Intent Classification

NLP Individual Submission

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Group- 1

Intent Classification is mainly used to understand the context of the text words given by the user. In this indivudual submission I have explored some different techniques through which we can classify the intent of the chatbot. This is the 1st Python file (.ipynb) and the second python file contains a initial stage chatbot which works on Intent Classification.

The dataset used in this Python file is a substitution dataset for Intent Classification. In total, I have used 2 datasets to satisfy the conditions using Python NLTK libraries.

The datasets are taken from Kaggle and some of the libraries and specification a referred from GitHub, Kaggle and Python documentation. The links to the dataset are given below.

Dataset Links:-

1. "Text Commands.csv" - https://github.com/KoushikiDasgupta/Intent-Analysis-for-Offline-Voice-Commanding/blob/main/CNN model1/TextCommands.csv

2. Atis Intent Train and Test - https://www.kaggle.com/datasets/hassanamin/atis-airlinetravelinformationsystem

In [1]:

```python
import warnings
warnings.filterwarnings('ignore')
```

Intent Classification using Convolutional Neural Network (CNN)

In [2]:

```python
import pandas as pd
data=pd.read_csv(r'D:\Surrey\Semester\Semester 2\NLP\TextCommands.csv')
```

In [3]:

```python
data.columns=['text', 'label', 'misc']
data.head()
```

Out[3]:

	text	label	misc
0	Undo the last sentence	1	NaN
1	Undo the last word	1	NaN
2	Can you undo the last sentence	1	NaN
3	Please undo the text	1	NaN
4	Undo the selected text	1	NaN

The dataset contains different labels. The total intents labelled are from 1 to 26. The dataset needs to be in balanced manner.

For data preprocessing, we need to go through Tokenizing, Sequence Padding. Tokenization is the collection of unique words from the dataset and are assigned to integer. Padding, on the other hand represents the dataset with zeros.

In [4]:

```python
import numpy as np
import tensorflow as tf
from keras.preprocessing.text import Tokenizer
from keras.preprocessing.sequence import pad_sequences
#tf.keras.utils.to_categorical
from tensorflow.keras.utils import to_categorical
MAX_SEQUENCE_LENGTH=10
MAX_NUM_WORDS=5000
tokenizer=Tokenizer(num_words=MAX_NUM_WORDS)
tokenizer.fit_on_texts(data['text'])
sequences=tokenizer.texts_to_sequences(data['text'])
word_index=tokenizer.word_index
#print('Unique tokens are:' %len(word_index))
data1=pad_sequences(sequences, maxlen=MAX_SEQUENCE_LENGTH)
labels=to_categorical(np.asarray(data['label']))
print('Data tensorflow', data1.shape)
print('Label tensorflow', labels.shape)
```

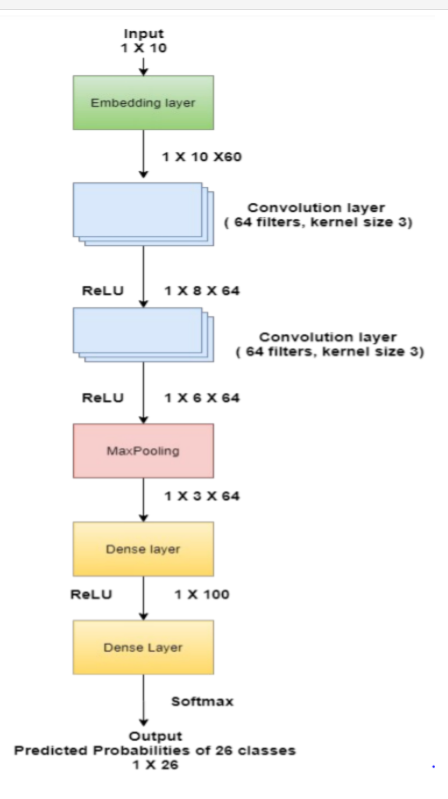
```
Data tensorflow (399, 10)
Label tensorflow (399, 27)
```

In [5]:

```python
VALIDATION_SPLIT=0.1
indices=np.arange(data1.shape[0])
np.random.shuffle(indices)
data1=data1[indices]
labels=labels[indices]
num_validation_samples=int(VALIDATION_SPLIT * data1.shape[0])
x_train=data1[:-num_validation_samples]
y_train=labels[:-num_validation_samples]
x_val=data1[-num_validation_samples:]
y_val=labels[-num_validation_samples:]
```

In [6]:

```python
from keras.layers import Dense, Input, GlobalMaxPooling1D
from keras.layers import Conv1D, MaxPooling1D, Embedding, Flatten
from keras.models import Model
from keras.models import Sequential
from keras.initializers import Constant
EMBEDDING_DIM=60
num_words=min(MAX_NUM_WORDS, len(word_index) +1)
embedding_layer=Embedding(num_words, EMBEDDING_DIM, input_length=MAX_SEQUENCE_LENGTH,
```



Reference Link: - https://www.researchgate.net/figure/Block-diagram-of-CNN-architecture_fig2_341019121

Why I have used CNN as one of my technique?

As we have seen in lectures, neural networks can identify relevant bigrams, trigrams, n-grams depending on the kernel size. The order of words doesn't matter here and this is one of the advantage of using CNN in detecting the Intent.

Similar to sentiment analysis, the CNN rectifies the text by the presence or absence of some phrases.

In [7]:

```python
sequence_input=Input(shape=(MAX_SEQUENCE_LENGTH,), dtype='int32')
embedded_sequences=embedding_layer(sequence_input)
x=Conv1D(64, 3, activation='relu')(embedded_sequences)
x=Conv1D(64, 3, activation='relu')(x)
x=MaxPooling1D(2)(x)
x=Flatten()(x)
x=Dense(100, activation='relu')(x)
preds=Dense(27, activation='softmax')(x)
model=Model(sequence_input, preds)
model.compile(loss='categorical_crossentropy', optimizer='rmsprop', metrics=['acc'])
model.summary()
```

```
Model: "model"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 input_1 (InputLayer)        [(None, 10)]              0

 embedding (Embedding)       (None, 10, 60)            8580

 conv1d (Conv1D)             (None, 8, 64)             11584

 conv1d_1 (Conv1D)           (None, 6, 64)             12352

 max_pooling1d (MaxPooling1D  (None, 3, 64)            0
 )

 flatten (Flatten)           (None, 192)               0

 dense (Dense)               (None, 100)               19300

 dense_1 (Dense)             (None, 27)                2727

=================================================================
Total params: 54,543
Trainable params: 54,543
Non-trainable params: 0
_________________________________________________________________
```

In [8]:

```python
s=0.0
for i in range(1, 50):
    model.fit(x_train, y_train, batch_size=50, epochs=30, validation_data=(x_val, y_va
    scores=model.evaluate(x_val, y_val, verbose=0)
    s=s+(scores[1]*100)
```

```
Epoch 1/30
8/8 [==============================] - 1s 26ms/step - loss: 3.2819 - acc: 0.0861 - val
_loss: 3.2537 - val_acc: 0.1026
Epoch 2/30
8/8 [==============================] - 0s 5ms/step - loss: 3.2143 - acc: 0.1361 - val_
loss: 3.1915 - val_acc: 0.1538
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 3.1113 - acc: 0.1639 - val_
loss: 3.0775 - val_acc: 0.1795
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 2.9785 - acc: 0.2194 - val_
loss: 2.8949 - val_acc: 0.2308
Epoch 5/30
8/8 [==============================] - 0s 5ms/step - loss: 2.8030 - acc: 0.2667 - val_
loss: 2.7676 - val_acc: 0.2564
Epoch 6/30
8/8 [==============================] - 0s 5ms/step - loss: 2.6240 - acc: 0.2833 - val_
loss: 2.5221 - val_acc: 0.2821
Epoch 7/30
8/8 [==============================] - 0s 5ms/step - loss: 2.4240 - acc: 0.3028 - val_
loss: 2.4229 - val_acc: 0.3333
Epoch 8/30
8/8 [==============================] - 0s 5ms/step - loss: 2.2324 - acc: 0.3778 - val_
loss: 2.2712 - val_acc: 0.4359
Epoch 9/30
8/8 [==============================] - ETA: 0s - loss: 2.3921 - acc: 0.380 - 0s 5ms/st
ep - loss: 2.0337 - acc: 0.4583 - val_loss: 2.0637 - val_acc: 0.3590
Epoch 10/30
8/8 [==============================] - 0s 4ms/step - loss: 1.8446 - acc: 0.5222 - val_
loss: 1.9210 - val_acc: 0.3846
Epoch 11/30
8/8 [==============================] - 0s 4ms/step - loss: 1.6845 - acc: 0.5472 - val_
loss: 1.8482 - val_acc: 0.4615
Epoch 12/30
8/8 [==============================] - 0s 5ms/step - loss: 1.5264 - acc: 0.6167 - val_
loss: 1.8284 - val_acc: 0.4615
Epoch 13/30
8/8 [==============================] - 0s 5ms/step - loss: 1.3862 - acc: 0.6556 - val_
loss: 1.6268 - val_acc: 0.4615
Epoch 14/30
8/8 [==============================] - 0s 4ms/step - loss: 1.2439 - acc: 0.6889 - val_
loss: 1.5626 - val_acc: 0.5385
Epoch 15/30
8/8 [==============================] - 0s 5ms/step - loss: 1.1063 - acc: 0.7111 - val_
loss: 1.4383 - val_acc: 0.6923
Epoch 16/30
8/8 [==============================] - 0s 5ms/step - loss: 0.9984 - acc: 0.7750 - val_
loss: 1.3176 - val_acc: 0.5897
Epoch 17/30
8/8 [==============================] - 0s 5ms/step - loss: 0.8776 - acc: 0.8056 - val_
loss: 1.3434 - val_acc: 0.6154
Epoch 18/30
8/8 [==============================] - 0s 5ms/step - loss: 0.7787 - acc: 0.8083 - val_
loss: 1.3681 - val_acc: 0.6154
Epoch 19/30
8/8 [==============================] - 0s 5ms/step - loss: 0.6911 - acc: 0.8472 - val_
loss: 1.1493 - val_acc: 0.6154
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 0.5977 - acc: 0.8833 - val_
loss: 1.1556 - val_acc: 0.5897
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 0.5073 - acc: 0.8861 - val_
loss: 1.1300 - val_acc: 0.6410
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 0.4387 - acc: 0.9056 - val_
loss: 1.0695 - val_acc: 0.7179
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 0.3763 - acc: 0.9361 - val_
loss: 0.9544 - val_acc: 0.7692
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 0.3212 - acc: 0.9583 - val_
loss: 0.7516 - val_acc: 0.7436
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 0.2728 - acc: 0.9500 - val_
loss: 0.9284 - val_acc: 0.7179
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 0.2345 - acc: 0.9694 - val_
loss: 0.7980 - val_acc: 0.7949
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 0.1824 - acc: 0.9806 - val_
loss: 1.0629 - val_acc: 0.6667
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 0.1604 - acc: 0.9778 - val_
loss: 0.5685 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 0.1184 - acc: 0.9944 - val_
loss: 0.6399 - val_acc: 0.8718
Epoch 30/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0977 - acc: 0.9972 - val
_loss: 0.8208 - val_acc: 0.7436
Epoch 1/30
8/8 [==============================] - 0s 14ms/step - loss: 0.0798 - acc: 0.9917 - val
_loss: 0.6140 - val_acc: 0.8462
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0670 - acc: 0.9972 - val_
loss: 1.0401 - val_acc: 0.7692
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0827 - acc: 0.9806 - val_
loss: 0.8031 - val_acc: 0.7436
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0524 - acc: 0.9917 - val_
loss: 0.4875 - val_acc: 0.8974
Epoch 5/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0303 - acc: 1.0000 - val_
loss: 0.5941 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0366 - acc: 0.9944 - val_
loss: 0.5401 - val_acc: 0.8974
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0188 - acc: 1.0000 - val_
loss: 0.4537 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0185 - acc: 1.0000 - val_
loss: 0.4323 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0374 - acc: 0.9944 - val_
loss: 0.4662 - val_acc: 0.8974
Epoch 10/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0137 - acc: 0.9972 - val_
loss: 0.4594 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0071 - acc: 1.0000 - val_
loss: 0.4583 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0065 - acc: 1.0000 - val_
loss: 0.9113 - val_acc: 0.8205
Epoch 13/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0143 - acc: 1.0000 - val_
loss: 0.5304 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0077 - acc: 1.0000 - val_
loss: 0.4889 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0031 - acc: 1.0000 - val_
loss: 0.4798 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0026 - acc: 1.0000 - val_
loss: 0.5332 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0021 - acc: 1.0000 - val
_loss: 0.4506 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0022 - acc: 1.0000 - val_
loss: 0.4455 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0198 - acc: 0.9944 - val
_loss: 0.4423 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0012 - acc: 1.0000 - val_
loss: 0.4538 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 9.8975e-04 - acc: 1.0000 -
val_loss: 0.4675 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 8.8598e-04 - acc: 1.0000 -
val_loss: 0.5331 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 7.5850e-04 - acc: 1.0000 -
val_loss: 0.5493 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 9ms/step - loss: 7.9410e-04 - acc: 1.0000 -
val_loss: 0.4594 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0294 - acc: 0.9972 - val_
loss: 0.4694 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 6.3228e-04 - acc: 1.0000 -
val_loss: 0.4875 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 9ms/step - loss: 4.1348e-04 - acc: 1.0000 -
val_loss: 0.4936 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 3.1869e-04 - acc: 1.0000 -
val_loss: 0.4957 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 2.9753e-04 - acc: 1.0000 -
val_loss: 0.4815 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 5.0248e-04 - acc: 1.0000 -
val_loss: 0.4857 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 1.7229e-04 - acc: 1.0000 -
val_loss: 0.4774 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 1.5666e-04 - acc: 1.0000 -
val_loss: 0.5742 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 1.5441e-04 - acc: 1.0000 -
val_loss: 0.8747 - val_acc: 0.8462
Epoch 4/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0608 - acc: 0.9889 - val_
loss: 0.4926 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 9ms/step - loss: 1.9424e-04 - acc: 1.0000 -
val_loss: 0.4877 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 10ms/step - loss: 1.5275e-04 - acc: 1.0000 -
val_loss: 0.4697 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 1.2586e-04 - acc: 1.0000 -
val_loss: 0.4633 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1484e-04 - acc: 1.0000 -
val_loss: 0.4850 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 8.5628e-05 - acc: 1.0000 -
val_loss: 0.4972 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 6.8734e-05 - acc: 1.0000 -
val_loss: 0.5067 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 9ms/step - loss: 7.2280e-05 - acc: 1.0000 -
val_loss: 0.4551 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 4.9442e-05 - acc: 1.0000 -
val_loss: 0.5054 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 6ms/step - loss: 4.2009e-05 - acc: 1.0000 -
val_loss: 0.5084 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3213e-05 - acc: 1.0000 -
val_loss: 0.5337 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 6ms/step - loss: 3.7566e-05 - acc: 1.0000 -
val_loss: 0.4807 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 2.3364e-05 - acc: 1.0000 -
val_loss: 0.4459 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 1.5219e-05 - acc: 1.0000 -
val_loss: 0.4968 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 9ms/step - loss: 1.4800e-05 - acc: 1.0000 -
val_loss: 0.4189 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 9ms/step - loss: 2.6487e-05 - acc: 1.0000 -
val_loss: 0.5144 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0750e-05 - acc: 1.0000 -
val_loss: 0.5263 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 9ms/step - loss: 6.8837e-06 - acc: 1.0000 -
val_loss: 0.6722 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0180 - acc: 0.9972 - val_
loss: 0.5355 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 9ms/step - loss: 2.6225e-05 - acc: 1.0000 -
val_loss: 0.5036 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 1.7857e-05 - acc: 1.0000 -
val_loss: 0.4865 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3002e-05 - acc: 1.0000 -
val_loss: 0.4877 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 9.4286e-06 - acc: 1.0000 -
val_loss: 0.4901 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 7.2697e-06 - acc: 1.0000 -
val_loss: 0.5165 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 6.1608e-06 - acc: 1.0000 -
val_loss: 0.4967 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 4.8276e-06 - acc: 1.0000 -
val_loss: 0.4919 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 4.0837e-06 - acc: 1.0000 -
val_loss: 0.4765 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 15ms/step - loss: 3.3629e-06 - acc: 1.0000 -
val_loss: 0.4373 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 2.8792e-06 - acc: 1.0000 -
val_loss: 0.4169 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 5.3694e-06 - acc: 1.0000 -
val_loss: 0.4918 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 9ms/step - loss: 1.9828e-06 - acc: 1.0000 -
val_loss: 0.5512 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 10ms/step - loss: 1.9312e-06 - acc: 1.0000 -
val_loss: 0.4448 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3653e-06 - acc: 1.0000 -
val_loss: 0.4843 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1388e-06 - acc: 1.0000 -
val_loss: 0.4572 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4037e-06 - acc: 1.0000 -
val_loss: 0.5031 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 9.0697e-07 - acc: 1.0000 -
val_loss: 0.5092 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 1.1477e-06 - acc: 1.0000 -
val_loss: 0.4888 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 6ms/step - loss: 7.4439e-07 - acc: 1.0000 -
val_loss: 0.4706 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 5.3611e-07 - acc: 1.0000 -
val_loss: 0.5124 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 6ms/step - loss: 3.5995e-07 - acc: 1.0000 -
val_loss: 0.5242 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 6ms/step - loss: 2.3875e-07 - acc: 1.0000 -
val_loss: 0.5446 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 6ms/step - loss: 1.9405e-07 - acc: 1.0000 -
val_loss: 0.5243 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 2.1027e-07 - acc: 1.0000 -
val_loss: 0.5924 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 3.5465e-07 - acc: 1.0000 -
val_loss: 0.5805 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 1.4702e-07 - acc: 1.0000 -
val_loss: 0.5606 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 8.8082e-08 - acc: 1.0000 -
val_loss: 0.5512 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 9ms/step - loss: 8.2784e-08 - acc: 1.0000 -
val_loss: 0.5618 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0199e-07 - acc: 1.0000 -
val_loss: 0.5972 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 5.0995e-08 - acc: 1.0000 -
val_loss: 0.5410 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 4.9008e-08 - acc: 1.0000 -
val_loss: 0.5997 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 3.8412e-08 - acc: 1.0000 -
val_loss: 0.5651 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 4.1723e-08 - acc: 1.0000 -
val_loss: 0.5774 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 2.8147e-08 - acc: 1.0000 -
val_loss: 0.5716 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 3.1127e-08 - acc: 1.0000 -
val_loss: 0.5823 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 2.8809e-08 - acc: 1.0000 -
val_loss: 0.5768 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 3.7087e-08 - acc: 1.0000 -
val_loss: 0.5801 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 2.0199e-08 - acc: 1.0000 -
val_loss: 0.6076 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 16ms/step - loss: 2.1855e-08 - acc: 1.0000 -
val_loss: 0.5899 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6226e-08 - acc: 1.0000 -
val_loss: 0.5944 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 1.5895e-08 - acc: 1.0000 -
val_loss: 0.5799 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 1.7881e-08 - acc: 1.0000 -
val_loss: 0.6080 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 3.4107e-08 - acc: 1.0000 -
val_loss: 0.5901 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 10ms/step - loss: 1.1921e-08 - acc: 1.0000 -
val_loss: 0.6221 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 10ms/step - loss: 1.5232e-08 - acc: 1.0000 -
val_loss: 0.6065 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 9ms/step - loss: 1.2583e-08 - acc: 1.0000 -
val_loss: 0.6091 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 3.9074e-08 - acc: 1.0000 -
val_loss: 0.6076 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 1.1921e-08 - acc: 1.0000 -
val_loss: 0.6049 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 9ms/step - loss: 1.1259e-08 - acc: 1.0000 -
val_loss: 0.6127 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2583e-08 - acc: 1.0000 -
val_loss: 0.6114 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3577e-08 - acc: 1.0000 -
val_loss: 0.6244 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3577e-08 - acc: 1.0000 -
val_loss: 0.6228 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 1.2252e-08 - acc: 1.0000 -
val_loss: 0.6509 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 1.5232e-08 - acc: 1.0000 -
val_loss: 0.6223 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3245e-08 - acc: 1.0000 -
val_loss: 0.6194 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 1.5563e-08 - acc: 1.0000 -
val_loss: 0.6681 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0844 - acc: 0.9889 - val_
loss: 0.6976 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1479e-05 - acc: 1.0000 -
val_loss: 0.7336 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 4.6270e-06 - acc: 1.0000 -
val_loss: 0.7190 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 9ms/step - loss: 3.8165e-06 - acc: 1.0000 -
val_loss: 0.7493 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 9ms/step - loss: 3.1042e-06 - acc: 1.0000 -
val_loss: 0.7561 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 9ms/step - loss: 2.5868e-06 - acc: 1.0000 -
val_loss: 0.7398 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 8ms/step - loss: 2.1274e-06 - acc: 1.0000 -
val_loss: 0.7571 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 1.6971e-06 - acc: 1.0000 -
val_loss: 0.7479 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2773e-06 - acc: 1.0000 -
val_loss: 0.7755 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 9ms/step - loss: 9.7873e-07 - acc: 1.0000 -
val_loss: 0.7550 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 7.1983e-07 - acc: 1.0000 -
val_loss: 0.7639 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 10ms/step - loss: 5.0231e-07 - acc: 1.0000 -
val_loss: 0.7582 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 11ms/step - loss: 3.5198e-07 - acc: 1.0000 -
val_loss: 0.7491 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 2.5861e-07 - acc: 1.0000 -
val_loss: 0.7516 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 1.8742e-07 - acc: 1.0000 -
val_loss: 0.7519 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 1.2186e-07 - acc: 1.0000 -
val_loss: 0.7456 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 8.7751e-08 - acc: 1.0000 -
val_loss: 0.7342 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 5.8942e-08 - acc: 1.0000 -
val_loss: 0.7322 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 4.7021e-08 - acc: 1.0000 -
val_loss: 0.7298 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 9ms/step - loss: 3.1458e-08 - acc: 1.0000 -
val_loss: 0.7210 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 2.2186e-08 - acc: 1.0000 -
val_loss: 0.7102 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 1.6557e-08 - acc: 1.0000 -
val_loss: 0.6986 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3577e-08 - acc: 1.0000 -
val_loss: 0.6779 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 1.1590e-08 - acc: 1.0000 -
val_loss: 0.6721 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-09 - acc: 1.0000 -
val_loss: 0.6654 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 7.9473e-09 - acc: 1.0000 -
val_loss: 0.6430 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 9.6030e-09 - acc: 1.0000 -
val_loss: 0.6486 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-09 - acc: 1.0000 -
val_loss: 0.6535 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 6.9539e-09 - acc: 1.0000 -
val_loss: 0.6457 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 5.2982e-09 - acc: 1.0000 -
val_loss: 0.6388 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-09 - acc: 1.0000 -
val_loss: 0.6463 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 6.2916e-09 - acc: 1.0000 -
val_loss: 0.6620 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 9.2718e-09 - acc: 1.0000 -
val_loss: 0.6464 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 6.9539e-09 - acc: 1.0000 -
val_loss: 0.6361 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 8.6096e-09 - acc: 1.0000 -
val_loss: 0.6026 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 7.9473e-09 - acc: 1.0000 -
val_loss: 0.6203 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 9ms/step - loss: 7.9473e-09 - acc: 1.0000 -
val_loss: 0.6416 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0928e-08 - acc: 1.0000 -
val_loss: 0.6435 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 9ms/step - loss: 7.2850e-09 - acc: 1.0000 -
val_loss: 0.6470 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 9ms/step - loss: 9.9341e-09 - acc: 1.0000 -
val_loss: 0.6474 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 1.5232e-08 - acc: 1.0000 -
val_loss: 0.6917 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 1.7550e-08 - acc: 1.0000 -
val_loss: 0.6182 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 10ms/step - loss: 1.0928e-08 - acc: 1.0000 -
val_loss: 0.6950 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3245e-08 - acc: 1.0000 -
val_loss: 0.6588 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0369 - acc: 0.9917 - val_
loss: 0.8120 - val_acc: 0.8974
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 8.5786e-05 - acc: 1.0000 -
val_loss: 0.7819 - val_acc: 0.8974
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 2.4107e-05 - acc: 1.0000 -
val_loss: 0.7703 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4043e-05 - acc: 1.0000 -
val_loss: 0.7484 - val_acc: 0.8974
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 8.6651e-06 - acc: 1.0000 -
val_loss: 0.7353 - val_acc: 0.8974
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 5.7191e-06 - acc: 1.0000 -
val_loss: 0.7165 - val_acc: 0.8974
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 4.0438e-06 - acc: 1.0000 -
val_loss: 0.6717 - val_acc: 0.8974
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 2.7675e-06 - acc: 1.0000 -
val_loss: 0.6662 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 1.7247e-06 - acc: 1.0000 -
val_loss: 0.6567 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 1.2072e-06 - acc: 1.0000 -
val_loss: 0.6472 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 11ms/step - loss: 8.5728e-07 - acc: 1.0000 -
val_loss: 0.6380 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 9ms/step - loss: 6.1358e-07 - acc: 1.0000 -
val_loss: 0.6186 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 4.2451e-07 - acc: 1.0000 -
val_loss: 0.6241 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 3.0497e-07 - acc: 1.0000 -
val_loss: 0.6141 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 2.1358e-07 - acc: 1.0000 -
val_loss: 0.6094 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 1.5828e-07 - acc: 1.0000 -
val_loss: 0.6125 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1557e-07 - acc: 1.0000 -
val_loss: 0.6151 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 8.5102e-08 - acc: 1.0000 -
val_loss: 0.6008 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 6.3247e-08 - acc: 1.0000 -
val_loss: 0.6192 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 4.4372e-08 - acc: 1.0000 -
val_loss: 0.5930 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 3.1458e-08 - acc: 1.0000 -
val_loss: 0.5941 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 2.3511e-08 - acc: 1.0000 -
val_loss: 0.5945 - val_acc: 0.9744
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 2.0199e-08 - acc: 1.0000 -
val_loss: 0.5987 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6557e-08 - acc: 1.0000 -
val_loss: 0.5979 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 1.2252e-08 - acc: 1.0000 -
val_loss: 0.6106 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 9.6030e-09 - acc: 1.0000 -
val_loss: 0.6008 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 8.9407e-09 - acc: 1.0000 -
val_loss: 0.6099 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 9ms/step - loss: 5.6293e-09 - acc: 1.0000 -
val_loss: 0.5755 - val_acc: 0.9744
Epoch 1/30
8/8 [==============================] - 0s 12ms/step - loss: 5.9605e-09 - acc: 1.0000 -
val_loss: 0.5870 - val_acc: 0.9744
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.5839 - val_acc: 0.9744
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6491e-09 - acc: 1.0000 -
val_loss: 0.5874 - val_acc: 0.9744
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.5890 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.5918 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 4.6359e-09 - acc: 1.0000 -
val_loss: 0.5958 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.6126 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 6.2916e-09 - acc: 1.0000 -
val_loss: 0.6253 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 4.9671e-09 - acc: 1.0000 -
val_loss: 0.6050 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 6ms/step - loss: 7.6161e-09 - acc: 1.0000 -
val_loss: 0.6654 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 8.9407e-09 - acc: 1.0000 -
val_loss: 0.6113 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 1.7219e-08 - acc: 1.0000 -
val_loss: 0.7088 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0338 - acc: 0.9944 - val_
loss: 0.6629 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 5.4515e-06 - acc: 1.0000 -
val_loss: 0.6527 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 4.2484e-06 - acc: 1.0000 -
val_loss: 0.6446 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 10ms/step - loss: 3.0995e-06 - acc: 1.0000 -
val_loss: 0.6262 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 10ms/step - loss: 6.1983e-07 - acc: 1.0000 -
val_loss: 0.6197 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 9ms/step - loss: 5.8407e-07 - acc: 1.0000 -
val_loss: 0.6134 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 9ms/step - loss: 5.3640e-07 - acc: 1.0000 -
val_loss: 0.6089 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 4.6985e-07 - acc: 1.0000 -
val_loss: 0.6161 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 4.0231e-07 - acc: 1.0000 -
val_loss: 0.6010 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3675e-07 - acc: 1.0000 -
val_loss: 0.5951 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 2.7450e-07 - acc: 1.0000 -
val_loss: 0.5948 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 2.1258e-07 - acc: 1.0000 -
val_loss: 0.5844 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4934e-07 - acc: 1.0000 -
val_loss: 0.5761 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0596e-07 - acc: 1.0000 -
val_loss: 0.5719 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 7.4836e-08 - acc: 1.0000 -
val_loss: 0.5640 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 5.1326e-08 - acc: 1.0000 -
val_loss: 0.5740 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0596e-08 - acc: 1.0000 -
val_loss: 0.5691 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 7.6161e-09 - acc: 1.0000 -
val_loss: 0.5637 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 15ms/step - loss: 7.6161e-09 - acc: 1.0000 -
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val_loss: 0.5480 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-09 - acc: 1.0000 -
val_loss: 0.5531 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 6.2916e-09 - acc: 1.0000 -
val_loss: 0.5532 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 5.6293e-09 - acc: 1.0000 -
val_loss: 0.5464 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 8ms/step - loss: 4.9671e-09 - acc: 1.0000 -
val_loss: 0.5324 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 4.9671e-09 - acc: 1.0000 -
val_loss: 0.5387 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 4.3048e-09 - acc: 1.0000 -
val_loss: 0.5339 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 2.9802e-09 - acc: 1.0000 -
val_loss: 0.5316 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 2.3180e-09 - acc: 1.0000 -
val_loss: 0.5296 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 2.3180e-09 - acc: 1.0000 -
val_loss: 0.5335 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.5399 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 3.6425e-09 - acc: 1.0000 -
val_loss: 0.5549 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 3.6425e-09 - acc: 1.0000 -
val_loss: 0.5474 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 1.0265e-08 - acc: 1.0000 -
val_loss: 0.5550 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.5920 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.5708 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.5892 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 4.6359e-09 - acc: 1.0000 -
val_loss: 0.5831 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 5.9605e-09 - acc: 1.0000 -
val_loss: 0.5919 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 1.0596e-08 - acc: 1.0000 -
val_loss: 0.6284 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 9ms/step - loss: 1.5895e-08 - acc: 1.0000 -
val_loss: 0.5842 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 0.2082 - acc: 0.9639 - val_
loss: 0.8891 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3318e-05 - acc: 1.0000 -
val_loss: 0.9094 - val_acc: 0.8974
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 9.8869e-06 - acc: 1.0000 -
val_loss: 0.9359 - val_acc: 0.8974
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 8.2637e-06 - acc: 1.0000 -
val_loss: 0.9603 - val_acc: 0.8974
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 7.0497e-06 - acc: 1.0000 -
val_loss: 0.9764 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 5.9179e-06 - acc: 1.0000 -
val_loss: 0.9802 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 5.0863e-06 - acc: 1.0000 -
val_loss: 0.9815 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 4.1822e-06 - acc: 1.0000 -
val_loss: 0.9837 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 3.4790e-06 - acc: 1.0000 -
val_loss: 1.0023 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 2.3781e-06 - acc: 1.0000 -
val_loss: 1.0227 - val_acc: 0.8974
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6189e-06 - acc: 1.0000 -
val_loss: 1.0095 - val_acc: 0.8974
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3308e-06 - acc: 1.0000 -
val_loss: 0.9975 - val_acc: 0.8974
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 1.0341e-06 - acc: 1.0000 -
val_loss: 0.9716 - val_acc: 0.8974
Epoch 5/30
8/8 [==============================] - 0s 6ms/step - loss: 7.9041e-07 - acc: 1.0000 -
val_loss: 0.9901 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 5.7187e-07 - acc: 1.0000 -
val_loss: 0.9811 - val_acc: 0.8974
Epoch 7/30
8/8 [==============================] - 0s 6ms/step - loss: 4.0266e-07 - acc: 1.0000 -
val_loss: 0.9626 - val_acc: 0.8974
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 2.8809e-07 - acc: 1.0000 -
val_loss: 0.9496 - val_acc: 0.8974
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 2.0564e-07 - acc: 1.0000 -
val_loss: 0.9416 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 6ms/step - loss: 1.4636e-07 - acc: 1.0000 -
val_loss: 0.9236 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 1.0928e-07 - acc: 1.0000 -
val_loss: 0.9050 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 7.5168e-08 - acc: 1.0000 -
val_loss: 0.8895 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 6ms/step - loss: 5.5300e-08 - acc: 1.0000 -
val_loss: 0.8934 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 3.9405e-08 - acc: 1.0000 -
val_loss: 0.8749 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 2.5829e-08 - acc: 1.0000 -
val_loss: 0.8682 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 1.8875e-08 - acc: 1.0000 -
val_loss: 0.8412 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 1.2914e-08 - acc: 1.0000 -
val_loss: 0.8322 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 8.6096e-09 - acc: 1.0000 -
val_loss: 0.8346 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 6.9539e-09 - acc: 1.0000 -
val_loss: 0.8231 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 5.6293e-09 - acc: 1.0000 -
val_loss: 0.8154 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 9ms/step - loss: 4.3048e-09 - acc: 1.0000 -
val_loss: 0.8042 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 2.3180e-09 - acc: 1.0000 -
val_loss: 0.8257 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.8075 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.8033 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.8067 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3245e-09 - acc: 1.0000 -
val_loss: 0.7971 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-10 - acc: 1.0000 -
val_loss: 0.7915 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 3.6425e-09 - acc: 1.0000 -
val_loss: 0.7792 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6557e-09 - acc: 1.0000 -
val_loss: 0.8269 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 2.0199e-08 - acc: 1.0000 -
val_loss: 0.8123 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 2.3180e-09 - acc: 1.0000 -
val_loss: 0.8204 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6557e-09 - acc: 1.0000 -
val_loss: 0.8216 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4901e-08 - acc: 1.0000 -
val_loss: 0.7987 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3245e-09 - acc: 1.0000 -
val_loss: 0.7899 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 9ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.8088 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 4.9671e-09 - acc: 1.0000 -
val_loss: 0.7585 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 9ms/step - loss: 1.5232e-08 - acc: 1.0000 -
val_loss: 0.7910 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 10ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.7888 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 1.8382e-06 - acc: 1.0000 -
val_loss: 2.7895 - val_acc: 0.6410
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 0.1863 - acc: 0.9528 - val_
loss: 0.9203 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 3.4914e-05 - acc: 1.0000 -
val_loss: 0.9156 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 9ms/step - loss: 2.1553e-05 - acc: 1.0000 -
val_loss: 0.9139 - val_acc: 0.8974
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 1.4393e-05 - acc: 1.0000 -
val_loss: 0.9146 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 9.9578e-06 - acc: 1.0000 -
val_loss: 0.9164 - val_acc: 0.8974
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 7.2387e-06 - acc: 1.0000 -
val_loss: 0.9129 - val_acc: 0.8974
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 5.1276e-06 - acc: 1.0000 -
val_loss: 0.9200 - val_acc: 0.8974
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 3.8360e-06 - acc: 1.0000 -
val_loss: 0.9246 - val_acc: 0.8974
Epoch 18/30
8/8 [==============================] - 0s 9ms/step - loss: 2.6999e-06 - acc: 1.0000 -
val_loss: 0.8985 - val_acc: 0.8974
Epoch 19/30
8/8 [==============================] - 0s 10ms/step - loss: 2.0927e-06 - acc: 1.0000 -
val_loss: 0.9291 - val_acc: 0.8974
Epoch 20/30
8/8 [==============================] - 0s 9ms/step - loss: 1.6123e-06 - acc: 1.0000 -
val_loss: 0.8809 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3090e-06 - acc: 1.0000 -
val_loss: 0.9245 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 10ms/step - loss: 9.5730e-07 - acc: 1.0000 -
val_loss: 0.9003 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 9ms/step - loss: 7.3710e-07 - acc: 1.0000 -
val_loss: 0.8858 - val_acc: 0.8974
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 6.8909e-07 - acc: 1.0000 -
val_loss: 0.9143 - val_acc: 0.8974
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 4.1723e-07 - acc: 1.0000 -
val_loss: 0.8624 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-07 - acc: 1.0000 -
val_loss: 0.8936 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 10ms/step - loss: 2.2319e-07 - acc: 1.0000 -
val_loss: 0.9072 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 9ms/step - loss: 1.7318e-07 - acc: 1.0000 -
val_loss: 1.0404 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 9ms/step - loss: 1.7252e-07 - acc: 1.0000 -
val_loss: 0.9102 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 9ms/step - loss: 7.6824e-08 - acc: 1.0000 -
val_loss: 0.8775 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 5.8611e-08 - acc: 1.0000 -
val_loss: 0.8823 - val_acc: 0.8974
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 4.2717e-08 - acc: 1.0000 -
val_loss: 0.8856 - val_acc: 0.8974
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 3.1127e-08 - acc: 1.0000 -
val_loss: 0.8773 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 11ms/step - loss: 2.2848e-08 - acc: 1.0000 -
val_loss: 0.8799 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 10ms/step - loss: 1.6557e-08 - acc: 1.0000 -
val_loss: 0.9099 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0928e-08 - acc: 1.0000 -
val_loss: 0.8886 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 8.9407e-09 - acc: 1.0000 -
val_loss: 0.8676 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 4.6359e-09 - acc: 1.0000 -
val_loss: 0.8421 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 3.9736e-09 - acc: 1.0000 -
val_loss: 0.8471 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 2.9802e-09 - acc: 1.0000 -
val_loss: 0.8659 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 2.9802e-09 - acc: 1.0000 -
val_loss: 0.8836 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 2.6491e-09 - acc: 1.0000 -
val_loss: 0.9284 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.8698 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 2.3180e-09 - acc: 1.0000 -
val_loss: 0.8772 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.8844 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 3.6425e-09 - acc: 1.0000 -
val_loss: 0.8988 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 10ms/step - loss: 6.2916e-09 - acc: 1.0000 -
val_loss: 0.9694 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 2.2848e-08 - acc: 1.0000 -
val_loss: 0.8642 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0714 - acc: 0.9861 - val_
loss: 1.7892 - val_acc: 0.8205
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0136 - acc: 0.9944 - val_
loss: 1.1501 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 5ms/step - loss: 1.3105e-05 - acc: 1.0000 -
val_loss: 1.1125 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 7.9804e-06 - acc: 1.0000 -
val_loss: 1.1099 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 5ms/step - loss: 6.2294e-06 - acc: 1.0000 -
val_loss: 1.0942 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 4.7728e-06 - acc: 1.0000 -
val_loss: 1.0960 - val_acc: 0.8974
Epoch 25/30
8/8 [==============================] - 0s 9ms/step - loss: 3.4842e-06 - acc: 1.0000 -
val_loss: 1.1181 - val_acc: 0.8974
Epoch 26/30
8/8 [==============================] - 0s 10ms/step - loss: 2.5655e-06 - acc: 1.0000 -
val_loss: 1.0932 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9056e-06 - acc: 1.0000 -
val_loss: 1.0886 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3834e-06 - acc: 1.0000 -
val_loss: 1.0962 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 9.3445e-07 - acc: 1.0000 -
val_loss: 1.0773 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 4.9438e-07 - acc: 1.0000 -
val_loss: 1.0807 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 3.8080e-07 - acc: 1.0000 -
val_loss: 1.0696 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 2.8080e-07 - acc: 1.0000 -
val_loss: 1.0643 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 2.0497e-07 - acc: 1.0000 -
val_loss: 1.0610 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 10ms/step - loss: 1.4769e-07 - acc: 1.0000 -
val_loss: 1.0751 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0464e-07 - acc: 1.0000 -
val_loss: 1.0401 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 9ms/step - loss: 6.6227e-08 - acc: 1.0000 -
val_loss: 1.0395 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 4.9008e-08 - acc: 1.0000 -
val_loss: 1.0488 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 9ms/step - loss: 3.4438e-08 - acc: 1.0000 -
val_loss: 1.0404 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 11ms/step - loss: 2.3511e-08 - acc: 1.0000 -
val_loss: 1.0413 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 11ms/step - loss: 1.7219e-08 - acc: 1.0000 -
val_loss: 1.0232 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0596e-08 - acc: 1.0000 -
val_loss: 1.0038 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 10ms/step - loss: 7.2850e-09 - acc: 1.0000 -
val_loss: 0.9840 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 5.2982e-09 - acc: 1.0000 -
val_loss: 0.9744 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 3.9736e-09 - acc: 1.0000 -
val_loss: 0.9654 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 2.6491e-09 - acc: 1.0000 -
val_loss: 0.9448 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 9ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.9383 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 10ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.9345 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-10 - acc: 1.0000 -
val_loss: 0.9331 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9242 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9235 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9061 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9200 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.8312 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6557e-09 - acc: 1.0000 -
val_loss: 0.8697 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
val_loss: 0.8663 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.8784 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.9535 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 6ms/step - loss: 0.8076 - acc: 0.9417 - val_
loss: 1.3025 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3883e-04 - acc: 1.0000 -
val_loss: 1.2610 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 6.1743e-05 - acc: 1.0000 -
val_loss: 1.2349 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 10ms/step - loss: 3.7089e-05 - acc: 1.0000 -
val_loss: 1.2140 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 2.4044e-05 - acc: 1.0000 -
val_loss: 1.1949 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6044e-05 - acc: 1.0000 -
val_loss: 1.1790 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 1.1008e-05 - acc: 1.0000 -
val_loss: 1.1617 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 7.3432e-06 - acc: 1.0000 -
val_loss: 1.1448 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 4.9612e-06 - acc: 1.0000 -
val_loss: 1.1307 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 3.4796e-06 - acc: 1.0000 -
val_loss: 1.1161 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 2.4317e-06 - acc: 1.0000 -
val_loss: 1.1032 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6924e-06 - acc: 1.0000 -
val_loss: 1.0892 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1546e-06 - acc: 1.0000 -
val_loss: 1.0772 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 8.2286e-07 - acc: 1.0000 -
val_loss: 1.0669 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 5.8313e-07 - acc: 1.0000 -
val_loss: 1.0565 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 4.1160e-07 - acc: 1.0000 -
val_loss: 1.0465 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 2.8676e-07 - acc: 1.0000 -
val_loss: 1.0351 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 1.9703e-07 - acc: 1.0000 -
val_loss: 1.0261 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 11ms/step - loss: 1.4173e-07 - acc: 1.0000 -
val_loss: 1.0182 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 10ms/step - loss: 1.0000e-07 - acc: 1.0000 -
val_loss: 1.0018 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 10ms/step - loss: 6.2254e-08 - acc: 1.0000 -
val_loss: 1.0001 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 4.6690e-08 - acc: 1.0000 -
val_loss: 0.9971 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 9ms/step - loss: 3.4107e-08 - acc: 1.0000 -
val_loss: 0.9705 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 2.1855e-08 - acc: 1.0000 -
val_loss: 0.9726 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6557e-08 - acc: 1.0000 -
val_loss: 0.9744 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2914e-08 - acc: 1.0000 -
val_loss: 0.9605 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 8.2784e-09 - acc: 1.0000 -
val_loss: 0.9630 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 5.9605e-09 - acc: 1.0000 -
val_loss: 0.9623 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 7ms/step - loss: 4.9671e-09 - acc: 1.0000 -
val_loss: 0.9567 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 6ms/step - loss: 2.3180e-09 - acc: 1.0000 -
val_loss: 0.9544 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.9464 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.9364 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6227e-10 - acc: 1.0000 -
val_loss: 0.9303 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 14ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.9205 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.9428 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9271 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
val_loss: 0.9307 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 9ms/step - loss: 6.6227e-10 - acc: 1.0000 -
val_loss: 0.8960 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
val_loss: 0.8986 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 9ms/step - loss: 1.6557e-09 - acc: 1.0000 -
val_loss: 0.8027 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-09 - acc: 1.0000 -
val_loss: 0.8543 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.8339 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3245e-09 - acc: 1.0000 -
val_loss: 0.7623 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0549 - acc: 0.9917 - val_
loss: 1.8513 - val_acc: 0.8718
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 0.1855 - acc: 0.9611 - val_
loss: 1.1903 - val_acc: 0.8718
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0927e-05 - acc: 1.0000 -
val_loss: 1.1061 - val_acc: 0.8718
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6815e-06 - acc: 1.0000 -
val_loss: 1.1222 - val_acc: 0.8718
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 5.6051e-06 - acc: 1.0000 -
val_loss: 1.1087 - val_acc: 0.8718
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 4.6168e-06 - acc: 1.0000 -
val_loss: 1.0918 - val_acc: 0.8974
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 3.7810e-06 - acc: 1.0000 -
val_loss: 1.0582 - val_acc: 0.8974
Epoch 18/30
8/8 [==============================] - 0s 9ms/step - loss: 3.0833e-06 - acc: 1.0000 -
val_loss: 1.0477 - val_acc: 0.8974
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 2.4265e-06 - acc: 1.0000 -
val_loss: 1.0184 - val_acc: 0.8974
Epoch 20/30
8/8 [==============================] - 0s 10ms/step - loss: 1.9353e-06 - acc: 1.0000 -
val_loss: 1.0094 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 9ms/step - loss: 1.5244e-06 - acc: 1.0000 -
val_loss: 0.9752 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3162e-06 - acc: 1.0000 -
val_loss: 1.0523 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 8.7482e-07 - acc: 1.0000 -
val_loss: 1.0481 - val_acc: 0.8974
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 6.4570e-07 - acc: 1.0000 -
val_loss: 1.0282 - val_acc: 0.8974
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 4.9040e-07 - acc: 1.0000 -
val_loss: 1.0222 - val_acc: 0.8974
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 3.6193e-07 - acc: 1.0000 -
val_loss: 0.9936 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 6ms/step - loss: 2.6160e-07 - acc: 1.0000 -
val_loss: 0.9998 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 1.8477e-07 - acc: 1.0000 -
val_loss: 1.0379 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3212e-07 - acc: 1.0000 -
val_loss: 0.9884 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 9.0400e-08 - acc: 1.0000 -
val_loss: 1.0050 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 11ms/step - loss: 6.3909e-08 - acc: 1.0000 -
val_loss: 0.9997 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 4.4703e-08 - acc: 1.0000 -
val_loss: 0.9847 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 3.2120e-08 - acc: 1.0000 -
val_loss: 0.9587 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 2.4835e-08 - acc: 1.0000 -
val_loss: 1.0211 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6557e-08 - acc: 1.0000 -
val_loss: 0.9773 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 10ms/step - loss: 1.0928e-08 - acc: 1.0000 -
val_loss: 0.9750 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 7.9473e-09 - acc: 1.0000 -
val_loss: 0.9568 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 4.9671e-09 - acc: 1.0000 -
val_loss: 0.9750 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 2.6491e-09 - acc: 1.0000 -
val_loss: 0.9687 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 1.9868e-09 - acc: 1.0000 -
val_loss: 0.9545 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6557e-09 - acc: 1.0000 -
val_loss: 0.9543 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9503 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9461 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
val_loss: 0.9369 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9301 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-10 - acc: 1.0000 -
val_loss: 0.9077 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9153 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9285 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9194 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.8857 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
val_loss: 0.9179 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 10ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.8572 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 9.9341e-10 - acc: 1.0000 -
val_loss: 0.8890 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 9ms/step - loss: 1.3245e-09 - acc: 1.0000 -
val_loss: 0.8671 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 9ms/step - loss: 6.6227e-10 - acc: 1.0000 -
val_loss: 0.8538 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 4.9671e-09 - acc: 1.0000 -
val_loss: 0.7951 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 9ms/step - loss: 3.4438e-08 - acc: 1.0000 -
val_loss: 3.7108 - val_acc: 0.7692
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 0.6730 - acc: 0.9278 - val_
loss: 1.6485 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6536e-05 - acc: 1.0000 -
val_loss: 1.6380 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 2.1365e-05 - acc: 1.0000 -
val_loss: 1.6284 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 11ms/step - loss: 1.7193e-05 - acc: 1.0000 -
val_loss: 1.6189 - val_acc: 0.8974
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3486e-05 - acc: 1.0000 -
val_loss: 1.6080 - val_acc: 0.8974
Epoch 3/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0579e-05 - acc: 1.0000 -
val_loss: 1.5962 - val_acc: 0.8974
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 8.4293e-06 - acc: 1.0000 -
val_loss: 1.5823 - val_acc: 0.8974
Epoch 5/30
8/8 [==============================] - 0s 8ms/step - loss: 6.2480e-06 - acc: 1.0000 -
val_loss: 1.5682 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 9ms/step - loss: 4.6206e-06 - acc: 1.0000 -
val_loss: 1.5531 - val_acc: 0.8974
Epoch 7/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3130e-06 - acc: 1.0000 -
val_loss: 1.5347 - val_acc: 0.8974
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 2.2817e-06 - acc: 1.0000 -
val_loss: 1.5192 - val_acc: 0.8974
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6824e-06 - acc: 1.0000 -
val_loss: 1.5028 - val_acc: 0.8974
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2315e-06 - acc: 1.0000 -
val_loss: 1.4859 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 8.6259e-07 - acc: 1.0000 -
val_loss: 1.4671 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 6.1359e-07 - acc: 1.0000 -
val_loss: 1.4486 - val_acc: 0.8974
Epoch 13/30
8/8 [==============================] - 0s 6ms/step - loss: 4.2915e-07 - acc: 1.0000 -
val_loss: 1.4162 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 6ms/step - loss: 2.6789e-07 - acc: 1.0000 -
val_loss: 1.3865 - val_acc: 0.8974
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 1.7683e-07 - acc: 1.0000 -
val_loss: 1.3726 - val_acc: 0.8974
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2550e-07 - acc: 1.0000 -
 val_loss: 1.3595 - val_acc: 0.8974
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 8.8082e-08 - acc: 1.0000 -
 val_loss: 1.3455 - val_acc: 0.8974
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 6.3909e-08 - acc: 1.0000 -
 val_loss: 1.3307 - val_acc: 0.8974
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 4.6690e-08 - acc: 1.0000 -
 val_loss: 1.3165 - val_acc: 0.8974
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 3.1789e-08 - acc: 1.0000 -
 val_loss: 1.2982 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 9ms/step - loss: 2.2186e-08 - acc: 1.0000 -
 val_loss: 1.2743 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4239e-08 - acc: 1.0000 -
 val_loss: 1.2599 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 9.2718e-09 - acc: 1.0000 -
 val_loss: 1.2483 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 10ms/step - loss: 5.9605e-09 - acc: 1.0000 -
 val_loss: 1.2426 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 10ms/step - loss: 4.3048e-09 - acc: 1.0000 -
 val_loss: 1.2233 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 11ms/step - loss: 1.9868e-09 - acc: 1.0000 -
 val_loss: 1.2102 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 9ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 1.1962 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 1.1660 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1572 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.1314 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 14ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1292 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1189 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0835 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0604 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.0471 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0063 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0382 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.0044 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0241 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6557e-09 - acc: 1.0000 -
 val_loss: 1.0100 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 1.0198 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 1.9868e-09 - acc: 1.0000 -
 val_loss: 0.9530 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 0.6045 - acc: 0.9472 - val_
loss: 0.8275 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0043 - acc: 0.9972 - val_
loss: 0.9178 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 1.8362e-05 - acc: 1.0000 -
 val_loss: 0.9323 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3192e-05 - acc: 1.0000 -
 val_loss: 0.9445 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 9.8025e-06 - acc: 1.0000 -
 val_loss: 0.9566 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 7.1054e-06 - acc: 1.0000 -
 val_loss: 0.9698 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 5.0356e-06 - acc: 1.0000 -
 val_loss: 0.9828 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 3.7062e-06 - acc: 1.0000 -
 val_loss: 0.9967 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 2.5993e-06 - acc: 1.0000 -
 val_loss: 1.0100 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 1.7578e-06 - acc: 1.0000 -
 val_loss: 1.0219 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 1.2394e-06 - acc: 1.0000 -
 val_loss: 1.0523 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 8.4668e-07 - acc: 1.0000 -
 val_loss: 1.0695 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 3.2584e-07 - acc: 1.0000 -
 val_loss: 1.0703 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 10ms/step - loss: 2.5829e-07 - acc: 1.0000 -
 val_loss: 1.0715 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 9ms/step - loss: 2.0398e-07 - acc: 1.0000 -
 val_loss: 1.0742 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6325e-07 - acc: 1.0000 -
 val_loss: 1.0784 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 1.2451e-07 - acc: 1.0000 -
 val_loss: 1.0822 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 9.2387e-08 - acc: 1.0000 -
 val_loss: 1.0845 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 15ms/step - loss: 6.9870e-08 - acc: 1.0000 -
 val_loss: 1.0908 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 5.1326e-08 - acc: 1.0000 -
 val_loss: 1.1063 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 3.8412e-08 - acc: 1.0000 -
 val_loss: 1.1186 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 2.6822e-08 - acc: 1.0000 -
 val_loss: 1.1284 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 6ms/step - loss: 1.9206e-08 - acc: 1.0000 -
 val_loss: 1.1386 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3908e-08 - acc: 1.0000 -
 val_loss: 1.1542 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 6ms/step - loss: 1.0265e-08 - acc: 1.0000 -
 val_loss: 1.1368 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6227e-09 - acc: 1.0000 -
 val_loss: 1.1500 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 3.9736e-09 - acc: 1.0000 -
 val_loss: 1.1701 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 2.3180e-09 - acc: 1.0000 -
 val_loss: 1.1796 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 1.1822 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.1855 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.1891 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.1969 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.1959 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2080 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.2052 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2250 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.2262 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2385 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
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val_loss: 1.2040 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 5ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.2518 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 2.3180e-09 - acc: 1.0000 - val_loss: 1.2041 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 4ms/step - loss: 9.0730e-08 - acc: 1.0000 - val_loss: 3.8692 - val_acc: 0.7692
Epoch 25/30
8/8 [==============================] - 0s 5ms/step - loss: 0.1364 - acc: 0.9778 - val_loss: 1.4592 - val_acc: 0.8718
Epoch 26/30
8/8 [==============================] - 0s 5ms/step - loss: 4.2795e-05 - acc: 1.0000 - val_loss: 1.4023 - val_acc: 0.8718
Epoch 27/30
8/8 [==============================] - 0s 4ms/step - loss: 2.0980e-05 - acc: 1.0000 - val_loss: 1.3680 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3201e-05 - acc: 1.0000 - val_loss: 1.3363 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 4ms/step - loss: 8.3861e-06 - acc: 1.0000 - val_loss: 1.3046 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 4ms/step - loss: 5.1813e-06 - acc: 1.0000 - val_loss: 1.2811 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 16ms/step - loss: 3.7567e-06 - acc: 1.0000 - val_loss: 1.2588 - val_acc: 0.8974
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 2.6714e-06 - acc: 1.0000 - val_loss: 1.2312 - val_acc: 0.8974
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 1.7834e-06 - acc: 1.0000 - val_loss: 1.2073 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2536e-06 - acc: 1.0000 - val_loss: 1.1855 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 8.8677e-07 - acc: 1.0000 - val_loss: 1.1444 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 5.6789e-07 - acc: 1.0000 - val_loss: 1.1276 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 4.0465e-07 - acc: 1.0000 - val_loss: 1.1107 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 2.8445e-07 - acc: 1.0000 - val_loss: 1.0819 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 1.8974e-07 - acc: 1.0000 - val_loss: 1.0677 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 13ms/step - loss: 1.3345e-07 - acc: 1.0000 - val_loss: 1.0586 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 9ms/step - loss: 9.6361e-08 - acc: 1.0000 - val_loss: 1.0458 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 6.1591e-08 - acc: 1.0000 - val_loss: 1.0417 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 4.5035e-08 - acc: 1.0000 - val_loss: 1.0354 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 6ms/step - loss: 3.1789e-08 - acc: 1.0000 - val_loss: 1.0161 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 2.1855e-08 - acc: 1.0000 - val_loss: 1.0279 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 1.5563e-08 - acc: 1.0000 - val_loss: 1.0223 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 1.0596e-08 - acc: 1.0000 - val_loss: 1.0250 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - ETA: 0s - loss: 2.3842e-09 - acc: 1.000 - 0s 5ms/step - loss: 6.6227e-09 - acc: 1.0000 - val_loss: 1.0299 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 4.3048e-09 - acc: 1.0000 - val_loss: 1.0345 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 3.6425e-09 - acc: 1.0000 - val_loss: 1.0289 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 10ms/step - loss: 2.3180e-09 - acc: 1.0000 - val_loss: 1.0425 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6557e-09 - acc: 1.0000 - val_loss: 1.0291 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.0554 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.0383 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.0288 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.0178 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0202 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0227 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0257 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0316 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 15ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.0342 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 11ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.0075 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 11ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0112 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0111 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0194 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0287 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0379 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0461 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0503 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.0542 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 9ms/step - loss: 9.9341e-10 - acc: 1.0000 - val_loss: 0.9643 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 9ms/step - loss: 1.6557e-09 - acc: 1.0000 - val_loss: 0.9854 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 0.9952 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0073 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 0.9960 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0928e-08 - acc: 1.0000 - val_loss: 2.2725 - val_acc: 0.8718
Epoch 17/30
8/8 [==============================] - 0s 13ms/step - loss: 0.1531 - acc: 0.9778 - val_loss: 0.9569 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 10ms/step - loss: 2.5644e-05 - acc: 1.0000 - val_loss: 1.0087 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 6ms/step - loss: 4.1975e-06 - acc: 1.0000 - val_loss: 1.0045 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3386e-06 - acc: 1.0000 - val_loss: 1.0073 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 2.8544e-06 - acc: 1.0000 - val_loss: 0.9999 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 2.4298e-06 - acc: 1.0000 - val_loss: 0.9974 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 11ms/step - loss: 1.9857e-06 - acc: 1.0000 - val_loss: 0.9989 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 10ms/step - loss: 1.5673e-06 - acc: 1.0000 - val_loss: 1.0053 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 10ms/step - loss: 1.1986e-06 - acc: 1.0000 - val_loss: 1.0118 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 10ms/step - loss: 8.5725e-07 - acc: 1.0000 - val_loss: 1.0211 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 9ms/step - loss: 5.9469e-07 - acc: 1.0000 - val_loss: 1.0238 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 4.2748e-07 - acc: 1.0000 - val_loss: 1.0356 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 3.0067e-07 - acc: 1.0000 - val_loss: 1.0345 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 2.2385e-07 - acc: 1.0000 - val_loss: 1.0474 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 1.6325e-07 - acc: 1.0000 - val_loss: 1.0112 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 9ms/step - loss: 1.4272e-07 - acc: 1.0000 - val_loss: 1.0455 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 5.6293e-08 - acc: 1.0000 - val_loss: 1.0610 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 3.8081e-08 - acc: 1.0000 - val_loss: 1.0586 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6822e-08 - acc: 1.0000 - val_loss: 1.0551 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 2.0530e-08 - acc: 1.0000 - val_loss: 1.0749 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4901e-08 - acc: 1.0000 - val_loss: 1.0718 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1590e-08 - acc: 1.0000 - val_loss: 1.0689 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 6.9539e-09 - acc: 1.0000 - val_loss: 1.0918 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 5.9605e-09 - acc: 1.0000 - val_loss: 1.0770 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 9ms/step - loss: 3.6425e-09 - acc: 1.0000 - val_loss: 1.0643 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 2.3180e-09 - acc: 1.0000 - val_loss: 1.0577 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6557e-09 - acc: 1.0000 - val_loss: 1.0485 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 5ms/step - loss: 9.9341e-10 - acc: 1.0000 - val_loss: 1.0458 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.0398 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0456 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0495 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 11ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0426 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 11ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0397 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0394 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0391 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0387 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0471 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0465 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0468 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0468 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0468 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0407 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0425 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0438 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 35ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0462 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0485 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0554 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0571 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0575 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0638 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0671 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0663 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0689 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0728 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0885 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.0650 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 9ms/step - loss: 9.9341e-10 - acc: 1.0000 - val_loss: 1.0405 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 9ms/step - loss: 0.5823 - acc: 0.9444 - val_loss: 1.5205 - val_acc: 0.8974
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 9.7881e-05 - acc: 1.0000 - val_loss: 1.4960 - val_acc: 0.8974
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 3.2347e-05 - acc: 1.0000 - val_loss: 1.4855 - val_acc: 0.8974
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9939e-05 - acc: 1.0000 - val_loss: 1.4759 - val_acc: 0.8974
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 1.3134e-05 - acc: 1.0000 - val_loss: 1.4665 - val_acc: 0.8974
Epoch 19/30
8/8 [==============================] - 0s 9ms/step - loss: 8.3827e-06 - acc: 1.0000 - val_loss: 1.4573 - val_acc: 0.8974
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 5.7526e-06 - acc: 1.0000 - val_loss: 1.4444 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 3.6993e-06 - acc: 1.0000 - val_loss: 1.4343 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 2.6017e-06 - acc: 1.0000 - val_loss: 1.4242 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 1.8625e-06 - acc: 1.0000 - val_loss: 1.4139 - val_acc: 0.8974
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 1.2884e-06 - acc: 1.0000 - val_loss: 1.4026 - val_acc: 0.8974
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 9.1456e-07 - acc: 1.0000 - val_loss: 1.3895 - val_acc: 0.8974
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 6.2385e-07 - acc: 1.0000 - val_loss: 1.3741 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 4.3743e-07 - acc: 1.0000 - val_loss: 1.3561 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 2.8974e-07 - acc: 1.0000 - val_loss: 1.3379 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 2.1524e-07 - acc: 1.0000 - val_loss: 1.3223 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 1.5000e-07 - acc: 1.0000 - val_loss: 1.3027 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 17ms/step - loss: 1.0133e-07 - acc: 1.0000 - val_loss: 1.2857 - val_acc: 0.8974
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 6.7883e-08 - acc: 1.0000 - val_loss: 1.2561 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 4.0067e-08 - acc: 1.0000 - val_loss: 1.2464 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 21ms/step - loss: 3.0133e-08 - acc: 1.0000 - val_loss: 1.2295 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 11ms/step - loss: 2.0862e-08 - acc: 1.0000 - val_loss: 1.2228 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 1.5232e-08 - acc: 1.0000 - val_loss: 1.2126 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 12ms/step - loss: 1.0928e-08 - acc: 1.0000 - val_loss: 1.2009 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 12ms/step - loss: 6.6227e-09 - acc: 1.0000 - val_loss: 1.1818 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 11ms/step - loss: 5.6293e-09 - acc: 1.0000 - val_loss: 1.1738 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 3.9736e-09 - acc: 1.0000 - val_loss: 1.1688 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 14ms/step - loss: 1.9868e-09 - acc: 1.0000 - val_loss: 1.1616 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 - val_loss: 1.1585 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.1559 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 11ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.1555 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1457 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1355 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1274 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1202 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1133 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1092 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1055 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1035 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1021 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1014 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1027 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1035 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1045 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1021 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1029 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1022 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 15ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.0997 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1023 - val_acc: 0.8974
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1079 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 5ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.1218 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3908e-08 - acc: 1.0000 - val_loss: 1.0074 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 5ms/step - loss: 0.3923 - acc: 0.9667 - val_loss: 0.9240 - val_acc: 0.8974
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0054 - acc: 0.9972 - val_loss: 1.5225 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 3.4380e-05 - acc: 1.0000 - val_loss: 1.4948 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 1.0497e-05 - acc: 1.0000 - val_loss: 1.4862 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 6.7998e-06 - acc: 1.0000 - val_loss: 1.4765 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 4.0127e-06 - acc: 1.0000 - val_loss: 1.4678 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 2.5349e-06 - acc: 1.0000 - val_loss: 1.4578 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6613e-06 - acc: 1.0000 - val_loss: 1.4483 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 1.1108e-06 - acc: 1.0000 - val_loss: 1.4372 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 10ms/step - loss: 7.0592e-07 - acc: 1.0000 - val_loss: 1.4254 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 9ms/step - loss: 4.7251e-07 - acc: 1.0000 - val_loss: 1.4146 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 9ms/step - loss: 3.4271e-07 - acc: 1.0000 - val_loss: 1.4023 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 2.2451e-07 - acc: 1.0000 - val_loss: 1.3909 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 1.5365e-07 - acc: 1.0000 - val_loss: 1.3778 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 1.0828e-07 - acc: 1.0000 - val_loss: 1.3618 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 6.5896e-08 - acc: 1.0000 - val_loss: 1.3485 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 4.5366e-08 - acc: 1.0000 - val_loss: 1.3370 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 10ms/step - loss: 3.2451e-08 - acc: 1.0000 - val_loss: 1.3239 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 10ms/step - loss: 2.2848e-08 - acc: 1.0000 - val_loss: 1.3114 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 10ms/step - loss: 1.5232e-08 - acc: 1.0000 - val_loss: 1.2983 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 1.1259e-08 - acc: 1.0000 - val_loss: 1.2865 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 6.9539e-09 - acc: 1.0000 - val_loss: 1.2767 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 9ms/step - loss: 5.2982e-09 - acc: 1.0000 - val_loss: 1.2659 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 9ms/step - loss: 3.9736e-09 - acc: 1.0000 - val_loss: 1.2561 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 2.3180e-09 - acc: 1.0000 - val_loss: 1.2487 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 12ms/step - loss: 1.6557e-09 - acc: 1.0000 - val_loss: 1.2401 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6557e-09 - acc: 1.0000 - val_loss: 1.2315 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 - val_loss: 1.2227 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.2123 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 10ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.2059 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2044 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2044 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2031 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2025 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2022 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1973 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1979 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1995 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2003 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1993 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1991 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1959 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1944 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1933 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1921 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.1984 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 11ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2010 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2019 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2130 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2161 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2231 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2287 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2412 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.2521 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2417 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 17ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.2547 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.2032 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6491e-09 - acc: 1.0000 - val_loss: 1.1801 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.1681 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.2125 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 2.9802e-09 - acc: 1.0000 - val_loss: 1.1690 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 10ms/step - loss: 1.3245e-09 - acc: 1.0000 - val_loss: 1.1102 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.1495 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 2.3180e-09 - acc: 1.0000 - val_loss: 1.1054 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 0.8115 - acc: 0.9361 - val_loss: 1.5588 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0043 - acc: 0.9972 - val_loss: 1.1911 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 1.8824e-05 - acc: 1.0000 - val_loss: 1.3875 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 1.4528e-05 - acc: 1.0000 - val_loss: 1.3750 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 9ms/step - loss: 1.1230e-05 - acc: 1.0000 - val_loss: 1.3639 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 8.6593e-06 - acc: 1.0000 - val_loss: 1.3573 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 6.4333e-06 - acc: 1.0000 - val_loss: 1.3592 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 4.8352e-06 - acc: 1.0000 - val_loss: 1.3512 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 3.5596e-06 - acc: 1.0000 - val_loss: 1.3391 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 2.7445e-06 - acc: 1.0000 - val_loss: 1.3743 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 2.0874e-06 - acc: 1.0000 - val_loss: 1.3451 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6265e-06 - acc: 1.0000 - val_loss: 1.3471 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 1.2116e-06 - acc: 1.0000 - val_loss: 1.3696 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 9.3279e-07 - acc: 1.0000 - val_loss: 1.3188 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 6.7716e-07 - acc: 1.0000 - val_loss: 1.3606 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 8ms/step - loss: 5.0266e-07 - acc: 1.0000 - val_loss: 1.3708 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 3.6723e-07 - acc: 1.0000 - val_loss: 1.3760 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 6ms/step - loss: 2.5762e-07 - acc: 1.0000 - val_loss: 1.3794 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 1.8014e-07 - acc: 1.0000 - val_loss: 1.3828 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 9ms/step - loss: 1.6722e-07 - acc: 1.0000 - val_loss: 1.3534 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 10ms/step - loss: 6.7552e-08 - acc: 1.0000 - val_loss: 1.3527 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 12ms/step - loss: 5.0002e-08 - acc: 1.0000 - val_loss: 1.3506 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 3.6425e-08 - acc: 1.0000 - val_loss: 1.3482 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 2.4504e-08 - acc: 1.0000 - val_loss: 1.3437 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 1.5895e-08 - acc: 1.0000 - val_loss: 1.3403 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 6ms/step - loss: 1.2914e-08 - acc: 1.0000 - val_loss: 1.3369 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 8.9407e-09 - acc: 1.0000 - val_loss: 1.3479 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 5.6293e-09 - acc: 1.0000 - val_loss: 1.3258 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 2.9802e-09 - acc: 1.0000 - val_loss: 1.3251 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 1.9868e-09 - acc: 1.0000 - val_loss: 1.3209 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 1.6557e-09 - acc: 1.0000 - val_loss: 1.3197 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.3170 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 - val_loss: 1.3192 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.3144 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.3084 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.3023 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.2780 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2884 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2831 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.2604 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 0.3414 - acc: 0.9583 - val_loss: 1.7359 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0126 - acc: 0.9944 - val_loss: 1.5315 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 4.2054e-08 - acc: 1.0000 - val_loss: 1.5318 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 3.7750e-08 - acc: 1.0000 - val_loss: 1.5320 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 3.4769e-08 - acc: 1.0000 - val_loss: 1.5321 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 3.2120e-08 - acc: 1.0000 - val_loss: 1.5323 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 3.0465e-08 - acc: 1.0000 - val_loss: 1.5323 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 2.9140e-08 - acc: 1.0000 - val_loss: 1.5322 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 2.7484e-08 - acc: 1.0000 - val_loss: 1.5320 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 2.5498e-08 - acc: 1.0000 - val_loss: 1.5316 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 2.4504e-08 - acc: 1.0000 - val_loss: 1.5309 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 14ms/step - loss: 2.2517e-08 - acc: 1.0000 - val_loss: 1.5298 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 2.1193e-08 - acc: 1.0000 - val_loss: 1.5282 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 1.9206e-08 - acc: 1.0000 - val_loss: 1.5258 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 1.7550e-08 - acc: 1.0000 - val_loss: 1.5229 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6888e-08 - acc: 1.0000 - val_loss: 1.5190 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 1.4901e-08 - acc: 1.0000 - val_loss: 1.5145 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 9ms/step - loss: 1.3908e-08 - acc: 1.0000 - val_loss: 1.5086 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0928e-08 - acc: 1.0000 - val_loss: 1.5023 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0596e-08 - acc: 1.0000 - val_loss: 1.4944 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 9.2718e-09 - acc: 1.0000 - val_loss: 1.4838 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 7.2850e-09 - acc: 1.0000 - val_loss: 1.4732 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-09 - acc: 1.0000 - val_loss: 1.4601 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 6ms/step - loss: 4.9671e-09 - acc: 1.0000 - val_loss: 1.4460 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 3.9736e-09 - acc: 1.0000 - val_loss: 1.4330 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 6ms/step - loss: 2.9802e-09 - acc: 1.0000 - val_loss: 1.4142 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 2.3180e-09 - acc: 1.0000 - val_loss: 1.3939 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3245e-09 - acc: 1.0000 - val_loss: 1.3819 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-10 - acc: 1.0000 - val_loss: 1.3636 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 5ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.3537 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 4ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.3439 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 5ms/step - loss: 3.3114e-10 - acc: 1.0000 - val_loss: 1.3388 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 4ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.3291 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 4ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.3173 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 4ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2957 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2917 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 4ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2879 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 4ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2842 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2855 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2826 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2790 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2775 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2758 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2738 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2709 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2686 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2676 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2661 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2637 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2629 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 - val_loss: 1.2629 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
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 val_loss: 1.2634 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2643 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2571 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2686 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.2751 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2672 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2589 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.2522 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.1808 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1831 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 6ms/step - loss: 2.6491e-09 - acc: 1.0000 -
 val_loss: 1.1530 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 9ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.0795 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 10ms/step - loss: 0.4234 - acc: 0.9694 - val
_loss: 1.9479 - val_acc: 0.8718
Epoch 24/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0015 - acc: 1.0000 - val_
loss: 1.0841 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 1.9125e-06 - acc: 1.0000 -
 val_loss: 1.0841 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 1.4172e-06 - acc: 1.0000 -
 val_loss: 1.0839 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2662e-06 - acc: 1.0000 -
 val_loss: 1.0837 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 1.1268e-06 - acc: 1.0000 -
 val_loss: 1.0836 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0175e-06 - acc: 1.0000 -
 val_loss: 1.0858 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 9ms/step - loss: 1.4821e-06 - acc: 1.0000 -
 val_loss: 1.0861 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 15ms/step - loss: 7.2021e-07 - acc: 1.0000 -
 val_loss: 1.0866 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 5.5266e-07 - acc: 1.0000 -
 val_loss: 1.0874 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 4.5564e-07 - acc: 1.0000 -
 val_loss: 1.0866 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 3.4901e-07 - acc: 1.0000 -
 val_loss: 1.0866 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6226e-07 - acc: 1.0000 -
 val_loss: 1.0873 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 6ms/step - loss: 2.5862e-07 - acc: 1.0000 -
 val_loss: 1.0861 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 1.8246e-07 - acc: 1.0000 -
 val_loss: 1.0891 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 2.1756e-07 - acc: 1.0000 -
 val_loss: 1.0957 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 8.1791e-08 - acc: 1.0000 -
 val_loss: 1.0957 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 5.6955e-08 - acc: 1.0000 -
 val_loss: 1.0923 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 3.9074e-08 - acc: 1.0000 -
 val_loss: 1.0907 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 3.1789e-08 - acc: 1.0000 -
 val_loss: 1.0825 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 2.3511e-08 - acc: 1.0000 -
 val_loss: 1.0797 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 1.7550e-08 - acc: 1.0000 -
 val_loss: 1.0809 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4901e-08 - acc: 1.0000 -
 val_loss: 1.0956 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-09 - acc: 1.0000 -
 val_loss: 1.0834 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 9.6030e-09 - acc: 1.0000 -
 val_loss: 1.0795 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 4.3048e-09 - acc: 1.0000 -
 val_loss: 1.0732 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 6ms/step - loss: 2.3180e-09 - acc: 1.0000 -
 val_loss: 1.0703 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6557e-09 - acc: 1.0000 -
 val_loss: 1.0569 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 1.0541 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.0411 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 1.0318 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 5ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 1.0262 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0146 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0024 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9956 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9882 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9889 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9961 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 12ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9825 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9755 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9700 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9691 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9661 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9691 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9676 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9915 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9983 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9939 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0052 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0076 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0085 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0057 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0131 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0112 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0100 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0089 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0067 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0060 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0052 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0056 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0081 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0126 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0180 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0266 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0905 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 6ms/step - loss: 0.5799 - acc: 0.9528 - val_
loss: 1.5697 - val_acc: 0.8462
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0249 - acc: 0.9889 - val_
loss: 0.8059 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 2.2360e-05 - acc: 1.0000 -
 val_loss: 0.7846 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 11ms/step - loss: 1.4721e-05 - acc: 1.0000 -
 val_loss: 0.7781 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 9.7724e-06 - acc: 1.0000 -
 val_loss: 0.7714 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6765e-06 - acc: 1.0000 -
 val_loss: 0.7658 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 4.5156e-06 - acc: 1.0000 -
 val_loss: 0.7603 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 6ms/step - loss: 3.2916e-06 - acc: 1.0000 -
 val_loss: 0.7549 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 2.2108e-06 - acc: 1.0000 -
 val_loss: 0.7419 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 1.1745e-06 - acc: 1.0000 -
 val_loss: 0.7388 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 7.9802e-07 - acc: 1.0000 -
 val_loss: 0.7308 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 5.9968e-07 - acc: 1.0000 -
 val_loss: 0.7292 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 4.3544e-07 - acc: 1.0000 -
 val_loss: 0.7314 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 6ms/step - loss: 3.2418e-07 - acc: 1.0000 -
 val_loss: 0.7346 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 2.4007e-07 - acc: 1.0000 -
 val_loss: 0.7251 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 1.8709e-07 - acc: 1.0000 -
 val_loss: 0.7288 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 1.5795e-07 - acc: 1.0000 -
 val_loss: 0.7204 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4338e-07 - acc: 1.0000 -
 val_loss: 0.7168 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 6.8545e-08 - acc: 1.0000 -
 val_loss: 0.7118 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 4.8677e-08 - acc: 1.0000 -
 val_loss: 0.7169 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 9ms/step - loss: 3.5100e-08 - acc: 1.0000 -
 val_loss: 0.7101 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 2.4835e-08 - acc: 1.0000 -
 val_loss: 0.7054 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 1.7550e-08 - acc: 1.0000 -
 val_loss: 0.6987 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1921e-08 - acc: 1.0000 -
 val_loss: 0.7072 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 8.2784e-09 - acc: 1.0000 -
 val_loss: 0.7009 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6227e-09 - acc: 1.0000 -
 val_loss: 0.6959 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 3.6425e-09 - acc: 1.0000 -
 val_loss: 0.6930 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6491e-09 - acc: 1.0000 -
 val_loss: 0.6903 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 7ms/step - loss: 2.3180e-09 - acc: 1.0000 -
 val_loss: 0.6904 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 0.6840 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 0.6785 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
val_loss: 0.6761 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6758 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 14ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6682 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6709 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6647 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6637 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6684 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6727 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6759 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6799 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6843 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6906 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.6954 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7059 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7088 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7135 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7276 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7358 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.8553 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 0.8451 - acc: 0.9306 - val_
loss: 1.1941 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 5ms/step - loss: 3.0751e-04 - acc: 1.0000 -
 val_loss: 1.1284 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 3.5825e-05 - acc: 1.0000 -
 val_loss: 1.1267 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 5ms/step - loss: 1.7352e-05 - acc: 1.0000 -
 val_loss: 1.1175 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3253e-05 - acc: 1.0000 -
 val_loss: 1.1079 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 9.6177e-06 - acc: 1.0000 -
 val_loss: 1.0982 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6599e-06 - acc: 1.0000 -
 val_loss: 1.0827 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 4.4357e-06 - acc: 1.0000 -
 val_loss: 1.0727 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 3.0507e-06 - acc: 1.0000 -
 val_loss: 1.0634 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 10ms/step - loss: 2.1251e-06 - acc: 1.0000 -
 val_loss: 1.0542 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 9ms/step - loss: 1.4665e-06 - acc: 1.0000 -
 val_loss: 1.0438 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0361e-06 - acc: 1.0000 -
 val_loss: 1.0385 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6855e-07 - acc: 1.0000 -
 val_loss: 1.0312 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 12ms/step - loss: 5.1624e-07 - acc: 1.0000 -
 val_loss: 1.0245 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 3.8974e-07 - acc: 1.0000 -
 val_loss: 1.0153 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 2.8676e-07 - acc: 1.0000 -
 val_loss: 1.0093 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 1.8775e-07 - acc: 1.0000 -
 val_loss: 1.0034 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3974e-07 - acc: 1.0000 -
 val_loss: 0.9954 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0298e-07 - acc: 1.0000 -
 val_loss: 0.9612 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 9ms/step - loss: 6.4903e-08 - acc: 1.0000 -
 val_loss: 0.9668 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 4.5035e-08 - acc: 1.0000 -
 val_loss: 0.9625 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 3.4107e-08 - acc: 1.0000 -
 val_loss: 0.9612 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 6ms/step - loss: 2.5829e-08 - acc: 1.0000 -
 val_loss: 0.9587 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 6ms/step - loss: 1.7881e-08 - acc: 1.0000 -
 val_loss: 0.9534 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 1.4239e-08 - acc: 1.0000 -
 val_loss: 0.9124 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 9.2718e-09 - acc: 1.0000 -
 val_loss: 0.9093 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 6ms/step - loss: 5.6293e-09 - acc: 1.0000 -
 val_loss: 0.9157 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 3.6425e-09 - acc: 1.0000 -
 val_loss: 0.9195 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6557e-09 - acc: 1.0000 -
 val_loss: 0.9134 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6557e-09 - acc: 1.0000 -
 val_loss: 0.9155 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 0.9245 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9196 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9284 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9302 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9412 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9535 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9684 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9540 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9453 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9438 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9561 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9639 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9434 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 11ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.8725 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 0.1757 - acc: 0.9806 - val_
loss: 7.2878 - val_acc: 0.4872
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 0.6087 - acc: 0.9528 - val_
loss: 1.0728 - val_acc: 0.8974
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 4.9914e-05 - acc: 1.0000 -
 val_loss: 1.0540 - val_acc: 0.8974
Epoch 5/30
8/8 [==============================] - 0s 6ms/step - loss: 1.0888e-05 - acc: 1.0000 -
 val_loss: 1.0539 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 8.3932e-06 - acc: 1.0000 -
 val_loss: 1.0526 - val_acc: 0.8974
Epoch 7/30
8/8 [==============================] - 0s 9ms/step - loss: 6.5403e-06 - acc: 1.0000 -
 val_loss: 1.0520 - val_acc: 0.8974
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 4.7435e-06 - acc: 1.0000 -
 val_loss: 1.0510 - val_acc: 0.8974
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 3.4818e-06 - acc: 1.0000 -
 val_loss: 1.0509 - val_acc: 0.8974
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6731e-06 - acc: 1.0000 -
 val_loss: 1.0516 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 1.7022e-06 - acc: 1.0000 -
 val_loss: 1.0520 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 1.1751e-06 - acc: 1.0000 -
 val_loss: 1.0521 - val_acc: 0.8974
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 8.0396e-07 - acc: 1.0000 -
 val_loss: 1.0546 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 3.7484e-07 - acc: 1.0000 -
 val_loss: 1.0537 - val_acc: 0.8974
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 2.8378e-07 - acc: 1.0000 -
 val_loss: 1.0522 - val_acc: 0.8974
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 2.0497e-07 - acc: 1.0000 -
 val_loss: 1.0546 - val_acc: 0.8974
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 2.5762e-07 - acc: 1.0000 -
 val_loss: 1.0536 - val_acc: 0.8974
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 1.2484e-07 - acc: 1.0000 -
 val_loss: 1.0519 - val_acc: 0.8974
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 6.8214e-08 - acc: 1.0000 -
 val_loss: 1.0502 - val_acc: 0.8974
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 4.2717e-08 - acc: 1.0000 -
 val_loss: 1.0470 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 2.9802e-08 - acc: 1.0000 -
 val_loss: 1.0435 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 2.1524e-08 - acc: 1.0000 -
 val_loss: 1.0246 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0596e-08 - acc: 1.0000 -
 val_loss: 1.0220 - val_acc: 0.8974
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 8.2784e-09 - acc: 1.0000 -
 val_loss: 1.0077 - val_acc: 0.8974
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 5.6293e-09 - acc: 1.0000 -
 val_loss: 1.0041 - val_acc: 0.8974
Epoch 26/30
8/8 [==============================] - 0s 5ms/step - loss: 4.6359e-09 - acc: 1.0000 -
 val_loss: 1.0016 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 2.9802e-09 - acc: 1.0000 -
 val_loss: 0.9975 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 2.3180e-09 - acc: 1.0000 -
 val_loss: 0.9889 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 2.3180e-09 - acc: 1.0000 -
 val_loss: 0.9830 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 0.9778 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 0.9625 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9562 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9551 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9705 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9756 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9806 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9801 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9847 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9837 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9900 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9855 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9816 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9726 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9726 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9799 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9823 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9820 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9958 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 0.9485 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9396 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9046 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9213 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9019 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 0.8847 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8773 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8718 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8632 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 6ms/step - loss: 0.7968 - acc: 0.9306 - val_
loss: 1.1422 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0096 - acc: 0.9972 - val_
loss: 1.0302 - val_acc: 0.8718
Epoch 30/30
8/8 [==============================] - 0s 8ms/step - loss: 2.5786e-06 - acc: 1.0000 -
 val_loss: 1.1053 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 16ms/step - loss: 1.2036e-06 - acc: 1.0000 -
 val_loss: 1.1089 - val_acc: 0.8974
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0606e-06 - acc: 1.0000 -
 val_loss: 1.1136 - val_acc: 0.8974
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 9.2847e-07 - acc: 1.0000 -
 val_loss: 1.1454 - val_acc: 0.8974
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 8.1258e-07 - acc: 1.0000 -
 val_loss: 1.1516 - val_acc: 0.8974
Epoch 5/30
8/8 [==============================] - 0s 9ms/step - loss: 7.1358e-07 - acc: 1.0000 -
 val_loss: 1.1583 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 6.2219e-07 - acc: 1.0000 -
 val_loss: 1.1648 - val_acc: 0.8974
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 5.3212e-07 - acc: 1.0000 -
 val_loss: 1.1651 - val_acc: 0.8974
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 4.4173e-07 - acc: 1.0000 -
 val_loss: 1.1636 - val_acc: 0.8974
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 3.5563e-07 - acc: 1.0000 -
 val_loss: 1.1754 - val_acc: 0.8974
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 2.8411e-07 - acc: 1.0000 -
 val_loss: 1.1782 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 2.0232e-07 - acc: 1.0000 -
 val_loss: 1.1703 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 6ms/step - loss: 1.5365e-07 - acc: 1.0000 -
 val_loss: 1.1849 - val_acc: 0.8974
Epoch 13/30
8/8 [==============================] - 0s 6ms/step - loss: 1.1921e-07 - acc: 1.0000 -
 val_loss: 1.1731 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 8.9738e-08 - acc: 1.0000 -
 val_loss: 1.1636 - val_acc: 0.8974
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6889e-08 - acc: 1.0000 -
 val_loss: 1.1990 - val_acc: 0.8974
Epoch 16/30
8/8 [==============================] - 0s 9ms/step - loss: 5.1657e-08 - acc: 1.0000 -
 val_loss: 1.1774 - val_acc: 0.8974
Epoch 17/30
8/8 [==============================] - 0s 6ms/step - loss: 3.5763e-08 - acc: 1.0000 -
 val_loss: 1.1636 - val_acc: 0.8974
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 2.7815e-08 - acc: 1.0000 -
 val_loss: 1.1535 - val_acc: 0.8974
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 2.0862e-08 - acc: 1.0000 -
 val_loss: 1.1456 - val_acc: 0.8974
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 1.8544e-08 - acc: 1.0000 -
 val_loss: 1.1190 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 1.1590e-08 - acc: 1.0000 -
 val_loss: 1.1240 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 9.2718e-09 - acc: 1.0000 -
 val_loss: 1.1208 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 3.6425e-09 - acc: 1.0000 -
 val_loss: 1.1100 - val_acc: 0.8974
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6491e-09 - acc: 1.0000 -
 val_loss: 1.1005 - val_acc: 0.8974
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6557e-09 - acc: 1.0000 -
 val_loss: 1.1010 - val_acc: 0.8974
Epoch 26/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 1.0919 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.0863 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0865 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.1061 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0997 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 14ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0944 - val_acc: 0.8974
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0943 - val_acc: 0.8974
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1033 - val_acc: 0.8974
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0873 - val_acc: 0.8974
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0791 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 0.9973 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 1.0389 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0026 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 0.8560 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8521 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.8584 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8573 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8518 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 0.8193 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 6ms/step - loss: 1.2613 - acc: 0.9083 - val_
loss: 1.0633 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0326e-04 - acc: 1.0000 -
 val_loss: 1.0585 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 5.9302e-05 - acc: 1.0000 -
 val_loss: 1.0486 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 3.9970e-05 - acc: 1.0000 -
 val_loss: 1.0383 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 2.7982e-05 - acc: 1.0000 -
 val_loss: 1.0274 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 2.0077e-05 - acc: 1.0000 -
 val_loss: 1.0180 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 1.4517e-05 - acc: 1.0000 -
 val_loss: 1.0081 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0829e-05 - acc: 1.0000 -
 val_loss: 0.9978 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 7.8844e-06 - acc: 1.0000 -
 val_loss: 0.9865 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 5.7641e-06 - acc: 1.0000 -
 val_loss: 0.9770 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 4.3698e-06 - acc: 1.0000 -
 val_loss: 0.9653 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 3.0412e-06 - acc: 1.0000 -
 val_loss: 0.9357 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9927e-06 - acc: 1.0000 -
 val_loss: 0.9339 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3662e-06 - acc: 1.0000 -
 val_loss: 0.9280 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 9.8477e-07 - acc: 1.0000 -
 val_loss: 0.9082 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 6.6127e-07 - acc: 1.0000 -
 val_loss: 0.9181 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 15ms/step - loss: 4.3610e-07 - acc: 1.0000 -
 val_loss: 0.9058 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 3.0233e-07 - acc: 1.0000 -
 val_loss: 0.9245 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 8ms/step - loss: 1.9073e-07 - acc: 1.0000 -
 val_loss: 0.9066 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2616e-07 - acc: 1.0000 -
 val_loss: 0.8904 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 8.2784e-08 - acc: 1.0000 -
 val_loss: 0.8903 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 6ms/step - loss: 5.6293e-08 - acc: 1.0000 -
 val_loss: 0.8716 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 4.0068e-08 - acc: 1.0000 -
 val_loss: 0.8504 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 2.5498e-08 - acc: 1.0000 -
 val_loss: 0.8456 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 1.7219e-08 - acc: 1.0000 -
 val_loss: 0.8348 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 1.1921e-08 - acc: 1.0000 -
 val_loss: 0.8560 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 9ms/step - loss: 7.9473e-09 - acc: 1.0000 -
 val_loss: 0.8235 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 4.3048e-09 - acc: 1.0000 -
 val_loss: 0.8327 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 2.9802e-09 - acc: 1.0000 -
 val_loss: 0.8029 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6557e-09 - acc: 1.0000 -
 val_loss: 0.8178 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 0.8143 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8046 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.8001 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7966 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7982 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7924 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7891 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7857 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7823 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7806 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7806 - val_acc: 0.8974
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7800 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7824 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7891 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7943 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7971 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 12ms/step - loss: 0.0000e+00 - acc: 1.0000 -
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 val_loss: 0.8000 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8032 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8064 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8095 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8115 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8106 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8140 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8161 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8184 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8242 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8250 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8235 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8239 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8231 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8165 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8170 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8178 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8175 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8169 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8143 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8121 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8157 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8126 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.7536 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-09 - acc: 1.0000 -
 val_loss: 0.6607 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 7ms/step - loss: 0.8504 - acc: 0.9389 - val_
loss: 1.2006 - val_acc: 0.8974
Epoch 27/30
8/8 [==============================] - 0s 6ms/step - loss: 3.4028e-04 - acc: 1.0000 -
 val_loss: 1.2468 - val_acc: 0.8974
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 2.0425e-06 - acc: 1.0000 -
 val_loss: 1.2454 - val_acc: 0.8974
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 1.7574e-06 - acc: 1.0000 -
 val_loss: 1.2442 - val_acc: 0.8974
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 1.6555e-06 - acc: 1.0000 -
 val_loss: 1.2430 - val_acc: 0.8974
Epoch 1/30
8/8 [==============================] - 0s 12ms/step - loss: 1.5485e-06 - acc: 1.0000 -
 val_loss: 1.2419 - val_acc: 0.8974
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 1.4145e-06 - acc: 1.0000 -
 val_loss: 1.2409 - val_acc: 0.8974
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 1.2579e-06 - acc: 1.0000 -
 val_loss: 1.2404 - val_acc: 0.8974
Epoch 4/30
8/8 [==============================] - 0s 5ms/step - loss: 1.1056e-06 - acc: 1.0000 -
 val_loss: 1.2393 - val_acc: 0.8974
Epoch 5/30
8/8 [==============================] - 0s 5ms/step - loss: 9.1421e-07 - acc: 1.0000 -
 val_loss: 1.2377 - val_acc: 0.8974
Epoch 6/30
8/8 [==============================] - 0s 6ms/step - loss: 7.6058e-07 - acc: 1.0000 -
 val_loss: 1.2358 - val_acc: 0.8974
Epoch 7/30
8/8 [==============================] - 0s 9ms/step - loss: 6.3807e-07 - acc: 1.0000 -
 val_loss: 1.2594 - val_acc: 0.8974
Epoch 8/30
8/8 [==============================] - 0s 7ms/step - loss: 2.2506e-06 - acc: 1.0000 -
 val_loss: 1.2651 - val_acc: 0.8974
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 2.9173e-07 - acc: 1.0000 -
 val_loss: 1.2531 - val_acc: 0.8974
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 1.8444e-07 - acc: 1.0000 -
 val_loss: 1.2433 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 6ms/step - loss: 7.0327e-07 - acc: 1.0000 -
 val_loss: 1.1873 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 1.0199e-07 - acc: 1.0000 -
 val_loss: 1.1777 - val_acc: 0.8974
Epoch 13/30
8/8 [==============================] - 0s 9ms/step - loss: 7.5830e-08 - acc: 1.0000 -
 val_loss: 1.1705 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 9ms/step - loss: 5.7949e-08 - acc: 1.0000 -
 val_loss: 1.1658 - val_acc: 0.8974
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 4.3710e-08 - acc: 1.0000 -
 val_loss: 1.1632 - val_acc: 0.8974
Epoch 16/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3445e-08 - acc: 1.0000 -
 val_loss: 1.1564 - val_acc: 0.8974
Epoch 17/30
8/8 [==============================] - 0s 9ms/step - loss: 2.4504e-08 - acc: 1.0000 -
 val_loss: 1.1505 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 1.8544e-08 - acc: 1.0000 -
 val_loss: 1.1480 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3245e-08 - acc: 1.0000 -
 val_loss: 1.1412 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 8.9407e-09 - acc: 1.0000 -
 val_loss: 1.1283 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6227e-09 - acc: 1.0000 -
 val_loss: 1.1219 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 4.6359e-09 - acc: 1.0000 -
 val_loss: 1.1283 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 3.9736e-09 - acc: 1.0000 -
 val_loss: 1.0895 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9868e-09 - acc: 1.0000 -
 val_loss: 1.0750 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 1.0683 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 1.0608 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 1.0531 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0464 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0447 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0411 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 14ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0276 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9594 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 0.9866 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9676 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9305 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9128 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8783 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.8146 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.9199 - val_acc: 0.8974
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8964 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8815 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8673 - val_acc: 0.8974
Epoch 13/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8574 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8287 - val_acc: 0.8974
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7851 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 0.3143 - acc: 0.9889 - val_
loss: 10.2476 - val_acc: 0.4615
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 0.3657 - acc: 0.9556 - val_
loss: 1.6899 - val_acc: 0.8974
Epoch 18/30
8/8 [==============================] - 0s 7ms/step - loss: 5.1070e-06 - acc: 1.0000 -
 val_loss: 1.6818 - val_acc: 0.8974
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 4.6159e-06 - acc: 1.0000 -
 val_loss: 1.6725 - val_acc: 0.8974
Epoch 20/30
8/8 [==============================] - 0s 9ms/step - loss: 4.0746e-06 - acc: 1.0000 -
 val_loss: 1.6620 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 9ms/step - loss: 3.5276e-06 - acc: 1.0000 -
 val_loss: 1.6456 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 2.8771e-06 - acc: 1.0000 -
 val_loss: 1.6024 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 2.2509e-06 - acc: 1.0000 -
 val_loss: 1.5891 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 1.7137e-06 - acc: 1.0000 -
 val_loss: 1.5727 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1797e-06 - acc: 1.0000 -
 val_loss: 1.5559 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 8.4996e-07 - acc: 1.0000 -
 val_loss: 1.5388 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 6.1820e-07 - acc: 1.0000 -
 val_loss: 1.5163 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 6ms/step - loss: 4.0861e-07 - acc: 1.0000 -
 val_loss: 1.4943 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 2.8146e-07 - acc: 1.0000 -
 val_loss: 1.4704 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9802e-07 - acc: 1.0000 -
 val_loss: 1.4438 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 1.3510e-07 - acc: 1.0000 -
 val_loss: 1.4239 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 9.8347e-08 - acc: 1.0000 -
 val_loss: 1.3941 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 6.3247e-08 - acc: 1.0000 -
 val_loss: 1.3644 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 9ms/step - loss: 4.5035e-08 - acc: 1.0000 -
 val_loss: 1.3335 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 3.0796e-08 - acc: 1.0000 -
 val_loss: 1.3384 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 2.1524e-08 - acc: 1.0000 -
 val_loss: 1.3020 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 1.6557e-08 - acc: 1.0000 -
 val_loss: 1.2623 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0928e-08 - acc: 1.0000 -
 val_loss: 1.2074 - val_acc: 0.9231
Epoch 9/30
8/8 [==============================] - 0s 9ms/step - loss: 4.9671e-09 - acc: 1.0000 -
 val_loss: 1.1984 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 3.9736e-09 - acc: 1.0000 -
 val_loss: 1.1881 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-09 - acc: 1.0000 -
 val_loss: 1.1775 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6491e-09 - acc: 1.0000 -
 val_loss: 1.1663 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 2.6491e-09 - acc: 1.0000 -
 val_loss: 1.1531 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 1.1417 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1344 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1269 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1164 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.1041 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0907 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0758 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0579 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0411 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0269 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0003 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9801 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9641 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9521 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9407 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9304 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9200 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 35ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9122 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9005 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8911 - val_acc: 0.9744
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8818 - val_acc: 0.9744
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8701 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8454 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.8341 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 0.9730 - acc: 0.9528 - val_
loss: 1.9145 - val_acc: 0.8462
Epoch 9/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0096 - acc: 0.9972 - val_
loss: 0.8724 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 8ms/step - loss: 1.9084e-04 - acc: 1.0000 -
 val_loss: 1.0252 - val_acc: 0.9231
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 1.4988e-06 - acc: 1.0000 -
 val_loss: 1.0270 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1995e-06 - acc: 1.0000 -
 val_loss: 1.0285 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 7ms/step - loss: 9.4165e-07 - acc: 1.0000 -
 val_loss: 1.0296 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 7ms/step - loss: 7.3209e-07 - acc: 1.0000 -
 val_loss: 1.0300 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 7ms/step - loss: 5.7284e-07 - acc: 1.0000 -
 val_loss: 1.0320 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 4.2517e-07 - acc: 1.0000 -
 val_loss: 1.0329 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 8ms/step - loss: 3.2583e-07 - acc: 1.0000 -
 val_loss: 1.0343 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 2.5067e-07 - acc: 1.0000 -
 val_loss: 1.0353 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 7ms/step - loss: 1.9106e-07 - acc: 1.0000 -
 val_loss: 1.0364 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 6ms/step - loss: 1.2186e-07 - acc: 1.0000 -
 val_loss: 1.0375 - val_acc: 0.9231
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 9.4042e-08 - acc: 1.0000 -
 val_loss: 1.0389 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 10ms/step - loss: 8.5764e-08 - acc: 1.0000 -
 val_loss: 1.0394 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 10ms/step - loss: 8.9738e-08 - acc: 1.0000 -
 val_loss: 1.0402 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 10ms/step - loss: 3.7418e-08 - acc: 1.0000 -
 val_loss: 1.0412 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 8ms/step - loss: 2.6822e-08 - acc: 1.0000 -
 val_loss: 1.0425 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 6ms/step - loss: 1.9206e-08 - acc: 1.0000 -
 val_loss: 1.0603 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 9.9341e-09 - acc: 1.0000 -
 val_loss: 1.0593 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 7.6161e-09 - acc: 1.0000 -
 val_loss: 1.0582 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 6ms/step - loss: 5.6293e-09 - acc: 1.0000 -
 val_loss: 1.0578 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 4.6359e-09 - acc: 1.0000 -
 val_loss: 1.0570 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 14ms/step - loss: 3.3114e-09 - acc: 1.0000 -
 val_loss: 1.0568 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 2.3180e-09 - acc: 1.0000 -
 val_loss: 1.0559 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 1.0562 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 9.9341e-10 - acc: 1.0000 -
 val_loss: 1.0532 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0551 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0570 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0577 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0571 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0747 - val_acc: 0.9231
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0605 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0474 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0334 - val_acc: 0.8974
Epoch 13/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0184 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0111 - val_acc: 0.9231
Epoch 15/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0028 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9961 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9883 - val_acc: 0.9231
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9921 - val_acc: 0.9231
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.9893 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 1.2806 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 9ms/step - loss: 1.1034 - acc: 0.9528 - val_
loss: 0.5453 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 11ms/step - loss: 1.5733e-06 - acc: 1.0000 -
 val_loss: 0.4923 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 10ms/step - loss: 1.3409e-06 - acc: 1.0000 -
 val_loss: 0.5110 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 9ms/step - loss: 1.1893e-06 - acc: 1.0000 -
 val_loss: 0.5175 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0535e-06 - acc: 1.0000 -
 val_loss: 0.5250 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 9.2409e-07 - acc: 1.0000 -
 val_loss: 0.5346 - val_acc: 0.9487
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 7.6551e-07 - acc: 1.0000 -
 val_loss: 0.5457 - val_acc: 0.9487
Epoch 28/30
8/8 [==============================] - 0s 7ms/step - loss: 6.2580e-07 - acc: 1.0000 -
 val_loss: 0.5573 - val_acc: 0.9487
Epoch 29/30
8/8 [==============================] - 0s 7ms/step - loss: 5.0164e-07 - acc: 1.0000 -
 val_loss: 0.5697 - val_acc: 0.9487
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 3.6291e-07 - acc: 1.0000 -
 val_loss: 0.5848 - val_acc: 0.9487
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 2.6523e-07 - acc: 1.0000 -
 val_loss: 0.6010 - val_acc: 0.9487
Epoch 2/30
8/8 [==============================] - 0s 6ms/step - loss: 7.4174e-08 - acc: 1.0000 -
 val_loss: 0.6177 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 6.5896e-08 - acc: 1.0000 -
 val_loss: 0.6346 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 6ms/step - loss: 5.7949e-08 - acc: 1.0000 -
 val_loss: 0.6023 - val_acc: 0.9487
Epoch 5/30
8/8 [==============================] - 0s 10ms/step - loss: 5.0002e-08 - acc: 1.0000 -
 val_loss: 0.6447 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 10ms/step - loss: 4.2385e-08 - acc: 1.0000 -
 val_loss: 0.6648 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3445e-08 - acc: 1.0000 -
 val_loss: 0.6849 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 10ms/step - loss: 2.4173e-08 - acc: 1.0000 -
 val_loss: 0.6709 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 9ms/step - loss: 1.8213e-08 - acc: 1.0000 -
 val_loss: 0.6991 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 1.3245e-08 - acc: 1.0000 -
 val_loss: 0.7240 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 9.9341e-09 - acc: 1.0000 -
 val_loss: 0.7388 - val_acc: 0.9487
Epoch 12/30
8/8 [==============================] - 0s 7ms/step - loss: 6.9539e-09 - acc: 1.0000 -
 val_loss: 0.7625 - val_acc: 0.9487
Epoch 13/30
8/8 [==============================] - 0s 8ms/step - loss: 4.9671e-09 - acc: 1.0000 -
 val_loss: 0.7031 - val_acc: 0.9487
Epoch 14/30
8/8 [==============================] - 0s 5ms/step - loss: 3.3114e-09 - acc: 1.0000 -
 val_loss: 0.7286 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 8ms/step - loss: 2.3180e-09 - acc: 1.0000 -
 val_loss: 0.7958 - val_acc: 0.9487
Epoch 16/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6557e-09 - acc: 1.0000 -
 val_loss: 0.7135 - val_acc: 0.9487
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 1.3245e-09 - acc: 1.0000 -
 val_loss: 0.7177 - val_acc: 0.9487
Epoch 18/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 0.7195 - val_acc: 0.9487
Epoch 19/30
8/8 [==============================] - 0s 8ms/step - loss: 6.6227e-10 - acc: 1.0000 -
 val_loss: 0.7313 - val_acc: 0.9487
Epoch 20/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.7326 - val_acc: 0.9487
Epoch 21/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7315 - val_acc: 0.9487
Epoch 22/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7329 - val_acc: 0.9487
Epoch 23/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7455 - val_acc: 0.9487
Epoch 24/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7482 - val_acc: 0.9487
Epoch 25/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.7595 - val_acc: 0.9487
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7627 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7660 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7702 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7749 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7783 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 13ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7810 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7820 - val_acc: 0.9487
Epoch 3/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7803 - val_acc: 0.9487
Epoch 4/30
8/8 [==============================] - 0s 11ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8025 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7717 - val_acc: 0.9487
Epoch 6/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7757 - val_acc: 0.9487
Epoch 7/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7774 - val_acc: 0.9487
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7903 - val_acc: 0.9487
Epoch 9/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7967 - val_acc: 0.9487
Epoch 10/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.7774 - val_acc: 0.9487
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8133 - val_acc: 0.9231
Epoch 12/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.8087 - val_acc: 0.9231
Epoch 13/30
8/8 [==============================] - 0s 10ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.7283 - val_acc: 0.9231
Epoch 14/30
8/8 [==============================] - 0s 9ms/step - loss: 3.3114e-09 - acc: 1.0000 -
 val_loss: 0.6569 - val_acc: 0.9487
Epoch 15/30
8/8 [==============================] - 0s 10ms/step - loss: 3.3114e-10 - acc: 1.0000 -
 val_loss: 0.6959 - val_acc: 0.9231
Epoch 16/30
8/8 [==============================] - 0s 10ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 0.7090 - val_acc: 0.9231
Epoch 17/30
8/8 [==============================] - 0s 11ms/step - loss: 0.6555 - acc: 0.9472 - val
_loss: 11.8923 - val_acc: 0.5128
Epoch 18/30
8/8 [==============================] - 0s 9ms/step - loss: 0.5378 - acc: 0.9528 - val_
loss: 1.6099 - val_acc: 0.8718
Epoch 19/30
8/8 [==============================] - 0s 9ms/step - loss: 8.5589e-04 - acc: 1.0000 -
 val_loss: 1.4108 - val_acc: 0.8974
Epoch 20/30
8/8 [==============================] - 0s 10ms/step - loss: 7.0532e-05 - acc: 1.0000 -
 val_loss: 1.3945 - val_acc: 0.8974
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3655e-05 - acc: 1.0000 -
 val_loss: 1.3795 - val_acc: 0.8974
Epoch 22/30
8/8 [==============================] - 0s 7ms/step - loss: 2.0275e-05 - acc: 1.0000 -
 val_loss: 1.3704 - val_acc: 0.8974
Epoch 23/30
8/8 [==============================] - 0s 8ms/step - loss: 1.5002e-05 - acc: 1.0000 -
 val_loss: 1.3622 - val_acc: 0.8974
Epoch 24/30
8/8 [==============================] - 0s 7ms/step - loss: 1.1450e-05 - acc: 1.0000 -
 val_loss: 1.3513 - val_acc: 0.8974
Epoch 25/30
8/8 [==============================] - 0s 6ms/step - loss: 8.2859e-06 - acc: 1.0000 -
 val_loss: 1.3409 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 8ms/step - loss: 6.1476e-06 - acc: 1.0000 -
 val_loss: 1.3305 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 9ms/step - loss: 4.5904e-06 - acc: 1.0000 -
 val_loss: 1.3209 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 3.3379e-06 - acc: 1.0000 -
 val_loss: 1.3109 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 9ms/step - loss: 2.4463e-06 - acc: 1.0000 -
 val_loss: 1.3007 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 1.7212e-06 - acc: 1.0000 -
 val_loss: 1.2914 - val_acc: 0.9231
Epoch 1/30
8/8 [==============================] - 0s 11ms/step - loss: 1.2603e-06 - acc: 1.0000 -
 val_loss: 1.2796 - val_acc: 0.9231
Epoch 2/30
8/8 [==============================] - 0s 7ms/step - loss: 8.7187e-07 - acc: 1.0000 -
 val_loss: 1.2702 - val_acc: 0.9231
Epoch 3/30
8/8 [==============================] - 0s 6ms/step - loss: 5.7683e-07 - acc: 1.0000 -
 val_loss: 1.2610 - val_acc: 0.9231
Epoch 4/30
8/8 [==============================] - 0s 8ms/step - loss: 4.0167e-07 - acc: 1.0000 -
 val_loss: 1.2563 - val_acc: 0.9231
Epoch 5/30
8/8 [==============================] - 0s 9ms/step - loss: 2.5266e-07 - acc: 1.0000 -
 val_loss: 1.2467 - val_acc: 0.9231
Epoch 6/30
8/8 [==============================] - 0s 10ms/step - loss: 1.7815e-07 - acc: 1.0000 -
 val_loss: 1.2376 - val_acc: 0.9231
Epoch 7/30
8/8 [==============================] - 0s 8ms/step - loss: 1.2418e-07 - acc: 1.0000 -
 val_loss: 1.2292 - val_acc: 0.9231
Epoch 8/30
8/8 [==============================] - 0s 8ms/step - loss: 8.5433e-08 - acc: 1.0000 -
 val_loss: 1.2227 - val_acc: 0.8974
Epoch 9/30
8/8 [==============================] - 0s 9ms/step - loss: 5.7287e-08 - acc: 1.0000 -
 val_loss: 1.2219 - val_acc: 0.8974
Epoch 10/30
8/8 [==============================] - 0s 9ms/step - loss: 3.7418e-08 - acc: 1.0000 -
 val_loss: 1.2149 - val_acc: 0.8974
Epoch 11/30
8/8 [==============================] - 0s 7ms/step - loss: 2.7815e-08 - acc: 1.0000 -
 val_loss: 1.2068 - val_acc: 0.8974
Epoch 12/30
8/8 [==============================] - 0s 8ms/step - loss: 1.9537e-08 - acc: 1.0000 -
 val_loss: 1.2354 - val_acc: 0.8974
Epoch 13/30
8/8 [==============================] - 0s 9ms/step - loss: 1.5895e-08 - acc: 1.0000 -
 val_loss: 1.2051 - val_acc: 0.8974
Epoch 14/30
8/8 [==============================] - 0s 9ms/step - loss: 1.0596e-08 - acc: 1.0000 -
 val_loss: 1.1785 - val_acc: 0.8974
Epoch 15/30
8/8 [==============================] - 0s 9ms/step - loss: 7.2850e-09 - acc: 1.0000 -
 val_loss: 1.1718 - val_acc: 0.8974
Epoch 16/30
8/8 [==============================] - 0s 7ms/step - loss: 4.9671e-09 - acc: 1.0000 -
 val_loss: 1.1618 - val_acc: 0.8974
Epoch 17/30
8/8 [==============================] - 0s 7ms/step - loss: 3.3114e-09 - acc: 1.0000 -
 val_loss: 1.1426 - val_acc: 0.8974
Epoch 18/30
8/8 [==============================] - 0s 6ms/step - loss: 1.6557e-09 - acc: 1.0000 -
 val_loss: 1.1986 - val_acc: 0.8718
Epoch 19/30
8/8 [==============================] - 0s 5ms/step - loss: 9.6030e-09 - acc: 1.0000 -
 val_loss: 1.0155 - val_acc: 0.9231
Epoch 20/30
8/8 [==============================] - 0s 5ms/step - loss: 6.9539e-09 - acc: 1.0000 -
 val_loss: 1.2027 - val_acc: 0.8718
Epoch 21/30
8/8 [==============================] - 0s 7ms/step - loss: 4.9671e-09 - acc: 1.0000 -
 val_loss: 1.0348 - val_acc: 0.9231
Epoch 22/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0403 - val_acc: 0.9231
Epoch 23/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0331 - val_acc: 0.9231
Epoch 24/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0366 - val_acc: 0.9231
Epoch 25/30
8/8 [==============================] - 0s 7ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0396 - val_acc: 0.9231
Epoch 26/30
8/8 [==============================] - 0s 9ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0434 - val_acc: 0.9231
Epoch 27/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0509 - val_acc: 0.9231
Epoch 28/30
8/8 [==============================] - 0s 8ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0519 - val_acc: 0.9231
Epoch 29/30
8/8 [==============================] - 0s 5ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0534 - val_acc: 0.9231
Epoch 30/30
8/8 [==============================] - 0s 6ms/step - loss: 0.0000e+00 - acc: 1.0000 -
 val_loss: 1.0568 - val_acc: 0.9231
~~~

In [9]:

```python
scores=model.evaluate(x_val, y_val, verbose=0)
print((model.metrics_names[1], scores[1]*100))
~~~

```
('acc', 92.30769276618958)
```

The accuracy of the model varies from 85% - 95%. We can improve the accuracy by fluctuating the hyperparameters.

In [10]:

```python
Xnew=["kindly undo the changes","Can you please undo the last paragraph","Make bold th
sequences_new=tokenizer.texts_to_sequences(Xnew)
data=pad_sequences(sequences_new, maxlen=MAX_SEQUENCE_LENGTH)
yprob=model.predict(data)
yclasses=yprob.argmax(axis=1)
print("X=%s, Predicted=%s \nX=%s, \nPredicted=%s \nX=%s, \nPredicted=%s \nX=%s, Predic
```

```
X=kindly undo the changes, Predicted=1
X=Can you please undo the last paragraph,
Predicted=1
X=Make bold this,
Predicted=2
X=Would you be kind enough to bold the last word?, Predicted=2
X=Please remove bold from the last paragraph, Predicted=3
X=Kindly unbold the selected text, Predicted=3
X=Kindly insert comment here, Predicted=19
X=Can you please put a comment here, Predicted=15
X=Can you please centre align this text, Predicted=14
X=Can you please position this text in the middle, Predicted=14
```

CNN worked well when passed through the dataset.

In [ ]:

Intent Classification using Universal Sentence Encoder

In [11]:

```python
import os
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.metrics import classification_report
from tqdm.auto import tqdm
tqdm.pandas()

import tensorflow as tf
import tensorflow_hub as hub
from tensorflow.keras.optimizers import Adam, SGD
from tensorflow.keras.layers import Dense, Input, Flatten, BatchNormalization, Dropout
from tensorflow.keras.models import Model, Sequential
from tensorflow.keras.callbacks import ModelCheckpoint
```

ATIS is a most common dataset used for intent classification. The dataset contains large number of messages and their intents.

In [12]:

```python
train=pd.read_csv(r'D:\Surrey\Semester\Semester 2\NLP\atis_intents_train.csv')
train.columns=['intent', 'snippet']
```

In [13]:

```python
train.head()
```

Out[13]:

	intent	snippet
0	atis_flight	what flights are available from pittsburgh to...
1	atis_flight_time	what is the arrival time in san francisco for...
2	atis_airfare	cheapest airfare from tacoma to orlando
3	atis_airfare	round trip fares from pittsburgh to philadelp...
4	atis_flight	i need a flight tomorrow from columbus to min...

In [14]:

```python
train.intent.value_counts(), train.intent.value_counts(normalize=True)
```

Out[14]:

```
(atis_flight            3665
 atis_airfare            423
 atis_ground_service     255
 atis_airline            157
 atis_abbreviation       147
 atis_aircraft            81
 atis_flight_time         54
 atis_quantity            51
 Name: intent, dtype: int64,
 atis_flight            0.758328
 atis_airfare           0.087523
 atis_ground_service    0.052762
 atis_airline           0.032485
 atis_abbreviation      0.030416
 atis_aircraft          0.016760
 atis_flight_time       0.011173
 atis_quantity          0.010552
 Name: intent, dtype: float64)
```

In [15]:

```python
train.intent.value_counts(), train.intent.value_counts(normalize=True)
```

Out[15]:

```
(atis_flight            3665
 atis_airfare            423
 atis_ground_service     255
 atis_airline            157
 atis_abbreviation       147
 atis_aircraft            81
 atis_flight_time         54
 atis_quantity            51
 Name: intent, dtype: int64,
 atis_flight            0.758328
 atis_airfare           0.087523
 atis_ground_service    0.052762
 atis_airline           0.032485
 atis_abbreviation      0.030416
 atis_aircraft          0.016760
 atis_flight_time       0.011173
 atis_quantity          0.010552
 Name: intent, dtype: float64)
```

In [16]:

```python
test=pd.read_csv(r'D:\Surrey\Semester\Semester 2\NLP\atis_intents_test.csv')
test.columns=['intent', 'snippet']
test.head()
```

Out[16]:

	intent	snippet
0	atis_airfare	on april first i need a ticket from tacoma to...
1	atis_flight	on april first i need a flight going from pho...
2	atis_flight	i would like a flight traveling one way from ...
3	atis_flight	i would like a flight from orlando to salt la...
4	atis_flight	i need a flight from toronto to newark one wa...

In [17]:

```python
test.intent.value_counts(), test.intent.value_counts(normalize=True)
```

Out[17]:

```
(atis_flight            631
 atis_airfare            48
 atis_airline            38
```
~~~

```
atis_ground_service     36
atis_abbreviation       33
atis_aircraft            9
atis_quantity            3
atis_flight_time         1
Name: intent, dtype: int64,
atis_flight            0.789737
atis_airfare           0.060075
atis_airline           0.047559
atis_ground_service    0.045056
atis_abbreviation      0.041302
atis_aircraft          0.011264
atis_quantity          0.003755
atis_flight_time       0.001252
Name: intent, dtype: float64)
```

In [18]:

```python
train_data = train.snippet.values
train_labels = train.intent.values
test_data = test.snippet.values
test_labels = test.intent.values

len(train_data), len(train_labels), len(test_data), len(test_labels)
```

Out[18]:

```
(4833, 4833, 799, 799)
```

In [19]:

```python
print(train_data[123])
print(train_labels[123])
```

```
 okay i need to get a flight from houston to seattle
atis_flight
```

In [20]:

```python
y_train = pd.get_dummies(train_labels)
print(y_train.shape)
y_train.head()
```

```
(4833, 8)
```

Out[20]:

	atis_abbreviation	atis_aircraft	atis_airfare	atis_airline	atis_flight	atis_flight_time	atis_ground_service	atis_
0	0	0	0	0	1	0	0	
1	0	0	0	0	0	1	0	
2	0	0	1	0	0	0	0	
3	0	0	1	0	0	0	0	
4	0	0	0	0	1	0	0	

In [21]:

```python
y_test = pd.get_dummies(test_labels)
print(y_test.shape)
y_test.head()
```

```
(799, 8)
```

Out[21]:

	atis_abbreviation	atis_aircraft	atis_airfare	atis_airline	atis_flight	atis_flight_time	atis_ground_service	atis_
0	0	0	1	0	0	0	0	
1	0	0	0	0	1	0	0	
2	0	0	0	0	1	0	0	
3	0	0	0	0	1	0	0	
4	0	0	0	0	1	0	0	

Universal Sentence Encoder is developer tool from Google which is used as a Python Library for Intent Classifcation.

Initially this link will take time to load depending on your system.

In [22]:

```python
%%time
module_url = 'https://tfhub.dev/google/universal-sentence-encoder-large/4'
embed = hub.KerasLayer(module_url, trainable=True, name='USE_embedding')
```

```
Wall time: 33.7 s
```

In [23]:

```python
def build_model(embed):
    
    model = Sequential([
        Input(shape=[], dtype=tf.string),
        embed,
        Dense(8, activation='softmax')
    ])
    model.compile(Adam(1e-5), loss='categorical_crossentropy', metrics=['accuracy'])
    
    return model

model = build_model(embed)
model.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #   
=================================================================
 USE_embedding (KerasLayer)  {'outputs': (None, 512)}  147354880 
                                                                 
 dense_2 (Dense)             (None, 8)                 4104      
                                                                 
=================================================================
Total params: 147,358,984
Trainable params: 147,358,984
Non-trainable params: 0
_________________________________________________________________
```

In [24]:

```python
checkpoint = ModelCheckpoint('modelATIS.h5', monitor='val_loss', save_best_only=True)

train_history = model.fit(
    train_data, y_train,
    validation_split=0.20,
    epochs = 10,
    callbacks=[checkpoint],
    batch_size=32
)
```

```
Epoch 1/10
WARNING:tensorflow:Gradients do not exist for variables ['EncoderDNN/DNN/ResidualHidde
n_0/dense/kernel/part_0:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_1:0',
'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_2:0', 'EncoderDNN/DNN/ResidualHidde
n_0/dense/kernel/part_3:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_4:0',
'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_5:0', 'EncoderDNN/DNN/ResidualHidde
n_0/dense/kernel/part_6:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_7:0',
'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_8:0', 'EncoderDNN/DNN/ResidualHidde
n_0/dense/kernel/part_9:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_10:0',
'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_11:0', 'EncoderDNN/DNN/ResidualHidd
en_0/dense/kernel/part_12:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_13:
0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_14:0', 'EncoderDNN/DNN/Residual
Hidden_0/dense/kernel/part_15:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_1
6:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_17:0', 'EncoderDNN/DNN/Residu
alHidden_0/dense/kernel/part_18:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part
_19:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_20:0', 'EncoderDNN/DNN/Resi
dualHidden_0/dense/kernel/part_21:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/pa
rt_22:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/part_23:0', 'EncoderDNN/DNN/Re
sidualHidden_0/dense/kernel/part_24:0', 'EncoderDNN/DNN/ResidualHidden_0/dense/kernel/
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n_3/AdjustDepth/projection/kernel/part_29:0'] when minimizing the loss. If you're usin
g `model.compile()`, did you forget to provide a `loss`argument?
```

```
WARNING:tensorflow:Gradients do not exist for variables ['EncoderDNN/DNN/ResidualHidde
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n_3/AdjustDepth/projection/kernel/part_29:0'] when minimizing the loss. If you're usin
g `model.compile()`, did you forget to provide a `loss`argument?
```

```
WARNING:tensorflow:Gradients do not exist for variables ['EncoderDNN/DNN/ResidualHidde
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n_3/AdjustDepth/projection/kernel/part_29:0'] when minimizing the loss. If you're usin
g `model.compile()`, did you forget to provide a `loss`argument?
```

```
WARNING:tensorflow:Gradients do not exist for variables ['EncoderDNN/DNN/ResidualHidde
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```

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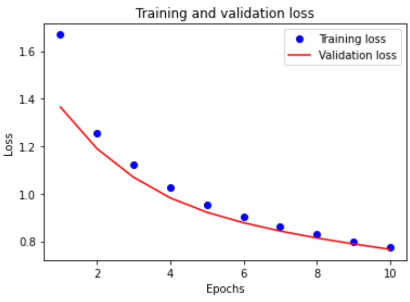
n_3/AdjustDepth/projection/kernel/part_29:0'] when minimizing the loss. If you're usin
g `model.compile()`, did you forget to provide a `loss`argument?
121/121 [==============================] - 300s 2s/step - loss: 1.6702 - accuracy: 0.7
142 - val_loss: 1.3657 - val_accuracy: 0.7497
Epoch 2/10
121/121 [==============================] - 205s 2s/step - loss: 1.2536 - accuracy: 0.7
770 - val_loss: 1.1902 - val_accuracy: 0.8108
Epoch 3/10
121/121 [==============================] - 202s 2s/step - loss: 1.1249 - accuracy: 0.8
531 - val_loss: 1.0699 - val_accuracy: 0.9080
Epoch 4/10
121/121 [==============================] - 194s 2s/step - loss: 1.0263 - accuracy: 0.9
296 - val_loss: 0.9832 - val_accuracy: 0.9731
Epoch 5/10
121/121 [==============================] - 191s 2s/step - loss: 0.9560 - accuracy: 0.9
713 - val_loss: 0.9228 - val_accuracy: 0.9835
Epoch 6/10
121/121 [==============================] - 194s 2s/step - loss: 0.9035 - accuracy: 0.9
801 - val_loss: 0.8787 - val_accuracy: 0.9845
Epoch 7/10
121/121 [==============================] - 195s 2s/step - loss: 0.8623 - accuracy: 0.9
858 - val_loss: 0.8438 - val_accuracy: 0.9917
Epoch 8/10
121/121 [==============================] - 196s 2s/step - loss: 0.8285 - accuracy: 0.9
930 - val_loss: 0.8145 - val_accuracy: 0.9928
Epoch 9/10
121/121 [==============================] - 198s 2s/step - loss: 0.7996 - accuracy: 0.9
959 - val_loss: 0.7895 - val_accuracy: 0.9928
Epoch 10/10
121/121 [==============================] - 186s 2s/step - loss: 0.7739 - accuracy: 0.9
972 - val_loss: 0.7668 - val_accuracy: 0.9938
```

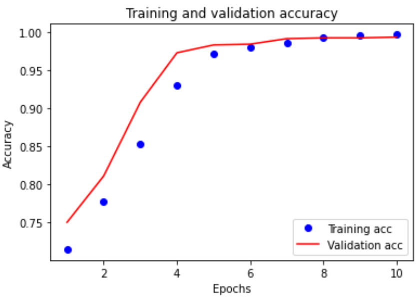
In [25]:

```
plt.clf()
history_dict = train_history.history
loss_values = history_dict['loss']
val_loss_values = history_dict['val_loss']
epochs = range(1, (len(history_dict['loss']) + 1))
plt.plot(epochs, loss_values, 'bo', label='Training loss')
plt.plot(epochs, val_loss_values, 'r', label='Validation loss')
plt.title('Training and validation loss')
plt.xlabel('Epochs')
plt.ylabel('Loss')
plt.legend()
plt.show()
```



In [26]:

```
plt.clf()
acc_values = history_dict['accuracy']
val_acc_values = history_dict['val_accuracy']
epochs = range(1, (len(history_dict['accuracy']) + 1))
plt.plot(epochs, acc_values, 'bo', label='Training acc')
plt.plot(epochs, val_acc_values, 'r', label='Validation acc')
plt.title('Training and validation accuracy')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.show()
```



The figure 1 gives the loss value. As the epochs are increased the loss values are decreased, this denotes that the model is working well with the intents and also it is able to understand the context better.

The figure 2 graph also comes in support of the model. The accuracy is is increased which means the model can be able to detect some complex intents when tested.

In [27]:

```
rawPreds = model.predict(test_data)
rawPreds.shape
```

Out[27]:

```
(799, 8)
```

In [28]:

```
Preds = []

for j in range(rawPreds.shape[0]):
    pos = rawPreds[j].argmax()
    Preds.append(y_test.columns[pos])

len(Preds)
```

Out[28]:

```
799
```

In [29]:

```
print(classification_report(Preds, test_labels))
```

```
                     precision    recall  f1-score   support

  atis_abbreviation       1.00      1.00      1.00        33
      atis_aircraft       1.00      1.00      1.00         9
       atis_airfare       1.00      1.00      1.00        48
       atis_airline       1.00      1.00      1.00        38
        atis_flight       0.99      1.00      1.00       627
   atis_flight_time       1.00      1.00      1.00         1
atis_ground_service       1.00      1.00      1.00        36
      atis_quantity       1.00      0.43      0.60         7

           accuracy                           0.99       799
          macro avg       1.00      0.93      0.95       799
       weighted avg       1.00      0.99      0.99       799
```

The classification report is the final draft which gives us the brief about the model. We can see that the model is giving us 99% accuracy on detecting the intent.

In [ ]:

Intent Classification using LSTM

This is the same dataset as previous one, in this experiment we are using LSTM.

In [30]:

```
import pandas as pd
import numpy as np
```

In [31]:

```
train_data=pd.read_csv(r'D:\Surrey\Semester\Semester 2\NLP\atis_intents_train.csv', na
```

In [32]:

```
test_data=pd.read_csv(r'D:\Surrey\Semester\Semester 2\NLP\atis_intents_test.csv', name
```

In [33]:

```
train_data
```

Out[33]:

	target	text
0	atis_flight	i want to fly from boston at 838 am and arriv...
1	atis_flight	what flights are available from pittsburgh to...

2	atis_flight_time	what is the arrival time in san francisco for...
3	atis_airfare	cheapest airfare from tacoma to orlando
4	atis_airfare	round trip fares from pittsburgh to philadelp...
...	...	...
4829	atis_airfare	what is the airfare for flights from denver t...
4830	atis_flight	do you have any flights from denver to baltim...
4831	atis_airline	which airlines fly into and out of denver
4832	atis_flight	does continental fly from boston to san franc...
4833	atis_flight	is there a delta flight from denver to san fr...

4834 rows × 2 columns

In [34]:

```
train_data.groupby('target').count()
```

Out[34]:

	text
target	
atis_abbreviation	147
atis_aircraft	81
atis_airfare	423
atis_airline	157
atis_flight	3666
atis_flight_time	54
atis_ground_service	255
atis_quantity	51

In [35]:

```
train_data=train_data.append(train_data.loc[train_data.target.isin(['atis_flight_time
```

In [36]:

```
from sklearn.preprocessing import OneHotEncoder as OHE
y_encoder=OHE().fit(np.array(train_data.target).reshape(-1,1))
```

In [37]:

```
ytr_encoded=y_encoder.transform(np.array(train_data.target).reshape(-1,1)).toarray()
yts_encoded=y_encoder.transform(np.array(test_data.target).reshape(-1,1)).toarray()
```

In [38]:

```
import nltk
```

In [39]:

```
train_data['lower_text']=train_data.text.map(lambda x: x.lower())
test_data['lower_text']= test_data.text.map(lambda x: x.lower())
```

In [40]:

```
from nltk import word_tokenize

train_data["tokenized"]= train_data.lower_text.map(word_tokenize)
test_data["tokenized"]= test_data.lower_text.map(word_tokenize)
```

In [41]:

```
from nltk.corpus import stopwords
from string import punctuation

def remove_stop(strings, stop_list):
    classed=[s for s in strings if s not in stop_list]
    return classed

stop=stopwords.words('english')
stop_punc=list(set(punctuation)) + stop

train_data['selected']= train_data.tokenized.map(lambda df: remove_stop(df, stop_punc)
test_data['selected']= test_data.tokenized.map(lambda df: remove_stop(df, stop_punc))
```

In [42]:

```
from nltk.stem import PorterStemmer
def normalize(text):
    return " ".join(text)

stemmer=PorterStemmer()

train_data['stemmed']=train_data.selected.map(lambda xs: [stemmer.stem(x) for x in xs]
train_data['normalized']=train_data.stemmed.apply(normalize)

test_data['stemmed']=test_data.selected.map(lambda xs: [stemmer.stem(x)for x in xs])
test_data['normalized']=test_data.stemmed.apply(normalize)
```

In [43]:

```
from tensorflow.keras.preprocessing.text import Tokenizer
tokenizer=Tokenizer(num_words=10000)
tokenizer.fit_on_texts(train_data.normalized)

tokenized_train=tokenizer.texts_to_sequences(train_data.normalized)
tokenized_test=tokenizer.texts_to_sequences(test_data.normalized)
```

In [44]:

```
tokenizer.word_index.keys().__len__()
```

Out[44]:

```
654
```

In [45]:

```
from tensorflow.keras.preprocessing.sequence import pad_sequences
train_padded=pad_sequences(tokenized_train, maxlen=20, padding='pre')
test_padded=pad_sequences(tokenized_test, maxlen=20, padding='pre')
```

In [46]:

```
train_padded.shape
```

Out[46]:

```
(4939, 20)
```

In [47]:

```
def transform_x(data, tokenizer):
    output_shape=[data.shape[0],
                  data.shape[1],
                  tokenizer.word_index.keys().__len__()]
    results= np.zeros(output_shape)

    for i in range(data.shape[0]):
        for ii in range(data.shape[1]):
            results[i, ii, data[i, ii]-1]=1
    return results

xtr_transformed=transform_x(train_padded, tokenizer)
xts_transformed=transform_x(test_padded, tokenizer)
```

In [48]:

```
from tensorflow.keras.layers import Dense, LSTM, BatchNormalization, Dropout, Input
from tensorflow.keras.optimizers import Adam
from tensorflow.keras.losses import CategoricalCrossentropy as CC
from tensorflow.keras.activations import relu, softmax
from tensorflow.keras.initializers import he_uniform, glorot_uniform
from tensorflow.keras.metrics import AUC
from tensorflow.keras import Model
from tensorflow.keras.regularizers import l2


class LSTMModel(object):

    def build_model(self, input_dim, output_shape, steps, dropout_rate, kernel_regula
        input_layer= Input(shape= (steps, input_dim))

        #make lstm_layer
        lstm= LSTM(units= steps)(input_layer)
        dense_1= Dense(output_shape, kernel_initializer= he_uniform(),
                       bias_initializer= "zeros",
                       kernel_regularizer= l2(l= kernel_regularizer),
                       bias_regularizer= l2(l= bias_regularizer))(lstm)
        x= BatchNormalization()(dense_1)
        x= relu(x)
        x= Dropout(rate= dropout_rate)(x)
        o= Dense(output_shape, kernel_initializer= glorot_uniform(),
                 bias_initializer= "zeros",
                 kernel_regularizer= l2(l= kernel_regularizer),
                 bias_regularizer= l2(l= bias_regularizer))(dense_1)
        o= BatchNormalization()(o)
        output= softmax(o, axis= 1)

        loss= CC()
        metrics= AUC()
        optimizer= Adam()
        self.model= Model(inputs= [input_layer], outputs= [output])
        self.model.compile(optimizer= optimizer, loss= loss, metrics= [metrics])


    def train(self, x, y, validation_split, epochs):
        self.model.fit(x, y, validation_split= validation_split, epochs= epochs)

    def predict(self, x):
        return self.model.predict(x)
```

In [49]:

```
steps=xtr_transformed.shape[1]
dim=xtr_transformed.shape[2]
output_shape=ytr_encoded.shape[1]

model=LSTMModel()
model.build_model(input_dim=dim,
                  output_shape=output_shape,
                  steps=steps,
                  dropout_rate=0.5,
                  bias_regularizer=0.3,
                  kernel_regularizer=0.3)
```

In [50]:

```
model.train(xtr_transformed, ytr_encoded, 0.2, 60)
```

```
Epoch 1/60
124/124 [==============================] - 5s 21ms/step - loss: 6.9890 - auc: 0.7541 -
val_loss: 5.2727 - val_auc: 0.8697
Epoch 2/60
124/124 [==============================] - 2s 15ms/step - loss: 3.9138 - auc: 0.9456 -
val_loss: 3.2801 - val_auc: 0.9646
Epoch 3/60
124/124 [==============================] - 2s 16ms/step - loss: 2.3535 - auc: 0.9762 -
val_loss: 2.2473 - val_auc: 0.9512
```

```
Epoch 4/60
124/124 [==============================] - 2s 16ms/step - loss: 1.5406 - auc: 0.9877 -
val_loss: 2.0054 - val_auc: 0.8637
Epoch 5/60
124/124 [==============================] - 2s 16ms/step - loss: 1.1348 - auc: 0.9905 -
val_loss: 1.6535 - val_auc: 0.8905
Epoch 6/60
124/124 [==============================] - 2s 16ms/step - loss: 0.9098 - auc: 0.9941 -
val_loss: 0.9878 - val_auc: 0.9782
Epoch 7/60
124/124 [==============================] - 2s 16ms/step - loss: 0.7803 - auc: 0.9951 -
val_loss: 0.9267 - val_auc: 0.9777
Epoch 8/60
124/124 [==============================] - 2s 14ms/step - loss: 0.6922 - auc: 0.9957 -
val_loss: 0.7734 - val_auc: 0.9866
Epoch 9/60
124/124 [==============================] - 2s 17ms/step - loss: 0.6229 - auc: 0.9973 -
val_loss: 0.7804 - val_auc: 0.9864
Epoch 10/60
124/124 [==============================] - 2s 17ms/step - loss: 0.5670 - auc: 0.9985 -
val_loss: 0.7645 - val_auc: 0.9868
Epoch 11/60
124/124 [==============================] - 2s 16ms/step - loss: 0.5054 - auc: 0.9985 -
val_loss: 0.6055 - val_auc: 0.9908
Epoch 12/60
124/124 [==============================] - 2s 14ms/step - loss: 0.4663 - auc: 0.9988 -
val_loss: 0.6738 - val_auc: 0.9888
Epoch 13/60
124/124 [==============================] - 2s 17ms/step - loss: 0.4369 - auc: 0.9988 -
val_loss: 0.5595 - val_auc: 0.9915
Epoch 14/60
124/124 [==============================] - 2s 16ms/step - loss: 0.4059 - auc: 0.9989 -
val_loss: 0.5972 - val_auc: 0.9907
Epoch 15/60
124/124 [==============================] - 2s 15ms/step - loss: 0.3760 - auc: 0.9990 -
val_loss: 0.5297 - val_auc: 0.9917
Epoch 16/60
124/124 [==============================] - 2s 15ms/step - loss: 0.3577 - auc: 0.9993 -
val_loss: 0.5295 - val_auc: 0.9916
Epoch 17/60
124/124 [==============================] - 2s 14ms/step - loss: 0.3374 - auc: 0.9994 -
val_loss: 0.4395 - val_auc: 0.9935
Epoch 18/60
124/124 [==============================] - 2s 15ms/step - loss: 0.3129 - auc: 0.9993 -
val_loss: 0.4377 - val_auc: 0.9926
Epoch 19/60
124/124 [==============================] - 2s 15ms/step - loss: 0.2943 - auc: 0.9994 -
val_loss: 0.4566 - val_auc: 0.9931
Epoch 20/60
124/124 [==============================] - 2s 14ms/step - loss: 0.2869 - auc: 0.9996 -
val_loss: 0.4159 - val_auc: 0.9935
Epoch 21/60
124/124 [==============================] - 2s 15ms/step - loss: 0.2775 - auc: 0.9994 -
val_loss: 0.4507 - val_auc: 0.9930
Epoch 22/60
124/124 [==============================] - 2s 15ms/step - loss: 0.2630 - auc: 0.9996 -
val_loss: 0.3984 - val_auc: 0.9939
Epoch 23/60
124/124 [==============================] - 2s 15ms/step - loss: 0.2505 - auc: 0.9996 -
val_loss: 0.3542 - val_auc: 0.9956
Epoch 24/60
124/124 [==============================] - 2s 16ms/step - loss: 0.2403 - auc: 0.9997 -
val_loss: 0.3584 - val_auc: 0.9955
Epoch 25/60
124/124 [==============================] - 2s 13ms/step - loss: 0.2276 - auc: 0.9998 -
val_loss: 0.3255 - val_auc: 0.9957
Epoch 26/60
124/124 [==============================] - 2s 16ms/step - loss: 0.2221 - auc: 0.9997 -
val_loss: 0.3321 - val_auc: 0.9960
Epoch 27/60
124/124 [==============================] - 2s 16ms/step - loss: 0.2143 - auc: 0.9996 -
val_loss: 0.3215 - val_auc: 0.9962
Epoch 28/60
124/124 [==============================] - 2s 16ms/step - loss: 0.2060 - auc: 0.9996 -
val_loss: 0.3129 - val_auc: 0.9955
Epoch 29/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1958 - auc: 0.9998 -
val_loss: 0.2804 - val_auc: 0.9967
Epoch 30/60
124/124 [==============================] - 2s 17ms/step - loss: 0.1934 - auc: 0.9998 -
val_loss: 0.3018 - val_auc: 0.9966
Epoch 31/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1858 - auc: 0.9998 -
val_loss: 0.2747 - val_auc: 0.9964
Epoch 32/60
124/124 [==============================] - 2s 17ms/step - loss: 0.1731 - auc: 0.9998 -
val_loss: 0.2766 - val_auc: 0.9960
Epoch 33/60
124/124 [==============================] - 2s 13ms/step - loss: 0.1707 - auc: 0.9999 -
val_loss: 0.2584 - val_auc: 0.9968
Epoch 34/60
124/124 [==============================] - 2s 15ms/step - loss: 0.1665 - auc: 0.9998 -
val_loss: 0.2821 - val_auc: 0.9961
Epoch 35/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1661 - auc: 0.9999 -
val_loss: 0.2456 - val_auc: 0.9971
Epoch 36/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1601 - auc: 0.9997 -
val_loss: 0.2297 - val_auc: 0.9972
Epoch 37/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1506 - auc: 0.9999 -
val_loss: 0.2281 - val_auc: 0.9970
Epoch 38/60
124/124 [==============================] - 2s 15ms/step - loss: 0.1484 - auc: 0.9999 -
val_loss: 0.2207 - val_auc: 0.9967
Epoch 39/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1439 - auc: 0.9999 -
val_loss: 0.2252 - val_auc: 0.9974
Epoch 40/60
124/124 [==============================] - 2s 17ms/step - loss: 0.1408 - auc: 0.9999 -
val_loss: 0.2152 - val_auc: 0.9971
Epoch 41/60
124/124 [==============================] - 2s 15ms/step - loss: 0.1363 - auc: 0.9999 -
val_loss: 0.2267 - val_auc: 0.9966
Epoch 42/60
124/124 [==============================] - 1s 10ms/step - loss: 0.1339 - auc: 0.9999 -
val_loss: 0.2173 - val_auc: 0.9969
Epoch 43/60
124/124 [==============================] - 1s 11ms/step - loss: 0.1293 - auc: 0.9999 -
val_loss: 0.2101 - val_auc: 0.9966
Epoch 44/60
124/124 [==============================] - 1s 10ms/step - loss: 0.1279 - auc: 0.9998 -
val_loss: 0.2118 - val_auc: 0.9968
Epoch 45/60
124/124 [==============================] - 2s 13ms/step - loss: 0.1241 - auc: 0.9999 -
val_loss: 0.1939 - val_auc: 0.9971
Epoch 46/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1204 - auc: 0.9999 -
val_loss: 0.2020 - val_auc: 0.9965
Epoch 47/60
124/124 [==============================] - 2s 15ms/step - loss: 0.1187 - auc: 1.0000 -
val_loss: 0.2005 - val_auc: 0.9971
Epoch 48/60
124/124 [==============================] - 2s 15ms/step - loss: 0.1170 - auc: 0.9999 -
val_loss: 0.1922 - val_auc: 0.9972
Epoch 49/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1144 - auc: 1.0000 -
val_loss: 0.2036 - val_auc: 0.9968
Epoch 50/60
124/124 [==============================] - 2s 16ms/step - loss: 0.1128 - auc: 1.0000 -
val_loss: 0.1870 - val_auc: 0.9968
Epoch 51/60
124/124 [==============================] - 1s 12ms/step - loss: 0.1097 - auc: 1.0000 -
val_loss: 0.1807 - val_auc: 0.9960
Epoch 52/60
124/124 [==============================] - 2s 15ms/step - loss: 0.1061 - auc: 1.0000 -
val_loss: 0.2123 - val_auc: 0.9945
Epoch 53/60
124/124 [==============================] - 2s 15ms/step - loss: 0.1091 - auc: 0.9999 -
val_loss: 0.1809 - val_auc: 0.9963
Epoch 54/60
124/124 [==============================] - 2s 14ms/step - loss: 0.1023 - auc: 1.0000 -
val_loss: 0.1824 - val_auc: 0.9967
Epoch 55/60
124/124 [==============================] - 2s 14ms/step - loss: 0.0982 - auc: 1.0000 -
val_loss: 0.1762 - val_auc: 0.9954
Epoch 56/60
124/124 [==============================] - 2s 14ms/step - loss: 0.0968 - auc: 1.0000 -
val_loss: 0.1694 - val_auc: 0.9966
Epoch 57/60
124/124 [==============================] - 2s 18ms/step - loss: 0.0939 - auc: 1.0000 -
val_loss: 0.1773 - val_auc: 0.9959
Epoch 58/60
124/124 [==============================] - 2s 17ms/step - loss: 0.0925 - auc: 1.0000 -
val_loss: 0.1690 - val_auc: 0.9965
Epoch 59/60
124/124 [==============================] - 2s 17ms/step - loss: 0.0924 - auc: 0.9998 -
val_loss: 0.1652 - val_auc: 0.9970
Epoch 60/60
124/124 [==============================] - 2s 14ms/step - loss: 0.0897 - auc: 1.0000 -
val_loss: 0.1868 - val_auc: 0.9958
```

In [51]:

```
from sklearn.metrics import classification_report
prediction=y_encoder.inverse_transform(model.predict(xtr_transformed))
print(classification_report(train_data.target, prediction))
```

```
                     precision    recall  f1-score   support

  atis_abbreviation       0.85      1.00      0.92       147
      atis_aircraft       0.97      0.94      0.96        81
       atis_airfare       1.00      0.99      0.99       423
       atis_airline       0.99      0.87      0.93       157
        atis_flight       1.00      1.00      1.00      3666
   atis_flight_time       0.96      0.96      0.96       108
atis_ground_service       0.97      1.00      0.99       255
      atis_quantity       1.00      1.00      1.00       102

           accuracy                           0.99      4939
          macro avg       0.97      0.97      0.97      4939
       weighted avg       0.99      0.99      0.99      4939
```

By programming through LSTM algorithm we can see the training data accuracy is 98%. So the training is recognized well by the library. The next step is whether this can be same in test data or not.

In [52]:

```
from sklearn.metrics import classification_report

prediction_test= y_encoder.inverse_transform(model.predict(xts_transformed))
print(classification_report(test_data.target, prediction_test))
```

```
                     precision    recall  f1-score   support

  atis_abbreviation       0.60      1.00      0.75        33
      atis_aircraft       0.83      0.56      0.67         9
       atis_airfare       1.00      0.92      0.96        48
       atis_airline       1.00      0.42      0.59        38
        atis_flight       0.99      0.99      0.99       632
   atis_flight_time       1.00      1.00      1.00         1
atis_ground_service       0.97      0.97      0.97        36
      atis_quantity       0.38      1.00      0.55         3

           accuracy                           0.95       800
          macro avg       0.85      0.86      0.81       800
       weighted avg       0.97      0.95      0.95       800
```

LSTM test data accuracy is same as train data, which is 98%. This means on an average this model will give 98% accurate data.

In [ ]:

Intent Classification using Spacy

In [53]:

```
import numpy as np
import pandas as pd
import os
import spacy
import csv
```

The library Spacy is also one of the most used library for intent classifiers. The following experiment is a failed experiment because I need, "en_vectors_we_lg" and this doesn't supports in the latest version of Spacy.

In [54]:

```
!python -m spacy download en_vectors_web_lg
!python -m spacy link en_vectors_web_lg en_vectors_web_lg
```

```
[x] No compatible package found for 'en_vectors_web_lg' (spaCy v3.2.4)
```

```
2022-04-28 14:50:48.321987: W tensorflow/stream_executor/platform/default/dso_loader.c
c:64] Could not load dynamic library 'cudart64_110.dll'; dlerror: cudart64_110.dll not
found
2022-04-28 14:50:48.322023: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ignor
e above cudart dlerror if you do not have a GPU set up on your machine.
[!] As of spaCy v3.0, model symlinks are not supported anymore. You can load
trained pipeline packages using their full names or from a directory path.
2022-04-28 14:50:57.250268: W tensorflow/stream_executor/platform/default/dso_loader.c
c:64] Could not load dynamic library 'cudart64_110.dll'; dlerror: cudart64_110.dll not
found
2022-04-28 14:50:57.250295: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ignor
e above cudart dlerror if you do not have a GPU set up on your machine.
DeprecationWarning: The command link is deprecated.
```

In [55]:

```
path=r'D:\Surrey\Semester\Semester 2\NLP'
```

In [56]:

```
def read_data(path):
    with open(path, 'r') as csvfile:
        readCSV=csv.reader(csvfile, delimiter=',')
        labels=[]
        sentences=[]
        for row in readCSV:
            label=row[0]
            sentence=row[1]
            labels.append(label)
            sentences.append(sentence)
    return sentences, labels
```

In [57]:

```
sentences_test, labels_test=read_data(r'D:\Surrey\Semester\Semester 2\NLP\atis_intents
print(sentences_test[:3], '\n')
print(labels_test[:3])
```

```
[' i would like to find a flight from charlotte to las vegas that makes a stop in st.
louis', ' on april first i need a ticket from tacoma to san jose departing before 7 a
m', ' on april first i need a flight going from phoenix to san diego']

['atis_flight', 'atis_airfare', 'atis_flight']
```

In [58]:

```
sentences_train, labels_train = read_data(r'D:\Surrey\Semester\Semester 2\NLP\atis_int
```

In [59]:

```
df1=pd.read_csv(r'D:\Surrey\Semester\Semester 2\NLP\atis_intents_train.csv', delimite
df1.dataframeName='atis_intents_train.csv'
nRow, nCol,= df1.shape
print(f'{nRow} rows & {nCol} columns')
```

```
4833 rows & 2 columns
```

In [60]:

```
df1.sample(10)
```

Out[60]:

	atis_flight	i want to fly from boston at 838 am and arrive in denver at 1110 in the morning
795	atis_flight	flights from cleveland to kansas city on monday
4022	atis_ground_service	what ground transportation is available at th...
393	atis_abbreviation	what is mco
2865	atis_flight	show me the flights from baltimore to oakland
274	atis_flight	i need a flight this sunday from miami to las...
280	atis_flight	show me the flights from baltimore to oakland
4826	atis_flight	please list all flights from san francisco to...
3460	atis_flight	i want to go from boston to oakland
3333	atis_airfare	what's the lowest round trip fare from dallas...
4054	atis_flight	show me the flights from atlanta to boston

In [61]:

```
df1.describe()
```

Out[61]:

	atis_flight	i want to fly from boston at 838 am and arrive in denver at 1110 in the morning
count	4833	4833
unique	8	4498
top	atis_flight	what is fare code h
freq	3665	8

In [62]:

```
def label_encoding(labels):
    # Calculate the length of labels

    n_labels = len(labels)
    print('Number of labels :-',n_labels)

    from sklearn.preprocessing import LabelEncoder
    # instantiate labelencoder object
    le = LabelEncoder()
    y =le.fit_transform(labels)
    print(y[:100])
    print('Length of y :- ',y.shape)
    return y

train_y = label_encoding(labels_train)
test_y = label_encoding(labels_test)
```

```
Number of labels :- 4834
[4 4 5 2 2 4 1 4 4 6 4 4 4 4 2 6 4 4 4 4 4 4 1 2 4 3 4 6 4 2 4 4 4 4 2 3 4
 4 4 4 3 3 4 3 6 0 4 4 5 4 4 4 0 4 4 4 4 4 3 4 6 3 4 4 4 4 0 4 4 4 4 1 2 4
 4 4 4 4 4 3 4 4 4 4 4 4 4 2 4 6 7 4 4 4 4 4 4 4 4]
Length of y :-  (4834,)
Number of labels :- 800
[4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 6 4 4 4 4 4
 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 2 3 5]
Length of y :-  (800,)
```

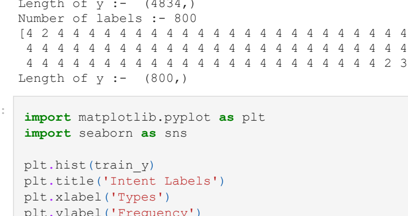
In [63]:

```
import matplotlib.pyplot as plt
import seaborn as sns

plt.hist(train_y)
plt.title('Intent Labels')
plt.xlabel('Types')
plt.ylabel('Frequency')
#df1['atis_flight'].hist()
```

Out[63]:

```
Text(0, 0.5, 'Frequency')
```



The above visualisation shows the number of intent present in the dataset. As the program needs some specific library to go forward. This experiment is halted in between.

References

Links : -

1. https://blog.vsoftconsulting.com/blog/intent-classification-and-its-significance-in-chatbot-develop

2. https://paperswithcode.com/task/intent-classification

3. https://dasha.ai/en-us/blog/intent-classification

4. https://www.helpshift.com/glossary/intent-classification/

5. https://monkeylearn.com/blog/intent-classification/#:~:text=Intent classification is the automated,, Unsubscribe, and Demo Request.

This is first python file in which I have tried various experiments using Python NLTK libraries. The second Python file is demonstration of Intent based chatbot, the file will be executed through different inbuilt python file. The execution direction will be given at the start of the program.

The folder named as, 'Intent Chatbot' consists of 4 different python files which are related to each other. There is a separate 'ReadMe.txt' file on how to execute that folder.