: val_loss did not improve from 0.14007
Epoch 275/400
6/6 [==============================] - 0s 11ms/step - loss: 0.0913 - accuracy: 0.9821 - val_loss: 0.3352 - val_accuracy: 0.9861

Epoch 00275: val_loss did not improve from 0.14007
Epoch 276/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0358 - accuracy: 0.9940 - val_loss: 0.3363 - val_accuracy: 0.9861

Epoch 00276: val_loss did not improve from 0.14007
Epoch 277/400
6/6 [==============================] - 0s 13ms/step - loss: 0.1277 - accuracy: 0.9881 - val_loss: 0.3327 - val_accuracy: 0.9861

Epoch 00277: val_loss did not improve from 0.14007
Epoch 278/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0018 - accuracy: 1.0000 - val_loss: 0.3497 - val_accuracy: 0.9861

Epoch 00278: val_loss did not improve from 0.14007
Epoch 279/400
6/6 [==============================] - 0s 17ms/step - loss: 0.2223 - accuracy: 0.9762 - val_loss: 0.3561 - val_accuracy: 0.9861

Epoch 00279: val_loss did not improve from 0.14007
Epoch 280/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0652 - accuracy: 0.9940 - val_loss: 0.3637 - val_accuracy: 0.9861

Epoch 00280: val_loss did not improve from 0.14007
Epoch 281/400
6/6 [==============================] - 0s 13ms/step - loss: 0.1162 - accuracy: 0.9821 - val_loss: 0.3619 - val_accuracy: 0.9861

Epoch 00281: val_loss did not improve from 0.14007
Epoch 282/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0317 - accuracy: 0.9881 - val_loss: 0.3513 - val_accuracy: 0.9861

Epoch 00282: val_loss did not improve from 0.14007
Epoch 283/400
6/6 [==============================] - 0s 11ms/step - loss: 0.0417 - accuracy: 0.9821 - val_loss: 0.3382 - val_accuracy: 0.9861

Epoch 00283: val_loss did not improve from 0.14007
Epoch 284/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0154 - accuracy: 0.9940 - val_loss: 0.3304 - val_accuracy: 0.9861

Epoch 00284: val_loss did not improve from 0.14007
Epoch 285/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0596 - accuracy: 0.9940 - val_loss: 0.3411 - val_accuracy: 0.9861

Epoch 00285: val_loss did not improve from 0.14007
Epoch 286/400
6/6 [==============================] - 0s 13ms/step - loss: 0.1012 - accuracy: 0.9762 - val_loss: 0.3179 - val_accuracy: 0.9861

Epoch 00286: val_loss did not improve from 0.14007
Epoch 287/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0160 - accuracy: 0.9881 - val_loss: 0.2445 - val_accuracy: 0.9861

Epoch 00287: val_loss did not improve from 0.14007
Epoch 288/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0013 - accuracy: 1.0000 - val_loss: 0.1993 - val_accuracy: 0.9861

Epoch 00288: val_loss did not improve from 0.14007
Epoch 289/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0871 - accuracy: 0.9940 - val_loss: 0.2242 - val_accuracy: 0.9861

Epoch 00289: val_loss did not improve from 0.14007
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Epoch 290/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0150 - accuracy: 0.9940 - val_loss: 0.2701 - val_accuracy: 0.9861

Epoch 00290: val_loss did not improve from 0.14007
Epoch 291/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0251 - accuracy: 0.9940 - val_loss: 0.3147 - val_accuracy: 0.9861

Epoch 00291: val_loss did not improve from 0.14007
Epoch 292/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0933 - accuracy: 0.9881 - val_loss: 0.3764 - val_accuracy: 0.9722

Epoch 00292: val_loss did not improve from 0.14007
Epoch 293/400
6/6 [==============================] - 0s 14ms/step - loss: 0.1836 - accuracy: 0.9940 - val_loss: 0.4149 - val_accuracy: 0.9722

Epoch 00293: val_loss did not improve from 0.14007
Epoch 294/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0543 - accuracy: 0.9821 - val_loss: 0.3781 - val_accuracy: 0.9722

Epoch 00294: val_loss did not improve from 0.14007
Epoch 295/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0717 - accuracy: 0.9881 - val_loss: 0.3658 - val_accuracy: 0.9861

Epoch 00295: val_loss did not improve from 0.14007
Epoch 296/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0172 - accuracy: 0.9940 - val_loss: 0.3865 - val_accuracy: 0.9861

Epoch 00296: val_loss did not improve from 0.14007
Epoch 297/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0786 - accuracy: 0.9881 - val_loss: 0.4110 - val_accuracy: 0.9722

Epoch 00297: val_loss did not improve from 0.14007
Epoch 298/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0561 - accuracy: 0.9940 - val_loss: 0.4576 - val_accuracy: 0.9722

Epoch 00298: val_loss did not improve from 0.14007
Epoch 299/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0429 - accuracy: 0.9762 - val_loss: 0.5041 - val_accuracy: 0.9722

Epoch 00299: val_loss did not improve from 0.14007
Epoch 300/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0400 - accuracy: 0.9821 - val_loss: 0.5150 - val_accuracy: 0.9722

Epoch 00300: val_loss did not improve from 0.14007
Epoch 301/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0586 - accuracy: 0.9881 - val_loss: 0.5361 - val_accuracy: 0.9861

Epoch 00301: val_loss did not improve from 0.14007
Epoch 302/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0279 - accuracy: 0.9881 - val_loss: 0.5655 - val_accuracy: 0.9861

Epoch 00302: val_loss did not improve from 0.14007
Epoch 303/400
6/6 [==============================] - 0s 14ms/step - loss: 0.1351 - accuracy: 0.9881 - val_loss: 0.4427 - val_accuracy: 0.9861

Epoch 00303: val_loss did not improve from 0.14007
Epoch 304/400
6/6 [==============================] - 0s 13ms/step - loss: 7.3154e-04 - accuracy: 1.0000 - val_loss: 0.3120 - val_accuracy: 0.9861

Epoch 00304: val_loss did not improve from 0.14007
Epoch 305/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0057 - accuracy: 0.9940 - val_loss: 0.2513 - val_accuracy: 0.9722

Epoch 00305: val_loss did not improve from 0.14007
Epoch 306/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0180 - accuracy: 0.9881 - val_loss: 0.2299 - val_accuracy: 0.9722

Epoch 00306: val_loss did not improve from 0.14007
Epoch 307/400
```

```
6/6 [==============================] - 0s 14ms/step - loss: 0.1512 - accuracy: 0.9762 - val_loss: 0.3034 - val_accuracy: 0.9722

Epoch 00307: val_loss did not improve from 0.14007
Epoch 308/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0871 - accuracy: 0.9821 - val_loss: 0.4398 - val_accuracy: 0.9722

Epoch 00308: val_loss did not improve from 0.14007
Epoch 309/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0119 - accuracy: 0.9940 - val_loss: 0.5274 - val_accuracy: 0.9722

Epoch 00309: val_loss did not improve from 0.14007
Epoch 310/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0741 - accuracy: 0.9762 - val_loss: 0.5404 - val_accuracy: 0.9722

Epoch 00310: val_loss did not improve from 0.14007
Epoch 311/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0736 - accuracy: 0.9702 - val_loss: 0.4027 - val_accuracy: 0.9722

Epoch 00311: val_loss did not improve from 0.14007
Epoch 312/400
6/6 [==============================] - 0s 18ms/step - loss: 0.0319 - accuracy: 0.9940 - val_loss: 0.2971 - val_accuracy: 0.9861

Epoch 00312: val_loss did not improve from 0.14007
Epoch 313/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0149 - accuracy: 0.9940 - val_loss: 0.2617 - val_accuracy: 0.9861

Epoch 00313: val_loss did not improve from 0.14007
Epoch 314/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0764 - accuracy: 0.9881 - val_loss: 0.2310 - val_accuracy: 0.9861

Epoch 00314: val_loss did not improve from 0.14007
Epoch 315/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0216 - accuracy: 1.0000 - val_loss: 0.2980 - val_accuracy: 0.9722

Epoch 00315: val_loss did not improve from 0.14007
Epoch 316/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0098 - accuracy: 0.9940 - val_loss: 0.3297 - val_accuracy: 0.9722

Epoch 00316: val_loss did not improve from 0.14007
Epoch 317/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0106 - accuracy: 0.9940 - val_loss: 0.3201 - val_accuracy: 0.9722

Epoch 00317: val_loss did not improve from 0.14007
Epoch 318/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0498 - accuracy: 0.9881 - val_loss: 0.3229 - val_accuracy: 0.9722

Epoch 00318: val_loss did not improve from 0.14007
Epoch 319/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0233 - accuracy: 0.9881 - val_loss: 0.3604 - val_accuracy: 0.9722

Epoch 00319: val_loss did not improve from 0.14007
Epoch 320/400
6/6 [==============================] - 0s 18ms/step - loss: 0.0120 - accuracy: 0.9940 - val_loss: 0.4040 - val_accuracy: 0.9722

Epoch 00320: val_loss did not improve from 0.14007
Epoch 321/400
6/6 [==============================] - 0s 18ms/step - loss: 0.0591 - accuracy: 0.9881 - val_loss: 0.4266 - val_accuracy: 0.9722

Epoch 00321: val_loss did not improve from 0.14007
Epoch 322/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0322 - accuracy: 0.9881 - val_loss: 0.4205 - val_accuracy: 0.9722

Epoch 00322: val_loss did not improve from 0.14007
Epoch 323/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0034 - accuracy: 1.0000 - val_loss: 0.4214 - val_accuracy: 0.9722

Epoch 00323: val_loss did not improve from 0.14007
Epoch 324/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0054 - accuracy: 1.0000 - val_loss: 0.4255 - val_accuracy: 0.9722
```

```
Epoch 00324: val_loss did not improve from 0.14007
Epoch 325/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0021 - accuracy: 1.0000 - val_loss: 0.4329 - val_accuracy: 0.9722

Epoch 00325: val_loss did not improve from 0.14007
Epoch 326/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0079 - accuracy: 1.0000 - val_loss: 0.4317 - val_accuracy: 0.9722

Epoch 00326: val_loss did not improve from 0.14007
Epoch 327/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0348 - accuracy: 0.9881 - val_loss: 0.4194 - val_accuracy: 0.9861

Epoch 00327: val_loss did not improve from 0.14007
Epoch 328/400
6/6 [==============================] - 0s 14ms/step - loss: 8.6354e-05 - accuracy: 1.0000 - val_loss: 0.4492 - val_accuracy: 0.9861

Epoch 00328: val_loss did not improve from 0.14007
Epoch 329/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0147 - accuracy: 0.9940 - val_loss: 0.4594 - val_accuracy: 0.9861

Epoch 00329: val_loss did not improve from 0.14007
Epoch 330/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0040 - accuracy: 1.0000 - val_loss: 0.4602 - val_accuracy: 0.9861

Epoch 00330: val_loss did not improve from 0.14007
Epoch 331/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0110 - accuracy: 0.9940 - val_loss: 0.4800 - val_accuracy: 0.9861

Epoch 00331: val_loss did not improve from 0.14007
Epoch 332/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0693 - accuracy: 0.9762 - val_loss: 0.5870 - val_accuracy: 0.9722

Epoch 00332: val_loss did not improve from 0.14007
Epoch 333/400
6/6 [==============================] - 0s 13ms/step - loss: 1.0713e-04 - accuracy: 1.0000 - val_loss: 0.7053 - val_accuracy: 0.9722

Epoch 00333: val_loss did not improve from 0.14007
Epoch 334/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0025 - accuracy: 1.0000 - val_loss: 0.7511 - val_accuracy: 0.9722

Epoch 00334: val_loss did not improve from 0.14007
Epoch 335/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0026 - accuracy: 1.0000 - val_loss: 0.7484 - val_accuracy: 0.9722

Epoch 00335: val_loss did not improve from 0.14007
Epoch 336/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0606 - accuracy: 0.9881 - val_loss: 0.7510 - val_accuracy: 0.9722

Epoch 00336: val_loss did not improve from 0.14007
Epoch 337/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0044 - accuracy: 1.0000 - val_loss: 0.7907 - val_accuracy: 0.9722

Epoch 00337: val_loss did not improve from 0.14007
Epoch 338/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0717 - accuracy: 0.9940 - val_loss: 0.8414 - val_accuracy: 0.9722

Epoch 00338: val_loss did not improve from 0.14007
Epoch 339/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0076 - accuracy: 1.0000 - val_loss: 0.8321 - val_accuracy: 0.9722

Epoch 00339: val_loss did not improve from 0.14007
Epoch 340/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0717 - accuracy: 0.9881 - val_loss: 0.7942 - val_accuracy: 0.9722

Epoch 00340: val_loss did not improve from 0.14007
Epoch 341/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0127 - accuracy: 0.9940 - val_loss: 0.7212 - val_accuracy: 0.9722
```

```
Epoch 00341: val_loss did not improve from 0.14007
Epoch 342/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0317 - accuracy: 0.9940 - val_loss: 0.6703 - val_accuracy: 0.9722

Epoch 00342: val_loss did not improve from 0.14007
Epoch 343/400
6/6 [==============================] - 0s 13ms/step - loss: 0.1277 - accuracy: 0.9940 - val_loss: 0.6566 - val_accuracy: 0.9722

Epoch 00343: val_loss did not improve from 0.14007
Epoch 344/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0126 - accuracy: 0.9940 - val_loss: 0.7023 - val_accuracy: 0.9722

Epoch 00344: val_loss did not improve from 0.14007
Epoch 345/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0720 - accuracy: 0.9821 - val_loss: 0.7006 - val_accuracy: 0.9722

Epoch 00345: val_loss did not improve from 0.14007
Epoch 346/400
6/6 [==============================] - 0s 13ms/step - loss: 9.1578e-04 - accuracy: 1.0000 - val_loss: 0.6240 - val_accuracy: 0.9722

Epoch 00346: val_loss did not improve from 0.14007
Epoch 347/400
6/6 [==============================] - 0s 13ms/step - loss: 0.1482 - accuracy: 0.9881 - val_loss: 0.5203 - val_accuracy: 0.9722

Epoch 00347: val_loss did not improve from 0.14007
Epoch 348/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0755 - accuracy: 0.9821 - val_loss: 0.4920 - val_accuracy: 0.9861

Epoch 00348: val_loss did not improve from 0.14007
Epoch 349/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0048 - accuracy: 1.0000 - val_loss: 0.4916 - val_accuracy: 0.9861

Epoch 00349: val_loss did not improve from 0.14007
Epoch 350/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0382 - accuracy: 0.9881 - val_loss: 0.5037 - val_accuracy: 0.9861

Epoch 00350: val_loss did not improve from 0.14007
Epoch 351/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0078 - accuracy: 0.9940 - val_loss: 0.5078 - val_accuracy: 0.9861

Epoch 00351: val_loss did not improve from 0.14007
Epoch 352/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0242 - accuracy: 0.9940 - val_loss: 0.5201 - val_accuracy: 0.9861

Epoch 00352: val_loss did not improve from 0.14007
Epoch 353/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0461 - accuracy: 0.9940 - val_loss: 0.5331 - val_accuracy: 0.9861

Epoch 00353: val_loss did not improve from 0.14007
Epoch 354/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0183 - accuracy: 0.9940 - val_loss: 0.5159 - val_accuracy: 0.9861

Epoch 00354: val_loss did not improve from 0.14007
Epoch 355/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0011 - accuracy: 1.0000 - val_loss: 0.5122 - val_accuracy: 0.9861

Epoch 00355: val_loss did not improve from 0.14007
Epoch 356/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0226 - accuracy: 0.9940 - val_loss: 0.5256 - val_accuracy: 0.9861

Epoch 00356: val_loss did not improve from 0.14007
Epoch 357/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0070 - accuracy: 1.0000 - val_loss: 0.5364 - val_accuracy: 0.9861

Epoch 00357: val_loss did not improve from 0.14007
Epoch 358/400
6/6 [==============================] - 0s 13ms/step - loss: 8.9511e-04 - accuracy: 1.0000 - val_loss: 0.5422 - val_accuracy: 0.9861

Epoch 00358: val_loss did not improve from 0.14007
```

```
Epoch 359/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0227 - accuracy: 0.9940 - val_loss: 0.5465 - val_accuracy: 0.9861

Epoch 00359: val_loss did not improve from 0.14007
Epoch 360/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0273 - accuracy: 0.9940 - val_loss: 0.5523 - val_accuracy: 0.9861

Epoch 00360: val_loss did not improve from 0.14007
Epoch 361/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0334 - accuracy: 0.9940 - val_loss: 0.5990 - val_accuracy: 0.9722

Epoch 00361: val_loss did not improve from 0.14007
Epoch 362/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0053 - accuracy: 1.0000 - val_loss: 0.6035 - val_accuracy: 0.9722

Epoch 00362: val_loss did not improve from 0.14007
Epoch 363/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0138 - accuracy: 0.9940 - val_loss: 0.6014 - val_accuracy: 0.9722

Epoch 00363: val_loss did not improve from 0.14007
Epoch 364/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0406 - accuracy: 0.9881 - val_loss: 0.6253 - val_accuracy: 0.9722

Epoch 00364: val_loss did not improve from 0.14007
Epoch 365/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0173 - accuracy: 0.9940 - val_loss: 0.6879 - val_accuracy: 0.9722

Epoch 00365: val_loss did not improve from 0.14007
Epoch 366/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0072 - accuracy: 0.9940 - val_loss: 0.6947 - val_accuracy: 0.9722

Epoch 00366: val_loss did not improve from 0.14007
Epoch 367/400
6/6 [==============================] - 0s 14ms/step - loss: 1.7830e-04 - accuracy: 1.0000 - val_loss: 0.6906 - val_accuracy: 0.9722

Epoch 00367: val_loss did not improve from 0.14007
Epoch 368/400
6/6 [==============================] - 0s 15ms/step - loss: 2.4134e-04 - accuracy: 1.0000 - val_loss: 0.6876 - val_accuracy: 0.9722

Epoch 00368: val_loss did not improve from 0.14007
Epoch 369/400
6/6 [==============================] - 0s 17ms/step - loss: 5.2806e-04 - accuracy: 1.0000 - val_loss: 0.6852 - val_accuracy: 0.9722

Epoch 00369: val_loss did not improve from 0.14007
Epoch 370/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0180 - accuracy: 0.9940 - val_loss: 0.6826 - val_accuracy: 0.9722

Epoch 00370: val_loss did not improve from 0.14007
Epoch 371/400
6/6 [==============================] - 0s 16ms/step - loss: 1.1707e-05 - accuracy: 1.0000 - val_loss: 0.6801 - val_accuracy: 0.9722

Epoch 00371: val_loss did not improve from 0.14007
Epoch 372/400
6/6 [==============================] - 0s 16ms/step - loss: 4.7490e-06 - accuracy: 1.0000 - val_loss: 0.6786 - val_accuracy: 0.9722

Epoch 00372: val_loss did not improve from 0.14007
Epoch 373/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0236 - accuracy: 0.9940 - val_loss: 0.6787 - val_accuracy: 0.9722

Epoch 00373: val_loss did not improve from 0.14007
Epoch 374/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0047 - accuracy: 0.9940 - val_loss: 0.6253 - val_accuracy: 0.9722

Epoch 00374: val_loss did not improve from 0.14007
Epoch 375/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0069 - accuracy: 0.9940 - val_loss: 0.5209 - val_accuracy: 0.9722

Epoch 00375: val_loss did not improve from 0.14007
Epoch 376/400
```

```
6/6 [==============================] - 0s 14ms/step - loss: 0.0423 - accuracy: 0.9940 - val_loss: 0.4561 - val_accuracy: 0.9722

Epoch 00376: val_loss did not improve from 0.14007
Epoch 377/400
6/6 [==============================] - 0s 15ms/step - loss: 0.0747 - accuracy: 0.9881 - val_loss: 0.4293 - val_accuracy: 0.9861

Epoch 00377: val_loss did not improve from 0.14007
Epoch 378/400
6/6 [==============================] - 0s 14ms/step - loss: 2.3811e-04 - accuracy: 1.0000 - val_loss: 0.4370 - val_accuracy: 0.9861

Epoch 00378: val_loss did not improve from 0.14007
Epoch 379/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0016 - accuracy: 1.0000 - val_loss: 0.4505 - val_accuracy: 0.9861

Epoch 00379: val_loss did not improve from 0.14007
Epoch 380/400
6/6 [==============================] - 0s 14ms/step - loss: 7.6704e-04 - accuracy: 1.0000 - val_loss: 0.4579 - val_accuracy: 0.9861

Epoch 00380: val_loss did not improve from 0.14007
Epoch 381/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0142 - accuracy: 0.9940 - val_loss: 0.4578 - val_accuracy: 0.9861

Epoch 00381: val_loss did not improve from 0.14007
Epoch 382/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0121 - accuracy: 0.9940 - val_loss: 0.4655 - val_accuracy: 0.9861

Epoch 00382: val_loss did not improve from 0.14007
Epoch 383/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0178 - accuracy: 0.9940 - val_loss: 0.4727 - val_accuracy: 0.9861

Epoch 00383: val_loss did not improve from 0.14007
Epoch 384/400
6/6 [==============================] - 0s 16ms/step - loss: 0.0167 - accuracy: 0.9940 - val_loss: 0.4792 - val_accuracy: 0.9861

Epoch 00384: val_loss did not improve from 0.14007
Epoch 385/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0021 - accuracy: 1.0000 - val_loss: 0.4815 - val_accuracy: 0.9861

Epoch 00385: val_loss did not improve from 0.14007
Epoch 386/400
6/6 [==============================] - 0s 17ms/step - loss: 0.0094 - accuracy: 0.9940 - val_loss: 0.4761 - val_accuracy: 0.9861

Epoch 00386: val_loss did not improve from 0.14007
Epoch 387/400
6/6 [==============================] - 0s 13ms/step - loss: 2.1266e-05 - accuracy: 1.0000 - val_loss: 0.4721 - val_accuracy: 0.9861

Epoch 00387: val_loss did not improve from 0.14007
Epoch 388/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0016 - accuracy: 1.0000 - val_loss: 0.4692 - val_accuracy: 0.9861

Epoch 00388: val_loss did not improve from 0.14007
Epoch 389/400
6/6 [==============================] - 0s 13ms/step - loss: 9.3414e-05 - accuracy: 1.0000 - val_loss: 0.4675 - val_accuracy: 0.9861

Epoch 00389: val_loss did not improve from 0.14007
Epoch 390/400
6/6 [==============================] - 0s 17ms/step - loss: 3.2257e-04 - accuracy: 1.0000 - val_loss: 0.4682 - val_accuracy: 0.9861

Epoch 00390: val_loss did not improve from 0.14007
Epoch 391/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0716 - accuracy: 0.9940 - val_loss: 0.4655 - val_accuracy: 0.9861

Epoch 00391: val_loss did not improve from 0.14007
Epoch 392/400
6/6 [==============================] - 0s 12ms/step - loss: 0.0029 - accuracy: 1.0000 - val_loss: 0.4638 - val_accuracy: 0.9861

Epoch 00392: val_loss did not improve from 0.14007
Epoch 393/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0046 - accuracy: 0.9940 - val_loss: 0.4864 - val_accuracy: 0.9861
```

```
Epoch 00393: val_loss did not improve from 0.14007
Epoch 394/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0019 - accuracy: 1.0000 - val_loss: 0.4994 - val_accuracy: 0.9861

Epoch 00394: val_loss did not improve from 0.14007
Epoch 395/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0172 - accuracy: 0.9940 - val_loss: 0.5111 - val_accuracy: 0.9861

Epoch 00395: val_loss did not improve from 0.14007
Epoch 396/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0020 - accuracy: 1.0000 - val_loss: 0.5230 - val_accuracy: 0.9861

Epoch 00396: val_loss did not improve from 0.14007
Epoch 397/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0418 - accuracy: 0.9940 - val_loss: 0.5222 - val_accuracy: 0.9861

Epoch 00397: val_loss did not improve from 0.14007
Epoch 398/400
6/6 [==============================] - 0s 14ms/step - loss: 7.0529e-05 - accuracy: 1.0000 - val_loss: 0.5098 - val_accuracy: 0.9861

Epoch 00398: val_loss did not improve from 0.14007
Epoch 399/400
6/6 [==============================] - 0s 13ms/step - loss: 0.0228 - accuracy: 0.9940 - val_loss: 0.5054 - val_accuracy: 0.9861

Epoch 00399: val_loss did not improve from 0.14007
Epoch 400/400
6/6 [==============================] - 0s 14ms/step - loss: 0.0038 - accuracy: 1.0000 - val_loss: 0.5002 - val_accuracy: 0.9861

Epoch 00400: val_loss did not improve from 0.14007
Training completed in time:  0:00:31.976818
```

In [23]:
```python
# Evaluating the model on the training and testing set
score = model.evaluate(x_train, y_train, verbose=0)
print("Training Accuracy: ", score[1])

score = model.evaluate(x_test, y_test, verbose=0)
print("Testing Accuracy: ", score[1])
```

```
Training Accuracy:  1.0
Testing Accuracy:  0.9861111044883728
```

In [24]:
```python
y_pred =  model.predict(x_test)
from sklearn.metrics import confusion_matrix
confusion_matrix(y_test.argmax(axis=1), y_pred.argmax(axis=1))
print(confusion_matrix)
```

```
<function confusion_matrix at 0x7f5be77e4700>
```

In [25]:
```python
from sklearn.metrics import confusion_matrix
import seaborn as sns
import matplotlib.pyplot as plt


cm =confusion_matrix(y_test.argmax(axis=1), y_pred.argmax(axis=1))
index = ["KAWASAKI","KTM","PULSAR","APACHE","HARLEY","ENFIELD"]
columns = ["KAWASAKI","KTM","PULSAR","APACHE","HARLEY","ENFIELD"]
cm_df = pd.DataFrame(cm,columns,index)
plt.figure(figsize=(10,6))
sns.heatmap(cm_df, annot=True)
```

Out[25]: <AxesSubplot:>
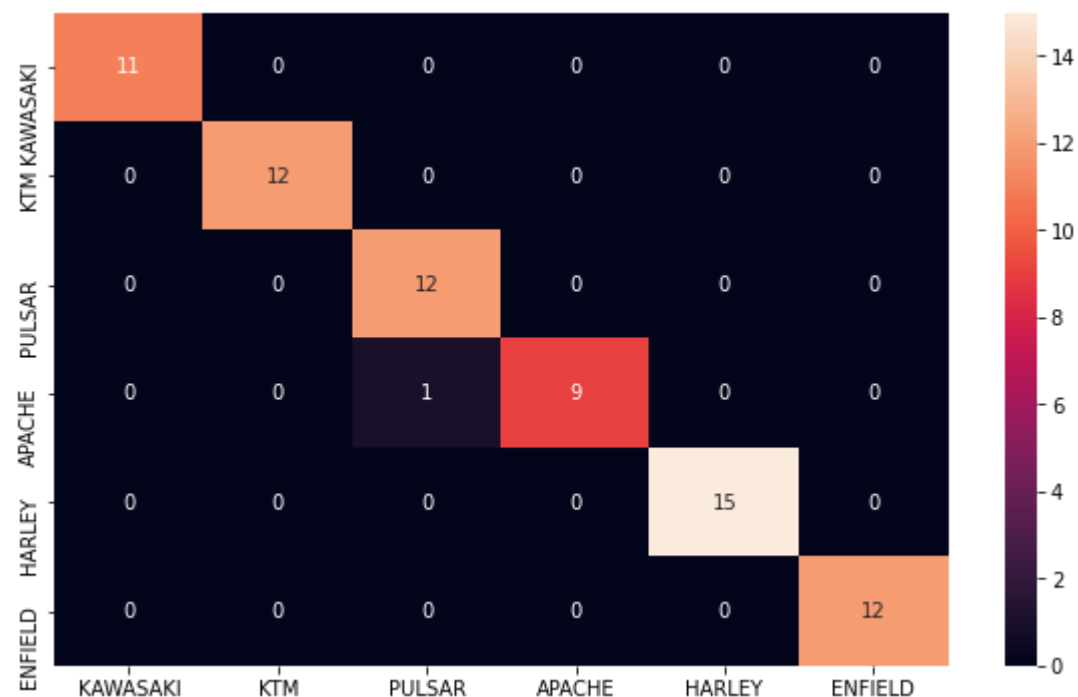
In [26]:
```python
import librosa
import numpy as np

def extract_feature(file_name):

    try:
        audio_data, sample_rate = librosa.load(file_name, res_type='kaiser_fast')
        mfccs = librosa.feature.mfcc(y=audio_data, sr=sample_rate, n_mfcc=40)
        mfccsscaled = np.mean(mfccs.T,axis=0)

    except Exception as e:
        print("Error encountered while parsing file: ", file)
        return None, None

    return np.array([mfccsscaled])
```

In [27]:
```python
#global cur_labelb
#global print_prediction
#global cur_labelb
def print_prediction(file_name):
        prediction_feature = extract_feature(file_name)
        predicted_vector = np.argmax(model.predict(prediction_feature), axis=-1)
        predicted_class = le.inverse_transform(predicted_vector)
        print("The predicted class is:", predicted_class[0], '\n')
        global cur_labelb
        cur_labelb=ttk.Label(canvas,text = str("The predicted class is:")+str( predicted_class[0]), style='sp.TLabel')
        cur_labelb.place(x=790,y=900)
        #label1 = tk.Label(root, text = str("The predicted class is:")+str( predicted_class[0])).place(x=600,y=900)
        #canvas.create_text(400,200, text = str("The predicted class is:")+str( predicted_class[0]),font =("Helvetica",15),fill="white")
        predicted_proba_vector = model.predict(prediction_feature)
        predicted_proba = predicted_proba_vector[0]

        for i in range(len(predicted_proba)):
            pro.append(format(predicted_proba[i], '.5f'))
            category = le.inverse_transform(np.array([i]))
            print(category[0], "\t\t : ", format(predicted_proba[i], '.5f') )
            cur_label='Label'+str(i)
            cur_label=ttk.Label(canvas,text = str(category[0])+" = "+str(format(predicted_proba[i], '.3f')),style='green/black.TLabel')
            cur_label.grid(column=100,row=i+300,sticky='')
            #label = tkinter.Label(canvas, text = str(category[0])+"\t\t : "+str(format(predicted_proba[i], '.5f'))).grid(x=i+100,y=i+200)
```

In [28]:
```python
def record():
    FORMAT = pyaudio.paInt16
    CHANNELS = 2
    RATE = 44100
    CHUNK = 1024
    RECORD_SECONDS = 5
    WAVE_OUTPUT_FILENAME = "file2.wav"

    audio = pyaudio.PyAudio()
    # start Recording
    stream = audio.open(format=FORMAT, channels=CHANNELS,
                    rate=RATE, input=True,
                    frames_per_buffer=CHUNK)
    print ("recording...")
    frames = []

    for i in range(0, int(RATE / CHUNK * RECORD_SECONDS)):
        data = stream.read(CHUNK)
        frames.append(data)
    print ("finished recording")
    global cur_labela
    cur_labela=ttk.Label(canvas,text = "finished recording",style='green/black.TLabel')
    cur_labela.place(x=790,y=850)

    # stop Recording
    stream.stop_stream()
    stream.close()
    audio.terminate()

    waveFile = wave.open(WAVE_OUTPUT_FILENAME, 'wb')
    waveFile.setnchannels(CHANNELS)
    waveFile.setsampwidth(audio.get_sample_size(FORMAT))
    waveFile.setframerate(RATE)
    waveFile.writeframes(b''.join(frames))
    waveFile.close()
def prd():
    filename = '/home/ece/Music/file2.wav'
    print_prediction(filename)

def restart():
    cur_labela=ttk.Label(canvas,text = "                       ",style='green/black.TLabel')
    cur_labela.place(x=790,y=850)
    cur_labelb=ttk.Label(canvas,text = "                              ", style='sp.TLabel')
    cur_labelb.place(x=790,y=900)


def play():
    pygame.mixer.init()
    pygame.mixer.music.load("/home/ece/Music/file2.wav")
    pygame.mixer.music.play(loops=0)

def openfile():
    filepath=filedialog.askopenfilename()
    print(filepath)
    print_prediction(filepath)
```

In [29]:
```python
import pygame
import os
import pyaudio
```

```python
import wave
from tkinter import ttk
```

```
pygame 2.0.1 (SDL 2.0.14, Python 3.8.5)
Hello from the pygame community. https://www.pygame.org/contribute.html
```

In [30]:
```python
from tkinter.ttk import *
from tkinter import *
import tkinter
from tkinter import filedialog
canvas = Tk()
canvas.geometry('1920x1080')
canvas = Canvas(width=1920, height=1080, bg='black')

canvas.pack(expand=YES, fill=BOTH)

gif1 = PhotoImage(file='fn.png')

canvas.create_image(0, 0, image=gif1, anchor=NW)
style = ttk.Style()
ttk.Style().configure('green/black.TLabel',font=('Helvetica', 20,'bold'), foreground='#e9d10a', background='#020613')
ttk.Style().configure('green/black.TButton',font=('Helvetica', 20,'bold'), foreground='#1164e8', background='#010101')
ttk.Style().configure('sp.TLabel',font=('ariel', 25,'bold'), foreground='#e25d12', background='#020613')

button_rec = ttk.Button(canvas, text='START' ,style='green/black.TButton',command=record)
button_rec.place(x=500,y=750)

button_rec = ttk.Button(canvas, text='PREDICT',style='green/black.TButton',command=prd)
button_rec.place(x=1280,y=750)

button_rec = ttk.Button(canvas, text='PREDICT from FILE',style='green/black.TButton',command=openfile)
button_rec.place(x=1280,y=850)

button_rec = ttk.Button(canvas, text='RESET',style='green/black.TButton',command=restart)
button_rec.place(x=880,y=950)

play_button = ttk.Button(canvas, text='PLAY',style='green/black.TButton', command=play)
play_button.place(x=880,y=280)
mainloop()
```

In [ ]: