Week 3 Programming Assignment

July 30, 2021

1 Programming Assignment

1.1 Model validation on the Iris dataset

1.1.1 Instructions

In this notebook, you will build, compile and fit a neural network model to the Iris dataset. You will also implement validation, regularisation and callbacks to improve your model.

Some code cells are provided you in the notebook. You should avoid editing provided code, and make sure to execute the cells in order to avoid unexpected errors. Some cells begin with the line:

`#### GRADED CELL ####`

Don't move or edit this first line - this is what the automatic grader looks for to recognise graded cells. These cells require you to write your own code to complete them, and are automatically graded when you submit the notebook. Don't edit the function name or signature provided in these cells, otherwise the automatic grader might not function properly. Inside these graded cells, you can use any functions or classes that are imported below, but make sure you don't use any variables that are outside the scope of the function.

1.1.2 How to submit

Complete all the tasks you are asked for in the worksheet. When you have finished and are happy with your code, press the **Submit Assignment** button at the top of this notebook.

1.1.3 Let's get started!

We'll start running some imports, and loading the dataset. Do not edit the existing imports in the following cell. If you would like to make further Tensorflow imports, you should add them here.

In [83]:
```
#### PACKAGE IMPORTS ####

# Run this cell first to import all required packages. Do not make any imports elsewh
from numpy.random import seed
seed(8)
import tensorflow as tf
import numpy as np
import matplotlib.pyplot as plt
from sklearn import datasets, model_selection
```

```
%matplotlib inline

# If you would like to make further imports from tensorflow, add them here
#from tensorflow.keras.callbacks import Callbacks
from sklearn.model_selection import train_test_split
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Flatten, Conv2D, MaxPooling2D, Dropout, Ba
```

The Iris dataset In this assignment, you will use the Iris dataset. It consists of 50 samples from each of three species of Iris (Iris setosa, Iris virginica and Iris versicolor). Four features were measured from each sample: the length and the width of the sepals and petals, in centimeters. For a reference, see the following papers:

- R. A. Fisher. "The use of multiple measurements in taxonomic problems". Annals of Eugenics. 7 (2): 179–188, 1936.

Your goal is to construct a neural network that classifies each sample into the correct class, as well as applying validation and regularisation techniques.

Load and preprocess the data First read in the Iris dataset using `datasets.load_iris()`, and split the dataset into training and test sets.

In [11]:
```
#### GRADED CELL ####

# Complete the following function.
# Make sure to not change the function name or arguments.

def read_in_and_split_data(iris_data):
    """
    This function takes the Iris dataset as loaded by sklearn.datasets.load_iris(), a
    splits so that the training set includes 90% of the full dataset, with the test s
    making up the remaining 10%.
    Your function should return a tuple (train_data, test_data, train_targets, test_t
    of appropriately split training and test data and targets.

    If you would like to import any further packages to aid you in this task, please
    Package Imports cell above.
    """
    data = iris_data["data"]
    targets = iris_data["target"]
    train_data, test_data, train_targets, test_targets = train_test_split(data, targe

    return(train_data, test_data, train_targets, test_targets)
```

In [12]:
```
# Run your function to generate the test and training data.

iris_data = datasets.load_iris()
train_data, test_data, train_targets, test_targets = read_in_and_split_data(iris_data
```

We will now convert the training and test targets using a one hot encoder.

In [13]:
```
# Convert targets to a one-hot encoding

train_targets = tf.keras.utils.to_categorical(np.array(train_targets))
test_targets = tf.keras.utils.to_categorical(np.array(test_targets))
```

Build the neural network model You can now construct a model to fit to the data. Using the Sequential API, build your model according to the following specifications:

- The model should use the `input_shape` in the function argument to set the input size in the first layer.
- The first layer should be a dense layer with 64 units.
- The weights of the first layer should be initialised with the He uniform initializer.
- The biases of the first layer should be all initially equal to one.
- There should then be a further four dense layers, each with 128 units.
- This should be followed with four dense layers, each with 64 units.
- All of these Dense layers should use the ReLU activation function.
- The output Dense layer should have 3 units and the softmax activation function.

In total, the network should have 10 layers.

In [36]:
```
#### GRADED CELL ####

# Complete the following function.
# Make sure to not change the function name or arguments.

def get_model(input_shape):
    """
    This function should build a Sequential model according to the above specificatio
    weights are initialised by providing the input_shape argument in the first layer,
    function argument.
    Your function should return the model.
    """
    model = Sequential([
        Dense(64, activation='relu', kernel_initializer = 'he_uniform', bias_initiali
        Dense(128, activation='relu'),
        Dense(128, activation='relu'),
        Dense(128, activation='relu'),
        Dense(128, activation='relu'),
        Dense(64, activation='relu'),
        Dense(64, activation='relu'),
        Dense(64, activation='relu'),
        Dense(64, activation='relu'),
        Dense(3, activation='softmax')
    ])

    return(model)
```

In [37]:
```
# Run your function to get the model

model = get_model(train_data[0].shape)
```

Compile the model You should now compile the model using the `compile` method. Remember that you need to specify an optimizer, a loss function and a metric to judge the performance of your model.

In [38]:
```
#### GRADED CELL ####

# Complete the following function.
# Make sure to not change the function name or arguments.

def compile_model(model):
    """
    This function takes in the model returned from your get_model function, and compi
    loss function and metric.
    Compile the model using the Adam optimiser (with learning rate set to 0.0001),
    the categorical crossentropy loss function and accuracy as the only metric.
    Your function doesn't need to return anything; the model will be compiled in-plac
    """
    optimizer = tf.keras.optimizers.Adam(learning_rate=0.0001)
    loss = tf.keras.losses.CategoricalCrossentropy()
    metrics= tf.keras.metrics.Accuracy
    model.compile(optimizer=optimizer, loss=loss, metrics=['acc'])
   # model.compile(optimizer=optimizer, loss=loss, metrics=metrics)
```

In [39]:
```
# Run your function to compile the model

compile_model(model)
```

Fit the model to the training data Now you should train the model on the Iris dataset, using the model's `fit` method. * Run the training for a fixed number of epochs, given by the function's `epochs` argument. * Return the training history to be used for plotting the learning curves. * Set the batch size to 40. * Set the validation set to be 15% of the training set.

In [44]:
```
#### GRADED CELL ####

# Complete the following function.
# Make sure to not change the function name or arguments.

def train_model(model, train_data, train_targets, epochs):
    """
    This function should train the model for the given number of epochs on the
    train_data and train_targets.
    Your function should return the training history, as returned by model.fit.
    """
```

```
    history = model.fit(train_data, train_targets, epochs=epochs, batch_size=40, vali

    return(history)
```

Run the following cell to run the training for 800 epochs.

```
In [45]: # Run your function to train the model

    history = train_model(model, train_data, train_targets, epochs=800)
```

```
Train on 114 samples, validate on 21 samples
Epoch 1/800
114/114 - 0s - loss: 0.0134 - acc: 1.0000 - val_loss: 0.1734 - val_acc: 0.9524
Epoch 2/800
114/114 - 0s - loss: 0.0164 - acc: 0.9912 - val_loss: 0.1763 - val_acc: 0.9524
Epoch 3/800
114/114 - 0s - loss: 0.0138 - acc: 1.0000 - val_loss: 0.1883 - val_acc: 0.9048
Epoch 4/800
114/114 - 0s - loss: 0.0127 - acc: 1.0000 - val_loss: 0.1986 - val_acc: 0.9048
Epoch 5/800
114/114 - 0s - loss: 0.0111 - acc: 1.0000 - val_loss: 0.1951 - val_acc: 0.9524
Epoch 6/800
114/114 - 0s - loss: 0.0127 - acc: 1.0000 - val_loss: 0.1995 - val_acc: 0.9524
Epoch 7/800
114/114 - 0s - loss: 0.0101 - acc: 1.0000 - val_loss: 0.2105 - val_acc: 0.9524
Epoch 8/800
114/114 - 0s - loss: 0.0098 - acc: 1.0000 - val_loss: 0.2290 - val_acc: 0.9048
Epoch 9/800
114/114 - 0s - loss: 0.0113 - acc: 1.0000 - val_loss: 0.2268 - val_acc: 0.9048
Epoch 10/800
114/114 - 0s - loss: 0.0092 - acc: 1.0000 - val_loss: 0.2247 - val_acc: 0.9524
Epoch 11/800
114/114 - 0s - loss: 0.0096 - acc: 1.0000 - val_loss: 0.2280 - val_acc: 0.9524
Epoch 12/800
114/114 - 0s - loss: 0.0093 - acc: 1.0000 - val_loss: 0.2358 - val_acc: 0.9524
Epoch 13/800
114/114 - 0s - loss: 0.0091 - acc: 1.0000 - val_loss: 0.2382 - val_acc: 0.9524
Epoch 14/800
114/114 - 0s - loss: 0.0081 - acc: 1.0000 - val_loss: 0.2451 - val_acc: 0.9048
Epoch 15/800
114/114 - 0s - loss: 0.0083 - acc: 1.0000 - val_loss: 0.2491 - val_acc: 0.9048
Epoch 16/800
114/114 - 0s - loss: 0.0079 - acc: 1.0000 - val_loss: 0.2484 - val_acc: 0.9524
Epoch 17/800
114/114 - 0s - loss: 0.0080 - acc: 1.0000 - val_loss: 0.2520 - val_acc: 0.9524
Epoch 18/800
114/114 - 0s - loss: 0.0078 - acc: 1.0000 - val_loss: 0.2524 - val_acc: 0.9524
```

```
Epoch 19/800
114/114 - 0s - loss: 0.0077 - acc: 1.0000 - val_loss: 0.2574 - val_acc: 0.9524
Epoch 20/800
114/114 - 0s - loss: 0.0072 - acc: 1.0000 - val_loss: 0.2639 - val_acc: 0.9048
Epoch 21/800
114/114 - 0s - loss: 0.0105 - acc: 1.0000 - val_loss: 0.2719 - val_acc: 0.9048
Epoch 22/800
114/114 - 0s - loss: 0.0077 - acc: 1.0000 - val_loss: 0.2605 - val_acc: 0.9524
Epoch 23/800
114/114 - 0s - loss: 0.0078 - acc: 1.0000 - val_loss: 0.2628 - val_acc: 0.9524
Epoch 24/800
114/114 - 0s - loss: 0.0081 - acc: 1.0000 - val_loss: 0.2646 - val_acc: 0.9524
Epoch 25/800
114/114 - 0s - loss: 0.0075 - acc: 1.0000 - val_loss: 0.2815 - val_acc: 0.9048
Epoch 26/800
114/114 - 0s - loss: 0.0086 - acc: 1.0000 - val_loss: 0.2826 - val_acc: 0.9048
Epoch 27/800
114/114 - 0s - loss: 0.0083 - acc: 1.0000 - val_loss: 0.2681 - val_acc: 0.9524
Epoch 28/800
114/114 - 0s - loss: 0.0095 - acc: 1.0000 - val_loss: 0.2676 - val_acc: 0.9524
Epoch 29/800
114/114 - 0s - loss: 0.0083 - acc: 1.0000 - val_loss: 0.2812 - val_acc: 0.9048
Epoch 30/800
114/114 - 0s - loss: 0.0073 - acc: 1.0000 - val_loss: 0.2879 - val_acc: 0.9048
Epoch 31/800
114/114 - 0s - loss: 0.0072 - acc: 1.0000 - val_loss: 0.2780 - val_acc: 0.9048
Epoch 32/800
114/114 - 0s - loss: 0.0073 - acc: 1.0000 - val_loss: 0.2746 - val_acc: 0.9524
Epoch 33/800
114/114 - 0s - loss: 0.0069 - acc: 1.0000 - val_loss: 0.2802 - val_acc: 0.9048
Epoch 34/800
114/114 - 0s - loss: 0.0064 - acc: 1.0000 - val_loss: 0.2873 - val_acc: 0.9048
Epoch 35/800
114/114 - 0s - loss: 0.0065 - acc: 1.0000 - val_loss: 0.2866 - val_acc: 0.9048
Epoch 36/800
114/114 - 0s - loss: 0.0064 - acc: 1.0000 - val_loss: 0.2831 - val_acc: 0.9048
Epoch 37/800
114/114 - 0s - loss: 0.0064 - acc: 1.0000 - val_loss: 0.2854 - val_acc: 0.9048
Epoch 38/800
114/114 - 0s - loss: 0.0072 - acc: 1.0000 - val_loss: 0.2831 - val_acc: 0.9524
Epoch 39/800
114/114 - 0s - loss: 0.0066 - acc: 1.0000 - val_loss: 0.2935 - val_acc: 0.9048
Epoch 40/800
114/114 - 0s - loss: 0.0068 - acc: 1.0000 - val_loss: 0.2933 - val_acc: 0.9048
Epoch 41/800
114/114 - 0s - loss: 0.0063 - acc: 1.0000 - val_loss: 0.2856 - val_acc: 0.9524
Epoch 42/800
114/114 - 0s - loss: 0.0061 - acc: 1.0000 - val_loss: 0.2857 - val_acc: 0.9524
```

```
Epoch 43/800
114/114 - 0s - loss: 0.0064 - acc: 1.0000 - val_loss: 0.2889 - val_acc: 0.9048
Epoch 44/800
114/114 - 0s - loss: 0.0066 - acc: 1.0000 - val_loss: 0.2992 - val_acc: 0.9048
Epoch 45/800
114/114 - 0s - loss: 0.0071 - acc: 1.0000 - val_loss: 0.2939 - val_acc: 0.9048
Epoch 46/800
114/114 - 0s - loss: 0.0070 - acc: 1.0000 - val_loss: 0.2860 - val_acc: 0.9524
Epoch 47/800
114/114 - 0s - loss: 0.0061 - acc: 1.0000 - val_loss: 0.2918 - val_acc: 0.9048
Epoch 48/800
114/114 - 0s - loss: 0.0065 - acc: 1.0000 - val_loss: 0.3054 - val_acc: 0.9048
Epoch 49/800
114/114 - 0s - loss: 0.0070 - acc: 1.0000 - val_loss: 0.2959 - val_acc: 0.9048
Epoch 50/800
114/114 - 0s - loss: 0.0065 - acc: 1.0000 - val_loss: 0.2903 - val_acc: 0.9524
Epoch 51/800
114/114 - 0s - loss: 0.0057 - acc: 1.0000 - val_loss: 0.2955 - val_acc: 0.9048
Epoch 52/800
114/114 - 0s - loss: 0.0055 - acc: 1.0000 - val_loss: 0.3005 - val_acc: 0.9048
Epoch 53/800
114/114 - 0s - loss: 0.0057 - acc: 1.0000 - val_loss: 0.3030 - val_acc: 0.9048
Epoch 54/800
114/114 - 0s - loss: 0.0058 - acc: 1.0000 - val_loss: 0.3023 - val_acc: 0.9048
Epoch 55/800
114/114 - 0s - loss: 0.0055 - acc: 1.0000 - val_loss: 0.2962 - val_acc: 0.9524
Epoch 56/800
114/114 - 0s - loss: 0.0056 - acc: 1.0000 - val_loss: 0.2949 - val_acc: 0.9524
Epoch 57/800
114/114 - 0s - loss: 0.0057 - acc: 1.0000 - val_loss: 0.2981 - val_acc: 0.9524
Epoch 58/800
114/114 - 0s - loss: 0.0052 - acc: 1.0000 - val_loss: 0.3055 - val_acc: 0.9048
Epoch 59/800
114/114 - 0s - loss: 0.0059 - acc: 1.0000 - val_loss: 0.3103 - val_acc: 0.9048
Epoch 60/800
114/114 - 0s - loss: 0.0053 - acc: 1.0000 - val_loss: 0.3036 - val_acc: 0.9048
Epoch 61/800
114/114 - 0s - loss: 0.0050 - acc: 1.0000 - val_loss: 0.2987 - val_acc: 0.9524
Epoch 62/800
114/114 - 0s - loss: 0.0068 - acc: 1.0000 - val_loss: 0.2992 - val_acc: 0.9524
Epoch 63/800
114/114 - 0s - loss: 0.0046 - acc: 1.0000 - val_loss: 0.3122 - val_acc: 0.9048
Epoch 64/800
114/114 - 0s - loss: 0.0083 - acc: 1.0000 - val_loss: 0.3258 - val_acc: 0.9048
Epoch 65/800
114/114 - 0s - loss: 0.0058 - acc: 1.0000 - val_loss: 0.3053 - val_acc: 0.9048
Epoch 66/800
114/114 - 0s - loss: 0.0082 - acc: 1.0000 - val_loss: 0.2979 - val_acc: 0.9524
```

```
Epoch 67/800
114/114 - 0s - loss: 0.0060 - acc: 1.0000 - val_loss: 0.3151 - val_acc: 0.9048
Epoch 68/800
114/114 - 0s - loss: 0.0053 - acc: 1.0000 - val_loss: 0.3213 - val_acc: 0.9048
Epoch 69/800
114/114 - 0s - loss: 0.0059 - acc: 1.0000 - val_loss: 0.3166 - val_acc: 0.9048
Epoch 70/800
114/114 - 0s - loss: 0.0061 - acc: 1.0000 - val_loss: 0.3022 - val_acc: 0.9524
Epoch 71/800
114/114 - 0s - loss: 0.0057 - acc: 1.0000 - val_loss: 0.3050 - val_acc: 0.9524
Epoch 72/800
114/114 - 0s - loss: 0.0051 - acc: 1.0000 - val_loss: 0.3103 - val_acc: 0.9048
Epoch 73/800
114/114 - 0s - loss: 0.0050 - acc: 1.0000 - val_loss: 0.3211 - val_acc: 0.9048
Epoch 74/800
114/114 - 0s - loss: 0.0054 - acc: 1.0000 - val_loss: 0.3146 - val_acc: 0.9048
Epoch 75/800
114/114 - 0s - loss: 0.0049 - acc: 1.0000 - val_loss: 0.3091 - val_acc: 0.9524
Epoch 76/800
114/114 - 0s - loss: 0.0048 - acc: 1.0000 - val_loss: 0.3122 - val_acc: 0.9048
Epoch 77/800
114/114 - 0s - loss: 0.0055 - acc: 1.0000 - val_loss: 0.3185 - val_acc: 0.9048
Epoch 78/800
114/114 - 0s - loss: 0.0046 - acc: 1.0000 - val_loss: 0.3139 - val_acc: 0.9048
Epoch 79/800
114/114 - 0s - loss: 0.0058 - acc: 1.0000 - val_loss: 0.3101 - val_acc: 0.9524
Epoch 80/800
114/114 - 0s - loss: 0.0056 - acc: 1.0000 - val_loss: 0.3292 - val_acc: 0.9048
Epoch 81/800
114/114 - 0s - loss: 0.0056 - acc: 1.0000 - val_loss: 0.3246 - val_acc: 0.9048
Epoch 82/800
114/114 - 0s - loss: 0.0048 - acc: 1.0000 - val_loss: 0.3170 - val_acc: 0.9048
Epoch 83/800
114/114 - 0s - loss: 0.0047 - acc: 1.0000 - val_loss: 0.3144 - val_acc: 0.9524
Epoch 84/800
114/114 - 0s - loss: 0.0047 - acc: 1.0000 - val_loss: 0.3223 - val_acc: 0.9048
Epoch 85/800
114/114 - 0s - loss: 0.0049 - acc: 1.0000 - val_loss: 0.3251 - val_acc: 0.9048
Epoch 86/800
114/114 - 0s - loss: 0.0047 - acc: 1.0000 - val_loss: 0.3157 - val_acc: 0.9524
Epoch 87/800
114/114 - 0s - loss: 0.0046 - acc: 1.0000 - val_loss: 0.3178 - val_acc: 0.9048
Epoch 88/800
114/114 - 0s - loss: 0.0044 - acc: 1.0000 - val_loss: 0.3273 - val_acc: 0.9048
Epoch 89/800
114/114 - 0s - loss: 0.0044 - acc: 1.0000 - val_loss: 0.3279 - val_acc: 0.9048
Epoch 90/800
114/114 - 0s - loss: 0.0042 - acc: 1.0000 - val_loss: 0.3221 - val_acc: 0.9048
```

```
Epoch 91/800
114/114 - 0s - loss: 0.0045 - acc: 1.0000 - val_loss: 0.3218 - val_acc: 0.9048
Epoch 92/800
114/114 - 0s - loss: 0.0042 - acc: 1.0000 - val_loss: 0.3212 - val_acc: 0.9048
Epoch 93/800
114/114 - 0s - loss: 0.0043 - acc: 1.0000 - val_loss: 0.3216 - val_acc: 0.9048
Epoch 94/800
114/114 - 0s - loss: 0.0044 - acc: 1.0000 - val_loss: 0.3251 - val_acc: 0.9048
Epoch 95/800
114/114 - 0s - loss: 0.0043 - acc: 1.0000 - val_loss: 0.3351 - val_acc: 0.9048
Epoch 96/800
114/114 - 0s - loss: 0.0044 - acc: 1.0000 - val_loss: 0.3315 - val_acc: 0.9048
Epoch 97/800
114/114 - 0s - loss: 0.0041 - acc: 1.0000 - val_loss: 0.3250 - val_acc: 0.9048
Epoch 98/800
114/114 - 0s - loss: 0.0045 - acc: 1.0000 - val_loss: 0.3264 - val_acc: 0.9048
Epoch 99/800
114/114 - 0s - loss: 0.0042 - acc: 1.0000 - val_loss: 0.3316 - val_acc: 0.9048
Epoch 100/800
114/114 - 0s - loss: 0.0042 - acc: 1.0000 - val_loss: 0.3312 - val_acc: 0.9048
Epoch 101/800
114/114 - 0s - loss: 0.0042 - acc: 1.0000 - val_loss: 0.3257 - val_acc: 0.9048
Epoch 102/800
114/114 - 0s - loss: 0.0045 - acc: 1.0000 - val_loss: 0.3306 - val_acc: 0.9048
Epoch 103/800
114/114 - 0s - loss: 0.0042 - acc: 1.0000 - val_loss: 0.3282 - val_acc: 0.9048
Epoch 104/800
114/114 - 0s - loss: 0.0039 - acc: 1.0000 - val_loss: 0.3314 - val_acc: 0.9048
Epoch 105/800
114/114 - 0s - loss: 0.0038 - acc: 1.0000 - val_loss: 0.3342 - val_acc: 0.9048
Epoch 106/800
114/114 - 0s - loss: 0.0040 - acc: 1.0000 - val_loss: 0.3370 - val_acc: 0.9048
Epoch 107/800
114/114 - 0s - loss: 0.0041 - acc: 1.0000 - val_loss: 0.3340 - val_acc: 0.9048
Epoch 108/800
114/114 - 0s - loss: 0.0043 - acc: 1.0000 - val_loss: 0.3270 - val_acc: 0.9524
Epoch 109/800
114/114 - 0s - loss: 0.0040 - acc: 1.0000 - val_loss: 0.3365 - val_acc: 0.9048
Epoch 110/800
114/114 - 0s - loss: 0.0038 - acc: 1.0000 - val_loss: 0.3374 - val_acc: 0.9048
Epoch 111/800
114/114 - 0s - loss: 0.0037 - acc: 1.0000 - val_loss: 0.3344 - val_acc: 0.9048
Epoch 112/800
114/114 - 0s - loss: 0.0037 - acc: 1.0000 - val_loss: 0.3321 - val_acc: 0.9048
Epoch 113/800
114/114 - 0s - loss: 0.0038 - acc: 1.0000 - val_loss: 0.3306 - val_acc: 0.9048
Epoch 114/800
114/114 - 0s - loss: 0.0037 - acc: 1.0000 - val_loss: 0.3350 - val_acc: 0.9048
```

```
Epoch 115/800
114/114 - 0s - loss: 0.0040 - acc: 1.0000 - val_loss: 0.3442 - val_acc: 0.9048
Epoch 116/800
114/114 - 0s - loss: 0.0037 - acc: 1.0000 - val_loss: 0.3359 - val_acc: 0.9048
Epoch 117/800
114/114 - 0s - loss: 0.0035 - acc: 1.0000 - val_loss: 0.3321 - val_acc: 0.9048
Epoch 118/800
114/114 - 0s - loss: 0.0037 - acc: 1.0000 - val_loss: 0.3336 - val_acc: 0.9048
Epoch 119/800
114/114 - 0s - loss: 0.0037 - acc: 1.0000 - val_loss: 0.3378 - val_acc: 0.9048
Epoch 120/800
114/114 - 0s - loss: 0.0038 - acc: 1.0000 - val_loss: 0.3451 - val_acc: 0.9048
Epoch 121/800
114/114 - 0s - loss: 0.0040 - acc: 1.0000 - val_loss: 0.3435 - val_acc: 0.9048
Epoch 122/800
114/114 - 0s - loss: 0.0035 - acc: 1.0000 - val_loss: 0.3322 - val_acc: 0.9524
Epoch 123/800
114/114 - 0s - loss: 0.0038 - acc: 1.0000 - val_loss: 0.3356 - val_acc: 0.9048
Epoch 124/800
114/114 - 0s - loss: 0.0035 - acc: 1.0000 - val_loss: 0.3425 - val_acc: 0.9048
Epoch 125/800
114/114 - 0s - loss: 0.0034 - acc: 1.0000 - val_loss: 0.3471 - val_acc: 0.9048
Epoch 126/800
114/114 - 0s - loss: 0.0038 - acc: 1.0000 - val_loss: 0.3425 - val_acc: 0.9048
Epoch 127/800
114/114 - 0s - loss: 0.0037 - acc: 1.0000 - val_loss: 0.3406 - val_acc: 0.9048
Epoch 128/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3457 - val_acc: 0.9048
Epoch 129/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3452 - val_acc: 0.9048
Epoch 130/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3430 - val_acc: 0.9048
Epoch 131/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3432 - val_acc: 0.9048
Epoch 132/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3435 - val_acc: 0.9048
Epoch 133/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3412 - val_acc: 0.9048
Epoch 134/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3464 - val_acc: 0.9048
Epoch 135/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3511 - val_acc: 0.9048
Epoch 136/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3450 - val_acc: 0.9048
Epoch 137/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3477 - val_acc: 0.9048
Epoch 138/800
114/114 - 0s - loss: 0.0034 - acc: 1.0000 - val_loss: 0.3412 - val_acc: 0.9048
```

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Epoch 139/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3479 - val_acc: 0.9048
Epoch 140/800
114/114 - 0s - loss: 0.0032 - acc: 1.0000 - val_loss: 0.3514 - val_acc: 0.9048
Epoch 141/800
114/114 - 0s - loss: 0.0031 - acc: 1.0000 - val_loss: 0.3482 - val_acc: 0.9048
Epoch 142/800
114/114 - 0s - loss: 0.0034 - acc: 1.0000 - val_loss: 0.3442 - val_acc: 0.9048
Epoch 143/800
114/114 - 0s - loss: 0.0031 - acc: 1.0000 - val_loss: 0.3480 - val_acc: 0.9048
Epoch 144/800
114/114 - 0s - loss: 0.0031 - acc: 1.0000 - val_loss: 0.3488 - val_acc: 0.9048
Epoch 145/800
114/114 - 0s - loss: 0.0031 - acc: 1.0000 - val_loss: 0.3555 - val_acc: 0.9048
Epoch 146/800
114/114 - 0s - loss: 0.0033 - acc: 1.0000 - val_loss: 0.3493 - val_acc: 0.9048
Epoch 147/800
114/114 - 0s - loss: 0.0031 - acc: 1.0000 - val_loss: 0.3507 - val_acc: 0.9048
Epoch 148/800
114/114 - 0s - loss: 0.0030 - acc: 1.0000 - val_loss: 0.3506 - val_acc: 0.9048
Epoch 149/800
114/114 - 0s - loss: 0.0029 - acc: 1.0000 - val_loss: 0.3453 - val_acc: 0.9048
Epoch 150/800
114/114 - 0s - loss: 0.0030 - acc: 1.0000 - val_loss: 0.3486 - val_acc: 0.9048
Epoch 151/800
114/114 - 0s - loss: 0.0029 - acc: 1.0000 - val_loss: 0.3549 - val_acc: 0.9048
Epoch 152/800
114/114 - 0s - loss: 0.0029 - acc: 1.0000 - val_loss: 0.3551 - val_acc: 0.9048
Epoch 153/800
114/114 - 0s - loss: 0.0032 - acc: 1.0000 - val_loss: 0.3559 - val_acc: 0.9048
Epoch 154/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3474 - val_acc: 0.9048
Epoch 155/800
114/114 - 0s - loss: 0.0035 - acc: 1.0000 - val_loss: 0.3454 - val_acc: 0.9524
Epoch 156/800
114/114 - 0s - loss: 0.0030 - acc: 1.0000 - val_loss: 0.3596 - val_acc: 0.9048
Epoch 157/800
114/114 - 0s - loss: 0.0029 - acc: 1.0000 - val_loss: 0.3637 - val_acc: 0.9048
Epoch 158/800
114/114 - 0s - loss: 0.0029 - acc: 1.0000 - val_loss: 0.3561 - val_acc: 0.9048
Epoch 159/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3479 - val_acc: 0.9524
Epoch 160/800
114/114 - 0s - loss: 0.0032 - acc: 1.0000 - val_loss: 0.3488 - val_acc: 0.9524
Epoch 161/800
114/114 - 0s - loss: 0.0028 - acc: 1.0000 - val_loss: 0.3679 - val_acc: 0.9048
Epoch 162/800
114/114 - 0s - loss: 0.0030 - acc: 1.0000 - val_loss: 0.3687 - val_acc: 0.9048
```

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Epoch 163/800
114/114 - 0s - loss: 0.0029 - acc: 1.0000 - val_loss: 0.3552 - val_acc: 0.9048
Epoch 164/800
114/114 - 0s - loss: 0.0032 - acc: 1.0000 - val_loss: 0.3515 - val_acc: 0.9048
Epoch 165/800
114/114 - 0s - loss: 0.0030 - acc: 1.0000 - val_loss: 0.3668 - val_acc: 0.9048
Epoch 166/800
114/114 - 0s - loss: 0.0028 - acc: 1.0000 - val_loss: 0.3668 - val_acc: 0.9048
Epoch 167/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3579 - val_acc: 0.9048
Epoch 168/800
114/114 - 0s - loss: 0.0026 - acc: 1.0000 - val_loss: 0.3549 - val_acc: 0.9048
Epoch 169/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3519 - val_acc: 0.9524
Epoch 170/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3590 - val_acc: 0.9048
Epoch 171/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3668 - val_acc: 0.9048
Epoch 172/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3642 - val_acc: 0.9048
Epoch 173/800
114/114 - 0s - loss: 0.0025 - acc: 1.0000 - val_loss: 0.3566 - val_acc: 0.9048
Epoch 174/800
114/114 - 0s - loss: 0.0030 - acc: 1.0000 - val_loss: 0.3549 - val_acc: 0.9048
Epoch 175/800
114/114 - 0s - loss: 0.0026 - acc: 1.0000 - val_loss: 0.3710 - val_acc: 0.9048
Epoch 176/800
114/114 - 0s - loss: 0.0026 - acc: 1.0000 - val_loss: 0.3721 - val_acc: 0.9048
Epoch 177/800
114/114 - 0s - loss: 0.0026 - acc: 1.0000 - val_loss: 0.3658 - val_acc: 0.9048
Epoch 178/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3559 - val_acc: 0.9524
Epoch 179/800
114/114 - 0s - loss: 0.0026 - acc: 1.0000 - val_loss: 0.3644 - val_acc: 0.9048
Epoch 180/800
114/114 - 0s - loss: 0.0024 - acc: 1.0000 - val_loss: 0.3740 - val_acc: 0.9048
Epoch 181/800
114/114 - 0s - loss: 0.0025 - acc: 1.0000 - val_loss: 0.3715 - val_acc: 0.9048
Epoch 182/800
114/114 - 0s - loss: 0.0027 - acc: 1.0000 - val_loss: 0.3617 - val_acc: 0.9048
Epoch 183/800
114/114 - 0s - loss: 0.0028 - acc: 1.0000 - val_loss: 0.3604 - val_acc: 0.9048
Epoch 184/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3713 - val_acc: 0.9048
Epoch 185/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3800 - val_acc: 0.9048
Epoch 186/800
114/114 - 0s - loss: 0.0026 - acc: 1.0000 - val_loss: 0.3744 - val_acc: 0.9048
```

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Epoch 187/800
114/114 - 0s - loss: 0.0025 - acc: 1.0000 - val_loss: 0.3616 - val_acc: 0.9048
Epoch 188/800
114/114 - 0s - loss: 0.0024 - acc: 1.0000 - val_loss: 0.3645 - val_acc: 0.9048
Epoch 189/800
114/114 - 0s - loss: 0.0025 - acc: 1.0000 - val_loss: 0.3716 - val_acc: 0.9048
Epoch 190/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3705 - val_acc: 0.9048
Epoch 191/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3663 - val_acc: 0.9048
Epoch 192/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3705 - val_acc: 0.9048
Epoch 193/800
114/114 - 0s - loss: 0.0024 - acc: 1.0000 - val_loss: 0.3763 - val_acc: 0.9048
Epoch 194/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3675 - val_acc: 0.9048
Epoch 195/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3678 - val_acc: 0.9048
Epoch 196/800
114/114 - 0s - loss: 0.0024 - acc: 1.0000 - val_loss: 0.3676 - val_acc: 0.9048
Epoch 197/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3750 - val_acc: 0.9048
Epoch 198/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3721 - val_acc: 0.9048
Epoch 199/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3709 - val_acc: 0.9048
Epoch 200/800
114/114 - 0s - loss: 0.0026 - acc: 1.0000 - val_loss: 0.3687 - val_acc: 0.9048
Epoch 201/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3822 - val_acc: 0.9048
Epoch 202/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3807 - val_acc: 0.9048
Epoch 203/800
114/114 - 0s - loss: 0.0021 - acc: 1.0000 - val_loss: 0.3718 - val_acc: 0.9048
Epoch 204/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3672 - val_acc: 0.9048
Epoch 205/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3723 - val_acc: 0.9048
Epoch 206/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3920 - val_acc: 0.9048
Epoch 207/800
114/114 - 0s - loss: 0.0028 - acc: 1.0000 - val_loss: 0.3870 - val_acc: 0.9048
Epoch 208/800
114/114 - 0s - loss: 0.0021 - acc: 1.0000 - val_loss: 0.3682 - val_acc: 0.9048
Epoch 209/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3704 - val_acc: 0.9048
Epoch 210/800
114/114 - 0s - loss: 0.0021 - acc: 1.0000 - val_loss: 0.3744 - val_acc: 0.9048
```

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Epoch 211/800
114/114 - 0s - loss: 0.0023 - acc: 1.0000 - val_loss: 0.3859 - val_acc: 0.9048
Epoch 212/800
114/114 - 0s - loss: 0.0021 - acc: 1.0000 - val_loss: 0.3738 - val_acc: 0.9048
Epoch 213/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3728 - val_acc: 0.9048
Epoch 214/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3740 - val_acc: 0.9048
Epoch 215/800
114/114 - 0s - loss: 0.0021 - acc: 1.0000 - val_loss: 0.3841 - val_acc: 0.9048
Epoch 216/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3807 - val_acc: 0.9048
Epoch 217/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3803 - val_acc: 0.9048
Epoch 218/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.3790 - val_acc: 0.9048
Epoch 219/800
114/114 - 0s - loss: 0.0021 - acc: 1.0000 - val_loss: 0.3747 - val_acc: 0.9048
Epoch 220/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3833 - val_acc: 0.9048
Epoch 221/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.3822 - val_acc: 0.9048
Epoch 222/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.3788 - val_acc: 0.9048
Epoch 223/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3743 - val_acc: 0.9048
Epoch 224/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3818 - val_acc: 0.9048
Epoch 225/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3885 - val_acc: 0.9048
Epoch 226/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3819 - val_acc: 0.9048
Epoch 227/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.3792 - val_acc: 0.9048
Epoch 228/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.3842 - val_acc: 0.9048
Epoch 229/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.3842 - val_acc: 0.9048
Epoch 230/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.3840 - val_acc: 0.9048
Epoch 231/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3788 - val_acc: 0.9048
Epoch 232/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3808 - val_acc: 0.9048
Epoch 233/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.3956 - val_acc: 0.9048
Epoch 234/800
114/114 - 0s - loss: 0.0021 - acc: 1.0000 - val_loss: 0.3955 - val_acc: 0.9048
```

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Epoch 235/800
114/114 - 0s - loss: 0.0017 - acc: 1.0000 - val_loss: 0.3794 - val_acc: 0.9048
Epoch 236/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.3754 - val_acc: 0.9524
Epoch 237/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.3821 - val_acc: 0.9048
Epoch 238/800
114/114 - 0s - loss: 0.0017 - acc: 1.0000 - val_loss: 0.3984 - val_acc: 0.9048
Epoch 239/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.3953 - val_acc: 0.9048
Epoch 240/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.3875 - val_acc: 0.9048
Epoch 241/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.3815 - val_acc: 0.9048
Epoch 242/800
114/114 - 0s - loss: 0.0017 - acc: 1.0000 - val_loss: 0.3824 - val_acc: 0.9048
Epoch 243/800
114/114 - 0s - loss: 0.0017 - acc: 1.0000 - val_loss: 0.3887 - val_acc: 0.9048
Epoch 244/800
114/114 - 0s - loss: 0.0017 - acc: 1.0000 - val_loss: 0.3992 - val_acc: 0.9048
Epoch 245/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.3959 - val_acc: 0.9048
Epoch 246/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.3878 - val_acc: 0.9048
Epoch 247/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3810 - val_acc: 0.9048
Epoch 248/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.3938 - val_acc: 0.9048
Epoch 249/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.4078 - val_acc: 0.9048
Epoch 250/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.3946 - val_acc: 0.9048
Epoch 251/800
114/114 - 0s - loss: 0.0022 - acc: 1.0000 - val_loss: 0.3811 - val_acc: 0.9048
Epoch 252/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.4041 - val_acc: 0.9048
Epoch 253/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.4035 - val_acc: 0.9048
Epoch 254/800
114/114 - 0s - loss: 0.0020 - acc: 1.0000 - val_loss: 0.3866 - val_acc: 0.9048
Epoch 255/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.3897 - val_acc: 0.9048
Epoch 256/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.3984 - val_acc: 0.9048
Epoch 257/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.4045 - val_acc: 0.9048
Epoch 258/800
114/114 - 0s - loss: 0.0017 - acc: 1.0000 - val_loss: 0.3990 - val_acc: 0.9048
```

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Epoch 259/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.3881 - val_acc: 0.9048
Epoch 260/800
114/114 - 0s - loss: 0.0019 - acc: 1.0000 - val_loss: 0.3822 - val_acc: 0.9524
Epoch 261/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.4000 - val_acc: 0.9048
Epoch 262/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.4018 - val_acc: 0.9048
Epoch 263/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.3977 - val_acc: 0.9048
Epoch 264/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.3889 - val_acc: 0.9048
Epoch 265/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.3932 - val_acc: 0.9048
Epoch 266/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.3936 - val_acc: 0.9048
Epoch 267/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.3963 - val_acc: 0.9048
Epoch 268/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.4015 - val_acc: 0.9048
Epoch 269/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.3968 - val_acc: 0.9048
Epoch 270/800
114/114 - 0s - loss: 0.0017 - acc: 1.0000 - val_loss: 0.3923 - val_acc: 0.9048
Epoch 271/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.4048 - val_acc: 0.9048
Epoch 272/800
114/114 - 0s - loss: 0.0018 - acc: 1.0000 - val_loss: 0.4153 - val_acc: 0.9048
Epoch 273/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.4000 - val_acc: 0.9048
Epoch 274/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.3929 - val_acc: 0.9048
Epoch 275/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.3872 - val_acc: 0.9048
Epoch 276/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.3948 - val_acc: 0.9048
Epoch 277/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.4065 - val_acc: 0.9048
Epoch 278/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.4126 - val_acc: 0.9048
Epoch 279/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.4026 - val_acc: 0.9048
Epoch 280/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.3897 - val_acc: 0.9048
Epoch 281/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.3959 - val_acc: 0.9048
Epoch 282/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.4092 - val_acc: 0.9048
```

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Epoch 283/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.4059 - val_acc: 0.9048
Epoch 284/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.3963 - val_acc: 0.9048
Epoch 285/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.3913 - val_acc: 0.9048
Epoch 286/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.4004 - val_acc: 0.9048
Epoch 287/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.4194 - val_acc: 0.9048
Epoch 288/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.4162 - val_acc: 0.9048
Epoch 289/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.3899 - val_acc: 0.9524
Epoch 290/800
114/114 - 0s - loss: 0.0016 - acc: 1.0000 - val_loss: 0.3986 - val_acc: 0.9048
Epoch 291/800
114/114 - 0s - loss: 0.0015 - acc: 1.0000 - val_loss: 0.4102 - val_acc: 0.9048
Epoch 292/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.4029 - val_acc: 0.9048
Epoch 293/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4057 - val_acc: 0.9048
Epoch 294/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.4046 - val_acc: 0.9048
Epoch 295/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.4056 - val_acc: 0.9048
Epoch 296/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4086 - val_acc: 0.9048
Epoch 297/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.4102 - val_acc: 0.9048
Epoch 298/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4023 - val_acc: 0.9048
Epoch 299/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.3993 - val_acc: 0.9048
Epoch 300/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4080 - val_acc: 0.9048
Epoch 301/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.4140 - val_acc: 0.9048
Epoch 302/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4047 - val_acc: 0.9048
Epoch 303/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.3978 - val_acc: 0.9048
Epoch 304/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.4078 - val_acc: 0.9048
Epoch 305/800
114/114 - 0s - loss: 0.0017 - acc: 1.0000 - val_loss: 0.4240 - val_acc: 0.9048
Epoch 306/800
114/114 - 0s - loss: 0.0014 - acc: 1.0000 - val_loss: 0.4002 - val_acc: 0.9048
```

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Epoch 307/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.3964 - val_acc: 0.9048
Epoch 308/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4073 - val_acc: 0.9048
Epoch 309/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4211 - val_acc: 0.9048
Epoch 310/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4142 - val_acc: 0.9048
Epoch 311/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4060 - val_acc: 0.9048
Epoch 312/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4069 - val_acc: 0.9048
Epoch 313/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4037 - val_acc: 0.9048
Epoch 314/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4117 - val_acc: 0.9048
Epoch 315/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4181 - val_acc: 0.9048
Epoch 316/800
114/114 - 0s - loss: 0.0013 - acc: 1.0000 - val_loss: 0.4161 - val_acc: 0.9048
Epoch 317/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4021 - val_acc: 0.9048
Epoch 318/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4017 - val_acc: 0.9048
Epoch 319/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4103 - val_acc: 0.9048
Epoch 320/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4162 - val_acc: 0.9048
Epoch 321/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4150 - val_acc: 0.9048
Epoch 322/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4170 - val_acc: 0.9048
Epoch 323/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4085 - val_acc: 0.9048
Epoch 324/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4049 - val_acc: 0.9048
Epoch 325/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4093 - val_acc: 0.9048
Epoch 326/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4298 - val_acc: 0.9048
Epoch 327/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4234 - val_acc: 0.9048
Epoch 328/800
114/114 - 0s - loss: 0.0010 - acc: 1.0000 - val_loss: 0.4113 - val_acc: 0.9048
Epoch 329/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4064 - val_acc: 0.9048
Epoch 330/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4123 - val_acc: 0.9048
```

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Epoch 331/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4195 - val_acc: 0.9048
Epoch 332/800
114/114 - 0s - loss: 0.0010 - acc: 1.0000 - val_loss: 0.4197 - val_acc: 0.9048
Epoch 333/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4101 - val_acc: 0.9048
Epoch 334/800
114/114 - 0s - loss: 0.0010 - acc: 1.0000 - val_loss: 0.4133 - val_acc: 0.9048
Epoch 335/800
114/114 - 0s - loss: 0.0010 - acc: 1.0000 - val_loss: 0.4157 - val_acc: 0.9048
Epoch 336/800
114/114 - 0s - loss: 0.0010 - acc: 1.0000 - val_loss: 0.4169 - val_acc: 0.9048
Epoch 337/800
114/114 - 0s - loss: 9.8105e-04 - acc: 1.0000 - val_loss: 0.4128 - val_acc: 0.9048
Epoch 338/800
114/114 - 0s - loss: 0.0010 - acc: 1.0000 - val_loss: 0.4130 - val_acc: 0.9048
Epoch 339/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4104 - val_acc: 0.9048
Epoch 340/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4302 - val_acc: 0.9048
Epoch 341/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4282 - val_acc: 0.9048
Epoch 342/800
114/114 - 0s - loss: 9.9992e-04 - acc: 1.0000 - val_loss: 0.4153 - val_acc: 0.9048
Epoch 343/800
114/114 - 0s - loss: 9.5551e-04 - acc: 1.0000 - val_loss: 0.4130 - val_acc: 0.9048
Epoch 344/800
114/114 - 0s - loss: 9.7606e-04 - acc: 1.0000 - val_loss: 0.4136 - val_acc: 0.9048
Epoch 345/800
114/114 - 0s - loss: 9.6248e-04 - acc: 1.0000 - val_loss: 0.4189 - val_acc: 0.9048
Epoch 346/800
114/114 - 0s - loss: 9.4742e-04 - acc: 1.0000 - val_loss: 0.4232 - val_acc: 0.9048
Epoch 347/800
114/114 - 0s - loss: 9.5871e-04 - acc: 1.0000 - val_loss: 0.4218 - val_acc: 0.9048
Epoch 348/800
114/114 - 0s - loss: 9.4243e-04 - acc: 1.0000 - val_loss: 0.4198 - val_acc: 0.9048
Epoch 349/800
114/114 - 0s - loss: 9.5907e-04 - acc: 1.0000 - val_loss: 0.4160 - val_acc: 0.9048
Epoch 350/800
114/114 - 0s - loss: 9.4871e-04 - acc: 1.0000 - val_loss: 0.4181 - val_acc: 0.9048
Epoch 351/800
114/114 - 0s - loss: 9.1787e-04 - acc: 1.0000 - val_loss: 0.4236 - val_acc: 0.9048
Epoch 352/800
114/114 - 0s - loss: 9.3028e-04 - acc: 1.0000 - val_loss: 0.4252 - val_acc: 0.9048
Epoch 353/800
114/114 - 0s - loss: 9.3866e-04 - acc: 1.0000 - val_loss: 0.4225 - val_acc: 0.9048
Epoch 354/800
114/114 - 0s - loss: 9.0349e-04 - acc: 1.0000 - val_loss: 0.4168 - val_acc: 0.9048
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Epoch 355/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4138 - val_acc: 0.9048
Epoch 356/800
114/114 - 0s - loss: 8.8672e-04 - acc: 1.0000 - val_loss: 0.4255 - val_acc: 0.9048
Epoch 357/800
114/114 - 0s - loss: 9.8126e-04 - acc: 1.0000 - val_loss: 0.4298 - val_acc: 0.9048
Epoch 358/800
114/114 - 0s - loss: 9.1720e-04 - acc: 1.0000 - val_loss: 0.4245 - val_acc: 0.9048
Epoch 359/800
114/114 - 0s - loss: 8.8737e-04 - acc: 1.0000 - val_loss: 0.4200 - val_acc: 0.9048
Epoch 360/800
114/114 - 0s - loss: 0.0012 - acc: 1.0000 - val_loss: 0.4125 - val_acc: 0.9048
Epoch 361/800
114/114 - 0s - loss: 9.2196e-04 - acc: 1.0000 - val_loss: 0.4282 - val_acc: 0.9048
Epoch 362/800
114/114 - 0s - loss: 9.6863e-04 - acc: 1.0000 - val_loss: 0.4343 - val_acc: 0.9048
Epoch 363/800
114/114 - 0s - loss: 9.3790e-04 - acc: 1.0000 - val_loss: 0.4210 - val_acc: 0.9048
Epoch 364/800
114/114 - 0s - loss: 8.6812e-04 - acc: 1.0000 - val_loss: 0.4169 - val_acc: 0.9048
Epoch 365/800
114/114 - 0s - loss: 9.5140e-04 - acc: 1.0000 - val_loss: 0.4252 - val_acc: 0.9048
Epoch 366/800
114/114 - 0s - loss: 8.5043e-04 - acc: 1.0000 - val_loss: 0.4249 - val_acc: 0.9048
Epoch 367/800
114/114 - 0s - loss: 8.5152e-04 - acc: 1.0000 - val_loss: 0.4239 - val_acc: 0.9048
Epoch 368/800
114/114 - 0s - loss: 8.8732e-04 - acc: 1.0000 - val_loss: 0.4271 - val_acc: 0.9048
Epoch 369/800
114/114 - 0s - loss: 8.6961e-04 - acc: 1.0000 - val_loss: 0.4224 - val_acc: 0.9048
Epoch 370/800
114/114 - 0s - loss: 8.7895e-04 - acc: 1.0000 - val_loss: 0.4222 - val_acc: 0.9048
Epoch 371/800
114/114 - 0s - loss: 8.3939e-04 - acc: 1.0000 - val_loss: 0.4187 - val_acc: 0.9048
Epoch 372/800
114/114 - 0s - loss: 9.1025e-04 - acc: 1.0000 - val_loss: 0.4192 - val_acc: 0.9048
Epoch 373/800
114/114 - 0s - loss: 8.9049e-04 - acc: 1.0000 - val_loss: 0.4333 - val_acc: 0.9048
Epoch 374/800
114/114 - 0s - loss: 8.5724e-04 - acc: 1.0000 - val_loss: 0.4312 - val_acc: 0.9048
Epoch 375/800
114/114 - 0s - loss: 8.8399e-04 - acc: 1.0000 - val_loss: 0.4245 - val_acc: 0.9048
Epoch 376/800
114/114 - 0s - loss: 8.5170e-04 - acc: 1.0000 - val_loss: 0.4306 - val_acc: 0.9048
Epoch 377/800
114/114 - 0s - loss: 8.7374e-04 - acc: 1.0000 - val_loss: 0.4263 - val_acc: 0.9048
Epoch 378/800
114/114 - 0s - loss: 8.1135e-04 - acc: 1.0000 - val_loss: 0.4303 - val_acc: 0.9048
```

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Epoch 379/800
114/114 - 0s - loss: 8.2303e-04 - acc: 1.0000 - val_loss: 0.4279 - val_acc: 0.9048
Epoch 380/800
114/114 - 0s - loss: 8.2490e-04 - acc: 1.0000 - val_loss: 0.4305 - val_acc: 0.9048
Epoch 381/800
114/114 - 0s - loss: 8.1100e-04 - acc: 1.0000 - val_loss: 0.4281 - val_acc: 0.9048
Epoch 382/800
114/114 - 0s - loss: 7.7675e-04 - acc: 1.0000 - val_loss: 0.4233 - val_acc: 0.9048
Epoch 383/800
114/114 - 0s - loss: 8.2992e-04 - acc: 1.0000 - val_loss: 0.4199 - val_acc: 0.9048
Epoch 384/800
114/114 - 0s - loss: 8.7855e-04 - acc: 1.0000 - val_loss: 0.4269 - val_acc: 0.9048
Epoch 385/800
114/114 - 0s - loss: 0.0011 - acc: 1.0000 - val_loss: 0.4394 - val_acc: 0.9048
Epoch 386/800
114/114 - 0s - loss: 9.1501e-04 - acc: 1.0000 - val_loss: 0.4188 - val_acc: 0.9048
Epoch 387/800
114/114 - 0s - loss: 8.9783e-04 - acc: 1.0000 - val_loss: 0.4203 - val_acc: 0.9048
Epoch 388/800
114/114 - 0s - loss: 8.0507e-04 - acc: 1.0000 - val_loss: 0.4303 - val_acc: 0.9048
Epoch 389/800
114/114 - 0s - loss: 7.6408e-04 - acc: 1.0000 - val_loss: 0.4346 - val_acc: 0.9048
Epoch 390/800
114/114 - 0s - loss: 9.5726e-04 - acc: 1.0000 - val_loss: 0.4368 - val_acc: 0.9048
Epoch 391/800
114/114 - 0s - loss: 9.0402e-04 - acc: 1.0000 - val_loss: 0.4168 - val_acc: 0.9048
Epoch 392/800
114/114 - 0s - loss: 9.8696e-04 - acc: 1.0000 - val_loss: 0.4205 - val_acc: 0.9048
Epoch 393/800
114/114 - 0s - loss: 9.1546e-04 - acc: 1.0000 - val_loss: 0.4373 - val_acc: 0.9048
Epoch 394/800
114/114 - 0s - loss: 7.8619e-04 - acc: 1.0000 - val_loss: 0.4349 - val_acc: 0.9048
Epoch 395/800
114/114 - 0s - loss: 9.0424e-04 - acc: 1.0000 - val_loss: 0.4213 - val_acc: 0.9048
Epoch 396/800
114/114 - 0s - loss: 7.7984e-04 - acc: 1.0000 - val_loss: 0.4242 - val_acc: 0.9048
Epoch 397/800
114/114 - 0s - loss: 7.6326e-04 - acc: 1.0000 - val_loss: 0.4346 - val_acc: 0.9048
Epoch 398/800
114/114 - 0s - loss: 8.5353e-04 - acc: 1.0000 - val_loss: 0.4407 - val_acc: 0.9048
Epoch 399/800
114/114 - 0s - loss: 8.5869e-04 - acc: 1.0000 - val_loss: 0.4252 - val_acc: 0.9048
Epoch 400/800
114/114 - 0s - loss: 7.4000e-04 - acc: 1.0000 - val_loss: 0.4267 - val_acc: 0.9048
Epoch 401/800
114/114 - 0s - loss: 7.2839e-04 - acc: 1.0000 - val_loss: 0.4299 - val_acc: 0.9048
Epoch 402/800
114/114 - 0s - loss: 7.5113e-04 - acc: 1.0000 - val_loss: 0.4375 - val_acc: 0.9048
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Epoch 403/800
114/114 - 0s - loss: 7.2561e-04 - acc: 1.0000 - val_loss: 0.4349 - val_acc: 0.9048
Epoch 404/800
114/114 - 0s - loss: 7.7396e-04 - acc: 1.0000 - val_loss: 0.4356 - val_acc: 0.9048
Epoch 405/800
114/114 - 0s - loss: 6.8452e-04 - acc: 1.0000 - val_loss: 0.4271 - val_acc: 0.9048
Epoch 406/800
114/114 - 0s - loss: 7.4422e-04 - acc: 1.0000 - val_loss: 0.4274 - val_acc: 0.9048
Epoch 407/800
114/114 - 0s - loss: 7.2237e-04 - acc: 1.0000 - val_loss: 0.4291 - val_acc: 0.9048
Epoch 408/800
114/114 - 0s - loss: 7.0686e-04 - acc: 1.0000 - val_loss: 0.4343 - val_acc: 0.9048
Epoch 409/800
114/114 - 0s - loss: 7.2352e-04 - acc: 1.0000 - val_loss: 0.4372 - val_acc: 0.9048
Epoch 410/800
114/114 - 0s - loss: 7.2251e-04 - acc: 1.0000 - val_loss: 0.4345 - val_acc: 0.9048
Epoch 411/800
114/114 - 0s - loss: 7.7685e-04 - acc: 1.0000 - val_loss: 0.4406 - val_acc: 0.9048
Epoch 412/800
114/114 - 0s - loss: 6.9813e-04 - acc: 1.0000 - val_loss: 0.4370 - val_acc: 0.9048
Epoch 413/800
114/114 - 0s - loss: 6.8546e-04 - acc: 1.0000 - val_loss: 0.4283 - val_acc: 0.9048
Epoch 414/800
114/114 - 0s - loss: 7.5164e-04 - acc: 1.0000 - val_loss: 0.4260 - val_acc: 0.9048
Epoch 415/800
114/114 - 0s - loss: 7.6512e-04 - acc: 1.0000 - val_loss: 0.4410 - val_acc: 0.9048
Epoch 416/800
114/114 - 0s - loss: 6.8331e-04 - acc: 1.0000 - val_loss: 0.4430 - val_acc: 0.9048
Epoch 417/800
114/114 - 0s - loss: 6.9315e-04 - acc: 1.0000 - val_loss: 0.4396 - val_acc: 0.9048
Epoch 418/800
114/114 - 0s - loss: 6.8064e-04 - acc: 1.0000 - val_loss: 0.4324 - val_acc: 0.9048
Epoch 419/800
114/114 - 0s - loss: 7.2392e-04 - acc: 1.0000 - val_loss: 0.4346 - val_acc: 0.9048
Epoch 420/800
114/114 - 0s - loss: 6.6183e-04 - acc: 1.0000 - val_loss: 0.4412 - val_acc: 0.9048
Epoch 421/800
114/114 - 0s - loss: 6.9299e-04 - acc: 1.0000 - val_loss: 0.4428 - val_acc: 0.9048
Epoch 422/800
114/114 - 0s - loss: 6.8767e-04 - acc: 1.0000 - val_loss: 0.4361 - val_acc: 0.9048
Epoch 423/800
114/114 - 0s - loss: 7.1844e-04 - acc: 1.0000 - val_loss: 0.4332 - val_acc: 0.9048
Epoch 424/800
114/114 - 0s - loss: 7.7151e-04 - acc: 1.0000 - val_loss: 0.4433 - val_acc: 0.9048
Epoch 425/800
114/114 - 0s - loss: 6.4428e-04 - acc: 1.0000 - val_loss: 0.4376 - val_acc: 0.9048
Epoch 426/800
114/114 - 0s - loss: 6.7214e-04 - acc: 1.0000 - val_loss: 0.4351 - val_acc: 0.9048
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Epoch 427/800
114/114 - 0s - loss: 6.7268e-04 - acc: 1.0000 - val_loss: 0.4355 - val_acc: 0.9048
Epoch 428/800
114/114 - 0s - loss: 7.8452e-04 - acc: 1.0000 - val_loss: 0.4461 - val_acc: 0.9048
Epoch 429/800
114/114 - 0s - loss: 6.3450e-04 - acc: 1.0000 - val_loss: 0.4380 - val_acc: 0.9048
Epoch 430/800
114/114 - 0s - loss: 6.7582e-04 - acc: 1.0000 - val_loss: 0.4309 - val_acc: 0.9048
Epoch 431/800
114/114 - 0s - loss: 8.3147e-04 - acc: 1.0000 - val_loss: 0.4290 - val_acc: 0.9048
Epoch 432/800
114/114 - 0s - loss: 5.8168e-04 - acc: 1.0000 - val_loss: 0.4476 - val_acc: 0.9048
Epoch 433/800
114/114 - 0s - loss: 8.5652e-04 - acc: 1.0000 - val_loss: 0.4638 - val_acc: 0.9048
Epoch 434/800
114/114 - 0s - loss: 7.6693e-04 - acc: 1.0000 - val_loss: 0.4462 - val_acc: 0.9048
Epoch 435/800
114/114 - 0s - loss: 5.8265e-04 - acc: 1.0000 - val_loss: 0.4285 - val_acc: 0.9048
Epoch 436/800
114/114 - 0s - loss: 6.8570e-04 - acc: 1.0000 - val_loss: 0.4286 - val_acc: 0.9048
Epoch 437/800
114/114 - 0s - loss: 7.2217e-04 - acc: 1.0000 - val_loss: 0.4397 - val_acc: 0.9048
Epoch 438/800
114/114 - 0s - loss: 6.0531e-04 - acc: 1.0000 - val_loss: 0.4436 - val_acc: 0.9048
Epoch 439/800
114/114 - 0s - loss: 6.1821e-04 - acc: 1.0000 - val_loss: 0.4407 - val_acc: 0.9048
Epoch 440/800
114/114 - 0s - loss: 6.0038e-04 - acc: 1.0000 - val_loss: 0.4403 - val_acc: 0.9048
Epoch 441/800
114/114 - 0s - loss: 6.0817e-04 - acc: 1.0000 - val_loss: 0.4395 - val_acc: 0.9048
Epoch 442/800
114/114 - 0s - loss: 5.9842e-04 - acc: 1.0000 - val_loss: 0.4435 - val_acc: 0.9048
Epoch 443/800
114/114 - 0s - loss: 6.0506e-04 - acc: 1.0000 - val_loss: 0.4450 - val_acc: 0.9048
Epoch 444/800
114/114 - 0s - loss: 5.9322e-04 - acc: 1.0000 - val_loss: 0.4404 - val_acc: 0.9048
Epoch 445/800
114/114 - 0s - loss: 5.8834e-04 - acc: 1.0000 - val_loss: 0.4388 - val_acc: 0.9048
Epoch 446/800
114/114 - 0s - loss: 5.9837e-04 - acc: 1.0000 - val_loss: 0.4372 - val_acc: 0.9048
Epoch 447/800
114/114 - 0s - loss: 6.2916e-04 - acc: 1.0000 - val_loss: 0.4396 - val_acc: 0.9048
Epoch 448/800
114/114 - 0s - loss: 5.6426e-04 - acc: 1.0000 - val_loss: 0.4485 - val_acc: 0.9048
Epoch 449/800
114/114 - 0s - loss: 7.2310e-04 - acc: 1.0000 - val_loss: 0.4592 - val_acc: 0.9048
Epoch 450/800
114/114 - 0s - loss: 6.3395e-04 - acc: 1.0000 - val_loss: 0.4475 - val_acc: 0.9048
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Epoch 451/800
114/114 - 0s - loss: 5.8385e-04 - acc: 1.0000 - val_loss: 0.4370 - val_acc: 0.9048
Epoch 452/800
114/114 - 0s - loss: 6.4171e-04 - acc: 1.0000 - val_loss: 0.4345 - val_acc: 0.9048
Epoch 453/800
114/114 - 0s - loss: 5.7979e-04 - acc: 1.0000 - val_loss: 0.4456 - val_acc: 0.9048
Epoch 454/800
114/114 - 0s - loss: 7.7807e-04 - acc: 1.0000 - val_loss: 0.4600 - val_acc: 0.9048
Epoch 455/800
114/114 - 0s - loss: 6.0416e-04 - acc: 1.0000 - val_loss: 0.4446 - val_acc: 0.9048
Epoch 456/800
114/114 - 0s - loss: 5.9497e-04 - acc: 1.0000 - val_loss: 0.4348 - val_acc: 0.9048
Epoch 457/800
114/114 - 0s - loss: 6.2134e-04 - acc: 1.0000 - val_loss: 0.4368 - val_acc: 0.9048
Epoch 458/800
114/114 - 0s - loss: 5.7028e-04 - acc: 1.0000 - val_loss: 0.4465 - val_acc: 0.9048
Epoch 459/800
114/114 - 0s - loss: 5.5959e-04 - acc: 1.0000 - val_loss: 0.4503 - val_acc: 0.9048
Epoch 460/800
114/114 - 0s - loss: 5.6293e-04 - acc: 1.0000 - val_loss: 0.4540 - val_acc: 0.9048
Epoch 461/800
114/114 - 0s - loss: 5.8773e-04 - acc: 1.0000 - val_loss: 0.4466 - val_acc: 0.9048
Epoch 462/800
114/114 - 0s - loss: 5.6009e-04 - acc: 1.0000 - val_loss: 0.4442 - val_acc: 0.9048
Epoch 463/800
114/114 - 0s - loss: 5.6070e-04 - acc: 1.0000 - val_loss: 0.4428 - val_acc: 0.9048
Epoch 464/800
114/114 - 0s - loss: 5.3877e-04 - acc: 1.0000 - val_loss: 0.4479 - val_acc: 0.9048
Epoch 465/800
114/114 - 0s - loss: 5.6990e-04 - acc: 1.0000 - val_loss: 0.4527 - val_acc: 0.9048
Epoch 466/800
114/114 - 0s - loss: 5.5455e-04 - acc: 1.0000 - val_loss: 0.4478 - val_acc: 0.9048
Epoch 467/800
114/114 - 0s - loss: 5.3736e-04 - acc: 1.0000 - val_loss: 0.4470 - val_acc: 0.9048
Epoch 468/800
114/114 - 0s - loss: 5.6825e-04 - acc: 1.0000 - val_loss: 0.4480 - val_acc: 0.9048
Epoch 469/800
114/114 - 0s - loss: 5.6893e-04 - acc: 1.0000 - val_loss: 0.4395 - val_acc: 0.9048
Epoch 470/800
114/114 - 0s - loss: 6.1534e-04 - acc: 1.0000 - val_loss: 0.4497 - val_acc: 0.9048
Epoch 471/800
114/114 - 0s - loss: 5.3696e-04 - acc: 1.0000 - val_loss: 0.4475 - val_acc: 0.9048
Epoch 472/800
114/114 - 0s - loss: 5.2962e-04 - acc: 1.0000 - val_loss: 0.4485 - val_acc: 0.9048
Epoch 473/800
114/114 - 0s - loss: 6.1353e-04 - acc: 1.0000 - val_loss: 0.4569 - val_acc: 0.9048
Epoch 474/800
114/114 - 0s - loss: 5.4720e-04 - acc: 1.0000 - val_loss: 0.4472 - val_acc: 0.9048
```

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Epoch 475/800
114/114 - 0s - loss: 5.3120e-04 - acc: 1.0000 - val_loss: 0.4460 - val_acc: 0.9048
Epoch 476/800
114/114 - 0s - loss: 5.3753e-04 - acc: 1.0000 - val_loss: 0.4451 - val_acc: 0.9048
Epoch 477/800
114/114 - 0s - loss: 5.1278e-04 - acc: 1.0000 - val_loss: 0.4519 - val_acc: 0.9048
Epoch 478/800
114/114 - 0s - loss: 5.4889e-04 - acc: 1.0000 - val_loss: 0.4584 - val_acc: 0.9048
Epoch 479/800
114/114 - 0s - loss: 5.2385e-04 - acc: 1.0000 - val_loss: 0.4543 - val_acc: 0.9048
Epoch 480/800
114/114 - 0s - loss: 5.3349e-04 - acc: 1.0000 - val_loss: 0.4460 - val_acc: 0.9048
Epoch 481/800
114/114 - 0s - loss: 5.0675e-04 - acc: 1.0000 - val_loss: 0.4474 - val_acc: 0.9048
Epoch 482/800
114/114 - 0s - loss: 5.4513e-04 - acc: 1.0000 - val_loss: 0.4553 - val_acc: 0.9048
Epoch 483/800
114/114 - 0s - loss: 5.1643e-04 - acc: 1.0000 - val_loss: 0.4552 - val_acc: 0.9048
Epoch 484/800
114/114 - 0s - loss: 4.9537e-04 - acc: 1.0000 - val_loss: 0.4476 - val_acc: 0.9048
Epoch 485/800
114/114 - 0s - loss: 5.1260e-04 - acc: 1.0000 - val_loss: 0.4444 - val_acc: 0.9048
Epoch 486/800
114/114 - 0s - loss: 5.2462e-04 - acc: 1.0000 - val_loss: 0.4471 - val_acc: 0.9048
Epoch 487/800
114/114 - 0s - loss: 5.1133e-04 - acc: 1.0000 - val_loss: 0.4593 - val_acc: 0.9048
Epoch 488/800
114/114 - 0s - loss: 5.1119e-04 - acc: 1.0000 - val_loss: 0.4576 - val_acc: 0.9048
Epoch 489/800
114/114 - 0s - loss: 4.9731e-04 - acc: 1.0000 - val_loss: 0.4524 - val_acc: 0.9048
Epoch 490/800
114/114 - 0s - loss: 4.8509e-04 - acc: 1.0000 - val_loss: 0.4486 - val_acc: 0.9048
Epoch 491/800
114/114 - 0s - loss: 4.8892e-04 - acc: 1.0000 - val_loss: 0.4437 - val_acc: 0.9048
Epoch 492/800
114/114 - 0s - loss: 5.0928e-04 - acc: 1.0000 - val_loss: 0.4475 - val_acc: 0.9048
Epoch 493/800
114/114 - 0s - loss: 5.0096e-04 - acc: 1.0000 - val_loss: 0.4510 - val_acc: 0.9048
Epoch 494/800
114/114 - 0s - loss: 5.2940e-04 - acc: 1.0000 - val_loss: 0.4674 - val_acc: 0.9048
Epoch 495/800
114/114 - 0s - loss: 5.6564e-04 - acc: 1.0000 - val_loss: 0.4577 - val_acc: 0.9048
Epoch 496/800
114/114 - 0s - loss: 4.7328e-04 - acc: 1.0000 - val_loss: 0.4522 - val_acc: 0.9048
Epoch 497/800
114/114 - 0s - loss: 4.6640e-04 - acc: 1.0000 - val_loss: 0.4489 - val_acc: 0.9048
Epoch 498/800
114/114 - 0s - loss: 4.8799e-04 - acc: 1.0000 - val_loss: 0.4486 - val_acc: 0.9048
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Epoch 499/800
114/114 - 0s - loss: 4.7859e-04 - acc: 1.0000 - val_loss: 0.4518 - val_acc: 0.9048
Epoch 500/800
114/114 - 0s - loss: 4.9825e-04 - acc: 1.0000 - val_loss: 0.4500 - val_acc: 0.9048
Epoch 501/800
114/114 - 0s - loss: 4.8034e-04 - acc: 1.0000 - val_loss: 0.4587 - val_acc: 0.9048
Epoch 502/800
114/114 - 0s - loss: 4.6891e-04 - acc: 1.0000 - val_loss: 0.4592 - val_acc: 0.9048
Epoch 503/800
114/114 - 0s - loss: 4.7940e-04 - acc: 1.0000 - val_loss: 0.4513 - val_acc: 0.9048
Epoch 504/800
114/114 - 0s - loss: 4.5740e-04 - acc: 1.0000 - val_loss: 0.4502 - val_acc: 0.9048
Epoch 505/800
114/114 - 0s - loss: 4.8642e-04 - acc: 1.0000 - val_loss: 0.4493 - val_acc: 0.9048
Epoch 506/800
114/114 - 0s - loss: 5.2123e-04 - acc: 1.0000 - val_loss: 0.4619 - val_acc: 0.9048
Epoch 507/800
114/114 - 0s - loss: 4.6206e-04 - acc: 1.0000 - val_loss: 0.4572 - val_acc: 0.9048
Epoch 508/800
114/114 - 0s - loss: 4.4704e-04 - acc: 1.0000 - val_loss: 0.4546 - val_acc: 0.9048
Epoch 509/800
114/114 - 0s - loss: 4.5855e-04 - acc: 1.0000 - val_loss: 0.4523 - val_acc: 0.9048
Epoch 510/800
114/114 - 0s - loss: 4.7173e-04 - acc: 1.0000 - val_loss: 0.4560 - val_acc: 0.9048
Epoch 511/800
114/114 - 0s - loss: 4.8596e-04 - acc: 1.0000 - val_loss: 0.4617 - val_acc: 0.9048
Epoch 512/800
114/114 - 0s - loss: 4.4534e-04 - acc: 1.0000 - val_loss: 0.4540 - val_acc: 0.9048
Epoch 513/800
114/114 - 0s - loss: 4.5907e-04 - acc: 1.0000 - val_loss: 0.4499 - val_acc: 0.9048
Epoch 514/800
114/114 - 0s - loss: 4.4698e-04 - acc: 1.0000 - val_loss: 0.4546 - val_acc: 0.9048
Epoch 515/800
114/114 - 0s - loss: 4.3476e-04 - acc: 1.0000 - val_loss: 0.4608 - val_acc: 0.9048
Epoch 516/800
114/114 - 0s - loss: 4.7406e-04 - acc: 1.0000 - val_loss: 0.4584 - val_acc: 0.9048
Epoch 517/800
114/114 - 0s - loss: 4.4082e-04 - acc: 1.0000 - val_loss: 0.4625 - val_acc: 0.9048
Epoch 518/800
114/114 - 0s - loss: 4.4244e-04 - acc: 1.0000 - val_loss: 0.4612 - val_acc: 0.9048
Epoch 519/800
114/114 - 0s - loss: 4.3949e-04 - acc: 1.0000 - val_loss: 0.4572 - val_acc: 0.9048
Epoch 520/800
114/114 - 0s - loss: 4.4381e-04 - acc: 1.0000 - val_loss: 0.4590 - val_acc: 0.9048
Epoch 521/800
114/114 - 0s - loss: 4.4499e-04 - acc: 1.0000 - val_loss: 0.4581 - val_acc: 0.9048
Epoch 522/800
114/114 - 0s - loss: 4.2543e-04 - acc: 1.0000 - val_loss: 0.4525 - val_acc: 0.9048
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Epoch 523/800
114/114 - 0s - loss: 4.5729e-04 - acc: 1.0000 - val_loss: 0.4528 - val_acc: 0.9048
Epoch 524/800
114/114 - 0s - loss: 4.3354e-04 - acc: 1.0000 - val_loss: 0.4563 - val_acc: 0.9048
Epoch 525/800
114/114 - 0s - loss: 4.0757e-04 - acc: 1.0000 - val_loss: 0.4644 - val_acc: 0.9048
Epoch 526/800
114/114 - 0s - loss: 5.0837e-04 - acc: 1.0000 - val_loss: 0.4713 - val_acc: 0.9048
Epoch 527/800
114/114 - 0s - loss: 4.5438e-04 - acc: 1.0000 - val_loss: 0.4590 - val_acc: 0.9048
Epoch 528/800
114/114 - 0s - loss: 5.0752e-04 - acc: 1.0000 - val_loss: 0.4494 - val_acc: 0.9048
Epoch 529/800
114/114 - 0s - loss: 4.7652e-04 - acc: 1.0000 - val_loss: 0.4650 - val_acc: 0.9048
Epoch 530/800
114/114 - 0s - loss: 4.5196e-04 - acc: 1.0000 - val_loss: 0.4684 - val_acc: 0.9048
Epoch 531/800
114/114 - 0s - loss: 4.3524e-04 - acc: 1.0000 - val_loss: 0.4576 - val_acc: 0.9048
Epoch 532/800
114/114 - 0s - loss: 4.1503e-04 - acc: 1.0000 - val_loss: 0.4539 - val_acc: 0.9048
Epoch 533/800
114/114 - 0s - loss: 4.1266e-04 - acc: 1.0000 - val_loss: 0.4571 - val_acc: 0.9048
Epoch 534/800
114/114 - 0s - loss: 4.0415e-04 - acc: 1.0000 - val_loss: 0.4629 - val_acc: 0.9048
Epoch 535/800
114/114 - 0s - loss: 4.1006e-04 - acc: 1.0000 - val_loss: 0.4637 - val_acc: 0.9048
Epoch 536/800
114/114 - 0s - loss: 4.0216e-04 - acc: 1.0000 - val_loss: 0.4641 - val_acc: 0.9048
Epoch 537/800
114/114 - 0s - loss: 4.3952e-04 - acc: 1.0000 - val_loss: 0.4596 - val_acc: 0.9048
Epoch 538/800
114/114 - 0s - loss: 4.1674e-04 - acc: 1.0000 - val_loss: 0.4671 - val_acc: 0.9048
Epoch 539/800
114/114 - 0s - loss: 4.0730e-04 - acc: 1.0000 - val_loss: 0.4638 - val_acc: 0.9048
Epoch 540/800
114/114 - 0s - loss: 3.9392e-04 - acc: 1.0000 - val_loss: 0.4611 - val_acc: 0.9048
Epoch 541/800
114/114 - 0s - loss: 4.0472e-04 - acc: 1.0000 - val_loss: 0.4589 - val_acc: 0.9048
Epoch 542/800
114/114 - 0s - loss: 4.0993e-04 - acc: 1.0000 - val_loss: 0.4643 - val_acc: 0.9048
Epoch 543/800
114/114 - 0s - loss: 3.9683e-04 - acc: 1.0000 - val_loss: 0.4616 - val_acc: 0.9048
Epoch 544/800
114/114 - 0s - loss: 3.9757e-04 - acc: 1.0000 - val_loss: 0.4601 - val_acc: 0.9048
Epoch 545/800
114/114 - 0s - loss: 3.8781e-04 - acc: 1.0000 - val_loss: 0.4627 - val_acc: 0.9048
Epoch 546/800
114/114 - 0s - loss: 3.8260e-04 - acc: 1.0000 - val_loss: 0.4683 - val_acc: 0.9048
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Epoch 547/800
114/114 - 0s - loss: 4.0003e-04 - acc: 1.0000 - val_loss: 0.4684 - val_acc: 0.9048
Epoch 548/800
114/114 - 0s - loss: 3.9729e-04 - acc: 1.0000 - val_loss: 0.4614 - val_acc: 0.9048
Epoch 549/800
114/114 - 0s - loss: 3.8497e-04 - acc: 1.0000 - val_loss: 0.4623 - val_acc: 0.9048
Epoch 550/800
114/114 - 0s - loss: 4.0409e-04 - acc: 1.0000 - val_loss: 0.4581 - val_acc: 0.9048
Epoch 551/800
114/114 - 0s - loss: 3.9515e-04 - acc: 1.0000 - val_loss: 0.4651 - val_acc: 0.9048
Epoch 552/800
114/114 - 0s - loss: 3.9499e-04 - acc: 1.0000 - val_loss: 0.4687 - val_acc: 0.9048
Epoch 553/800
114/114 - 0s - loss: 3.8055e-04 - acc: 1.0000 - val_loss: 0.4632 - val_acc: 0.9048
Epoch 554/800
114/114 - 0s - loss: 3.7717e-04 - acc: 1.0000 - val_loss: 0.4609 - val_acc: 0.9048
Epoch 555/800
114/114 - 0s - loss: 3.8906e-04 - acc: 1.0000 - val_loss: 0.4593 - val_acc: 0.9048
Epoch 556/800
114/114 - 0s - loss: 3.8107e-04 - acc: 1.0000 - val_loss: 0.4616 - val_acc: 0.9048
Epoch 557/800
114/114 - 0s - loss: 4.4392e-04 - acc: 1.0000 - val_loss: 0.4729 - val_acc: 0.9048
Epoch 558/800
114/114 - 0s - loss: 4.1510e-04 - acc: 1.0000 - val_loss: 0.4636 - val_acc: 0.9048
Epoch 559/800
114/114 - 0s - loss: 3.7855e-04 - acc: 1.0000 - val_loss: 0.4653 - val_acc: 0.9048
Epoch 560/800
114/114 - 0s - loss: 3.8042e-04 - acc: 1.0000 - val_loss: 0.4590 - val_acc: 0.9048
Epoch 561/800
114/114 - 0s - loss: 3.7303e-04 - acc: 1.0000 - val_loss: 0.4606 - val_acc: 0.9048
Epoch 562/800
114/114 - 0s - loss: 3.7043e-04 - acc: 1.0000 - val_loss: 0.4655 - val_acc: 0.9048
Epoch 563/800
114/114 - 0s - loss: 3.8068e-04 - acc: 1.0000 - val_loss: 0.4720 - val_acc: 0.9048
Epoch 564/800
114/114 - 0s - loss: 3.7780e-04 - acc: 1.0000 - val_loss: 0.4714 - val_acc: 0.9048
Epoch 565/800
114/114 - 0s - loss: 3.7869e-04 - acc: 1.0000 - val_loss: 0.4644 - val_acc: 0.9048
Epoch 566/800
114/114 - 0s - loss: 3.6344e-04 - acc: 1.0000 - val_loss: 0.4623 - val_acc: 0.9048
Epoch 567/800
114/114 - 0s - loss: 4.0264e-04 - acc: 1.0000 - val_loss: 0.4706 - val_acc: 0.9048
Epoch 568/800
114/114 - 0s - loss: 3.6788e-04 - acc: 1.0000 - val_loss: 0.4667 - val_acc: 0.9048
Epoch 569/800
114/114 - 0s - loss: 3.5963e-04 - acc: 1.0000 - val_loss: 0.4634 - val_acc: 0.9048
Epoch 570/800
114/114 - 0s - loss: 3.5273e-04 - acc: 1.0000 - val_loss: 0.4655 - val_acc: 0.9048
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Epoch 571/800
114/114 - 0s - loss: 3.5995e-04 - acc: 1.0000 - val_loss: 0.4648 - val_acc: 0.9048
Epoch 572/800
114/114 - 0s - loss: 3.8233e-04 - acc: 1.0000 - val_loss: 0.4749 - val_acc: 0.9048
Epoch 573/800
114/114 - 0s - loss: 3.6145e-04 - acc: 1.0000 - val_loss: 0.4721 - val_acc: 0.9048
Epoch 574/800
114/114 - 0s - loss: 3.4436e-04 - acc: 1.0000 - val_loss: 0.4621 - val_acc: 0.9048
Epoch 575/800
114/114 - 0s - loss: 3.7212e-04 - acc: 1.0000 - val_loss: 0.4577 - val_acc: 0.9048
Epoch 576/800
114/114 - 0s - loss: 4.0041e-04 - acc: 1.0000 - val_loss: 0.4702 - val_acc: 0.9048
Epoch 577/800
114/114 - 0s - loss: 3.4773e-04 - acc: 1.0000 - val_loss: 0.4725 - val_acc: 0.9048
Epoch 578/800
114/114 - 0s - loss: 3.5736e-04 - acc: 1.0000 - val_loss: 0.4663 - val_acc: 0.9048
Epoch 579/800
114/114 - 0s - loss: 3.4562e-04 - acc: 1.0000 - val_loss: 0.4672 - val_acc: 0.9048
Epoch 580/800
114/114 - 0s - loss: 3.4625e-04 - acc: 1.0000 - val_loss: 0.4639 - val_acc: 0.9048
Epoch 581/800
114/114 - 0s - loss: 3.3979e-04 - acc: 1.0000 - val_loss: 0.4676 - val_acc: 0.9048
Epoch 582/800
114/114 - 0s - loss: 3.4864e-04 - acc: 1.0000 - val_loss: 0.4690 - val_acc: 0.9048
Epoch 583/800
114/114 - 0s - loss: 3.5283e-04 - acc: 1.0000 - val_loss: 0.4735 - val_acc: 0.9048
Epoch 584/800
114/114 - 0s - loss: 3.3548e-04 - acc: 1.0000 - val_loss: 0.4687 - val_acc: 0.9048
Epoch 585/800
114/114 - 0s - loss: 3.4451e-04 - acc: 1.0000 - val_loss: 0.4669 - val_acc: 0.9048
Epoch 586/800
114/114 - 0s - loss: 3.3514e-04 - acc: 1.0000 - val_loss: 0.4660 - val_acc: 0.9048
Epoch 587/800
114/114 - 0s - loss: 3.3649e-04 - acc: 1.0000 - val_loss: 0.4674 - val_acc: 0.9048
Epoch 588/800
114/114 - 0s - loss: 3.3076e-04 - acc: 1.0000 - val_loss: 0.4687 - val_acc: 0.9048
Epoch 589/800
114/114 - 0s - loss: 3.6461e-04 - acc: 1.0000 - val_loss: 0.4758 - val_acc: 0.9048
Epoch 590/800
114/114 - 0s - loss: 3.4537e-04 - acc: 1.0000 - val_loss: 0.4737 - val_acc: 0.9048
Epoch 591/800
114/114 - 0s - loss: 3.3367e-04 - acc: 1.0000 - val_loss: 0.4623 - val_acc: 0.9048
Epoch 592/800
114/114 - 0s - loss: 3.8581e-04 - acc: 1.0000 - val_loss: 0.4597 - val_acc: 0.9048
Epoch 593/800
114/114 - 0s - loss: 3.2942e-04 - acc: 1.0000 - val_loss: 0.4731 - val_acc: 0.9048
Epoch 594/800
114/114 - 0s - loss: 3.7724e-04 - acc: 1.0000 - val_loss: 0.4873 - val_acc: 0.9048
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Epoch 595/800
114/114 - 0s - loss: 3.6513e-04 - acc: 1.0000 - val_loss: 0.4804 - val_acc: 0.9048
Epoch 596/800
114/114 - 0s - loss: 3.1057e-04 - acc: 1.0000 - val_loss: 0.4656 - val_acc: 0.9048
Epoch 597/800
114/114 - 0s - loss: 3.2126e-04 - acc: 1.0000 - val_loss: 0.4613 - val_acc: 0.9048
Epoch 598/800
114/114 - 0s - loss: 3.6146e-04 - acc: 1.0000 - val_loss: 0.4662 - val_acc: 0.9048
Epoch 599/800
114/114 - 0s - loss: 3.2353e-04 - acc: 1.0000 - val_loss: 0.4676 - val_acc: 0.9048
Epoch 600/800
114/114 - 0s - loss: 3.3385e-04 - acc: 1.0000 - val_loss: 0.4747 - val_acc: 0.9048
Epoch 601/800
114/114 - 0s - loss: 3.1096e-04 - acc: 1.0000 - val_loss: 0.4736 - val_acc: 0.9048
Epoch 602/800
114/114 - 0s - loss: 3.1308e-04 - acc: 1.0000 - val_loss: 0.4729 - val_acc: 0.9048
Epoch 603/800
114/114 - 0s - loss: 3.0885e-04 - acc: 1.0000 - val_loss: 0.4707 - val_acc: 0.9048
Epoch 604/800
114/114 - 0s - loss: 3.0906e-04 - acc: 1.0000 - val_loss: 0.4704 - val_acc: 0.9048
Epoch 605/800
114/114 - 0s - loss: 3.1914e-04 - acc: 1.0000 - val_loss: 0.4695 - val_acc: 0.9048
Epoch 606/800
114/114 - 0s - loss: 3.1889e-04 - acc: 1.0000 - val_loss: 0.4777 - val_acc: 0.9048
Epoch 607/800
114/114 - 0s - loss: 3.1379e-04 - acc: 1.0000 - val_loss: 0.4763 - val_acc: 0.9048
Epoch 608/800
114/114 - 0s - loss: 3.0874e-04 - acc: 1.0000 - val_loss: 0.4735 - val_acc: 0.9048
Epoch 609/800
114/114 - 0s - loss: 3.2838e-04 - acc: 1.0000 - val_loss: 0.4702 - val_acc: 0.9048
Epoch 610/800
114/114 - 0s - loss: 3.0202e-04 - acc: 1.0000 - val_loss: 0.4753 - val_acc: 0.9048
Epoch 611/800
114/114 - 0s - loss: 3.0392e-04 - acc: 1.0000 - val_loss: 0.4803 - val_acc: 0.9048
Epoch 612/800
114/114 - 0s - loss: 3.1182e-04 - acc: 1.0000 - val_loss: 0.4790 - val_acc: 0.9048
Epoch 613/800
114/114 - 0s - loss: 3.0446e-04 - acc: 1.0000 - val_loss: 0.4717 - val_acc: 0.9048
Epoch 614/800
114/114 - 0s - loss: 3.0448e-04 - acc: 1.0000 - val_loss: 0.4720 - val_acc: 0.9048
Epoch 615/800
114/114 - 0s - loss: 2.9629e-04 - acc: 1.0000 - val_loss: 0.4726 - val_acc: 0.9048
Epoch 616/800
114/114 - 0s - loss: 3.4063e-04 - acc: 1.0000 - val_loss: 0.4697 - val_acc: 0.9048
Epoch 617/800
114/114 - 0s - loss: 3.3343e-04 - acc: 1.0000 - val_loss: 0.4869 - val_acc: 0.9048
Epoch 618/800
114/114 - 0s - loss: 3.1659e-04 - acc: 1.0000 - val_loss: 0.4851 - val_acc: 0.9048
```

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Epoch 619/800
114/114 - 0s - loss: 3.2619e-04 - acc: 1.0000 - val_loss: 0.4744 - val_acc: 0.9048
Epoch 620/800
114/114 - 0s - loss: 2.9082e-04 - acc: 1.0000 - val_loss: 0.4739 - val_acc: 0.9048
Epoch 621/800
114/114 - 0s - loss: 2.8913e-04 - acc: 1.0000 - val_loss: 0.4751 - val_acc: 0.9048
Epoch 622/800
114/114 - 0s - loss: 2.9605e-04 - acc: 1.0000 - val_loss: 0.4786 - val_acc: 0.9048
Epoch 623/800
114/114 - 0s - loss: 3.0070e-04 - acc: 1.0000 - val_loss: 0.4735 - val_acc: 0.9048
Epoch 624/800
114/114 - 0s - loss: 2.9445e-04 - acc: 1.0000 - val_loss: 0.4778 - val_acc: 0.9048
Epoch 625/800
114/114 - 0s - loss: 2.8771e-04 - acc: 1.0000 - val_loss: 0.4780 - val_acc: 0.9048
Epoch 626/800
114/114 - 0s - loss: 2.8297e-04 - acc: 1.0000 - val_loss: 0.4752 - val_acc: 0.9048
Epoch 627/800
114/114 - 0s - loss: 2.8894e-04 - acc: 1.0000 - val_loss: 0.4733 - val_acc: 0.9048
Epoch 628/800
114/114 - 0s - loss: 2.8451e-04 - acc: 1.0000 - val_loss: 0.4773 - val_acc: 0.9048
Epoch 629/800
114/114 - 0s - loss: 2.9121e-04 - acc: 1.0000 - val_loss: 0.4817 - val_acc: 0.9048
Epoch 630/800
114/114 - 0s - loss: 2.9691e-04 - acc: 1.0000 - val_loss: 0.4816 - val_acc: 0.9048
Epoch 631/800
114/114 - 0s - loss: 2.8329e-04 - acc: 1.0000 - val_loss: 0.4743 - val_acc: 0.9048
Epoch 632/800
114/114 - 0s - loss: 2.8705e-04 - acc: 1.0000 - val_loss: 0.4728 - val_acc: 0.9048
Epoch 633/800
114/114 - 0s - loss: 2.8158e-04 - acc: 1.0000 - val_loss: 0.4749 - val_acc: 0.9048
Epoch 634/800
114/114 - 0s - loss: 2.9537e-04 - acc: 1.0000 - val_loss: 0.4844 - val_acc: 0.9048
Epoch 635/800
114/114 - 0s - loss: 2.7994e-04 - acc: 1.0000 - val_loss: 0.4820 - val_acc: 0.9048
Epoch 636/800
114/114 - 0s - loss: 2.8070e-04 - acc: 1.0000 - val_loss: 0.4760 - val_acc: 0.9048
Epoch 637/800
114/114 - 0s - loss: 2.8520e-04 - acc: 1.0000 - val_loss: 0.4727 - val_acc: 0.9048
Epoch 638/800
114/114 - 0s - loss: 2.8236e-04 - acc: 1.0000 - val_loss: 0.4751 - val_acc: 0.9048
Epoch 639/800
114/114 - 0s - loss: 2.6468e-04 - acc: 1.0000 - val_loss: 0.4826 - val_acc: 0.9048
Epoch 640/800
114/114 - 0s - loss: 2.7343e-04 - acc: 1.0000 - val_loss: 0.4882 - val_acc: 0.9048
Epoch 641/800
114/114 - 0s - loss: 2.8681e-04 - acc: 1.0000 - val_loss: 0.4840 - val_acc: 0.9048
Epoch 642/800
114/114 - 0s - loss: 2.7398e-04 - acc: 1.0000 - val_loss: 0.4798 - val_acc: 0.9048
```

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Epoch 643/800
114/114 - 0s - loss: 2.6624e-04 - acc: 1.0000 - val_loss: 0.4784 - val_acc: 0.9048
Epoch 644/800
114/114 - 0s - loss: 2.6652e-04 - acc: 1.0000 - val_loss: 0.4775 - val_acc: 0.9048
Epoch 645/800
114/114 - 0s - loss: 2.7750e-04 - acc: 1.0000 - val_loss: 0.4751 - val_acc: 0.9048
Epoch 646/800
114/114 - 0s - loss: 2.6414e-04 - acc: 1.0000 - val_loss: 0.4804 - val_acc: 0.9048
Epoch 647/800
114/114 - 0s - loss: 2.6391e-04 - acc: 1.0000 - val_loss: 0.4842 - val_acc: 0.9048
Epoch 648/800
114/114 - 0s - loss: 2.6934e-04 - acc: 1.0000 - val_loss: 0.4831 - val_acc: 0.9048
Epoch 649/800
114/114 - 0s - loss: 2.6155e-04 - acc: 1.0000 - val_loss: 0.4793 - val_acc: 0.9048
Epoch 650/800
114/114 - 0s - loss: 2.6030e-04 - acc: 1.0000 - val_loss: 0.4776 - val_acc: 0.9048
Epoch 651/800
114/114 - 0s - loss: 2.6152e-04 - acc: 1.0000 - val_loss: 0.4795 - val_acc: 0.9048
Epoch 652/800
114/114 - 0s - loss: 2.6227e-04 - acc: 1.0000 - val_loss: 0.4803 - val_acc: 0.9048
Epoch 653/800
114/114 - 0s - loss: 2.5906e-04 - acc: 1.0000 - val_loss: 0.4817 - val_acc: 0.9048
Epoch 654/800
114/114 - 0s - loss: 2.6371e-04 - acc: 1.0000 - val_loss: 0.4823 - val_acc: 0.9048
Epoch 655/800
114/114 - 0s - loss: 2.5617e-04 - acc: 1.0000 - val_loss: 0.4849 - val_acc: 0.9048
Epoch 656/800
114/114 - 0s - loss: 2.5847e-04 - acc: 1.0000 - val_loss: 0.4874 - val_acc: 0.9048
Epoch 657/800
114/114 - 0s - loss: 2.6806e-04 - acc: 1.0000 - val_loss: 0.4839 - val_acc: 0.9048
Epoch 658/800
114/114 - 0s - loss: 2.7037e-04 - acc: 1.0000 - val_loss: 0.4847 - val_acc: 0.9048
Epoch 659/800
114/114 - 0s - loss: 2.6245e-04 - acc: 1.0000 - val_loss: 0.4772 - val_acc: 0.9048
Epoch 660/800
114/114 - 0s - loss: 2.6930e-04 - acc: 1.0000 - val_loss: 0.4742 - val_acc: 0.9048
Epoch 661/800
114/114 - 0s - loss: 2.5894e-04 - acc: 1.0000 - val_loss: 0.4816 - val_acc: 0.9048
Epoch 662/800
114/114 - 0s - loss: 2.5773e-04 - acc: 1.0000 - val_loss: 0.4897 - val_acc: 0.9048
Epoch 663/800
114/114 - 0s - loss: 2.6186e-04 - acc: 1.0000 - val_loss: 0.4856 - val_acc: 0.9048
Epoch 664/800
114/114 - 0s - loss: 2.5342e-04 - acc: 1.0000 - val_loss: 0.4862 - val_acc: 0.9048
Epoch 665/800
114/114 - 0s - loss: 2.5099e-04 - acc: 1.0000 - val_loss: 0.4841 - val_acc: 0.9048
Epoch 666/800
114/114 - 0s - loss: 2.5279e-04 - acc: 1.0000 - val_loss: 0.4811 - val_acc: 0.9048
```

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Epoch 667/800
114/114 - 0s - loss: 2.4542e-04 - acc: 1.0000 - val_loss: 0.4788 - val_acc: 0.9048
Epoch 668/800
114/114 - 0s - loss: 2.5320e-04 - acc: 1.0000 - val_loss: 0.4791 - val_acc: 0.9048
Epoch 669/800
114/114 - 0s - loss: 2.5581e-04 - acc: 1.0000 - val_loss: 0.4784 - val_acc: 0.9048
Epoch 670/800
114/114 - 0s - loss: 2.4437e-04 - acc: 1.0000 - val_loss: 0.4856 - val_acc: 0.9048
Epoch 671/800
114/114 - 0s - loss: 2.8662e-04 - acc: 1.0000 - val_loss: 0.4945 - val_acc: 0.9048
Epoch 672/800
114/114 - 0s - loss: 2.6347e-04 - acc: 1.0000 - val_loss: 0.4811 - val_acc: 0.9048
Epoch 673/800
114/114 - 0s - loss: 2.7925e-04 - acc: 1.0000 - val_loss: 0.4742 - val_acc: 0.9048
Epoch 674/800
114/114 - 0s - loss: 2.5201e-04 - acc: 1.0000 - val_loss: 0.4798 - val_acc: 0.9048
Epoch 675/800
114/114 - 0s - loss: 2.3282e-04 - acc: 1.0000 - val_loss: 0.4904 - val_acc: 0.9048
Epoch 676/800
114/114 - 0s - loss: 2.4697e-04 - acc: 1.0000 - val_loss: 0.4922 - val_acc: 0.9048
Epoch 677/800
114/114 - 0s - loss: 2.4810e-04 - acc: 1.0000 - val_loss: 0.4936 - val_acc: 0.9048
Epoch 678/800
114/114 - 0s - loss: 2.5402e-04 - acc: 1.0000 - val_loss: 0.4900 - val_acc: 0.9048
Epoch 679/800
114/114 - 0s - loss: 2.2929e-04 - acc: 1.0000 - val_loss: 0.4803 - val_acc: 0.9048
Epoch 680/800
114/114 - 0s - loss: 2.3303e-04 - acc: 1.0000 - val_loss: 0.4747 - val_acc: 0.9048
Epoch 681/800
114/114 - 0s - loss: 2.5566e-04 - acc: 1.0000 - val_loss: 0.4765 - val_acc: 0.9048
Epoch 682/800
114/114 - 0s - loss: 2.5037e-04 - acc: 1.0000 - val_loss: 0.4818 - val_acc: 0.9048
Epoch 683/800
114/114 - 0s - loss: 2.2777e-04 - acc: 1.0000 - val_loss: 0.4885 - val_acc: 0.9048
Epoch 684/800
114/114 - 0s - loss: 2.5841e-04 - acc: 1.0000 - val_loss: 0.4982 - val_acc: 0.9048
Epoch 685/800
114/114 - 0s - loss: 2.4781e-04 - acc: 1.0000 - val_loss: 0.4931 - val_acc: 0.9048
Epoch 686/800
114/114 - 0s - loss: 2.2965e-04 - acc: 1.0000 - val_loss: 0.4817 - val_acc: 0.9048
Epoch 687/800
114/114 - 0s - loss: 2.3163e-04 - acc: 1.0000 - val_loss: 0.4783 - val_acc: 0.9048
Epoch 688/800
114/114 - 0s - loss: 2.4255e-04 - acc: 1.0000 - val_loss: 0.4792 - val_acc: 0.9048
Epoch 689/800
114/114 - 0s - loss: 2.2964e-04 - acc: 1.0000 - val_loss: 0.4882 - val_acc: 0.9048
Epoch 690/800
114/114 - 0s - loss: 2.3029e-04 - acc: 1.0000 - val_loss: 0.4947 - val_acc: 0.9048
```

```
Epoch 691/800
114/114 - 0s - loss: 2.3594e-04 - acc: 1.0000 - val_loss: 0.4931 - val_acc: 0.9048
Epoch 692/800
114/114 - 0s - loss: 2.3495e-04 - acc: 1.0000 - val_loss: 0.4840 - val_acc: 0.9048
Epoch 693/800
114/114 - 0s - loss: 2.3624e-04 - acc: 1.0000 - val_loss: 0.4804 - val_acc: 0.9048
Epoch 694/800
114/114 - 0s - loss: 2.5815e-04 - acc: 1.0000 - val_loss: 0.4795 - val_acc: 0.9048
Epoch 695/800
114/114 - 0s - loss: 2.1968e-04 - acc: 1.0000 - val_loss: 0.4922 - val_acc: 0.9048
Epoch 696/800
114/114 - 0s - loss: 2.2427e-04 - acc: 1.0000 - val_loss: 0.5010 - val_acc: 0.9048
Epoch 697/800
114/114 - 0s - loss: 2.4176e-04 - acc: 1.0000 - val_loss: 0.4958 - val_acc: 0.9048
Epoch 698/800
114/114 - 0s - loss: 2.2367e-04 - acc: 1.0000 - val_loss: 0.4879 - val_acc: 0.9048
Epoch 699/800
114/114 - 0s - loss: 2.1963e-04 - acc: 1.0000 - val_loss: 0.4831 - val_acc: 0.9048
Epoch 700/800
114/114 - 0s - loss: 2.3389e-04 - acc: 1.0000 - val_loss: 0.4811 - val_acc: 0.9048
Epoch 701/800
114/114 - 0s - loss: 2.3539e-04 - acc: 1.0000 - val_loss: 0.4924 - val_acc: 0.9048
Epoch 702/800
114/114 - 0s - loss: 2.2092e-04 - acc: 1.0000 - val_loss: 0.4922 - val_acc: 0.9048
Epoch 703/800
114/114 - 0s - loss: 2.1958e-04 - acc: 1.0000 - val_loss: 0.4917 - val_acc: 0.9048
Epoch 704/800
114/114 - 0s - loss: 2.2390e-04 - acc: 1.0000 - val_loss: 0.4955 - val_acc: 0.9048
Epoch 705/800
114/114 - 0s - loss: 2.1819e-04 - acc: 1.0000 - val_loss: 0.4898 - val_acc: 0.9048
Epoch 706/800
114/114 - 0s - loss: 2.2909e-04 - acc: 1.0000 - val_loss: 0.4859 - val_acc: 0.9048
Epoch 707/800
114/114 - 0s - loss: 2.1830e-04 - acc: 1.0000 - val_loss: 0.4885 - val_acc: 0.9048
Epoch 708/800
114/114 - 0s - loss: 2.1265e-04 - acc: 1.0000 - val_loss: 0.4921 - val_acc: 0.9048
Epoch 709/800
114/114 - 0s - loss: 2.1130e-04 - acc: 1.0000 - val_loss: 0.4962 - val_acc: 0.9048
Epoch 710/800
114/114 - 0s - loss: 2.1473e-04 - acc: 1.0000 - val_loss: 0.4957 - val_acc: 0.9048
Epoch 711/800
114/114 - 0s - loss: 2.1590e-04 - acc: 1.0000 - val_loss: 0.4949 - val_acc: 0.9048
Epoch 712/800
114/114 - 0s - loss: 2.1574e-04 - acc: 1.0000 - val_loss: 0.4891 - val_acc: 0.9048
Epoch 713/800
114/114 - 0s - loss: 2.1878e-04 - acc: 1.0000 - val_loss: 0.4869 - val_acc: 0.9048
Epoch 714/800
114/114 - 0s - loss: 2.1119e-04 - acc: 1.0000 - val_loss: 0.4888 - val_acc: 0.9048
```

```
Epoch 715/800
114/114 - 0s - loss: 2.3181e-04 - acc: 1.0000 - val_loss: 0.4962 - val_acc: 0.9048
Epoch 716/800
114/114 - 0s - loss: 2.1700e-04 - acc: 1.0000 - val_loss: 0.4889 - val_acc: 0.9048
Epoch 717/800
114/114 - 0s - loss: 2.1092e-04 - acc: 1.0000 - val_loss: 0.4895 - val_acc: 0.9048
Epoch 718/800
114/114 - 0s - loss: 2.1101e-04 - acc: 1.0000 - val_loss: 0.4926 - val_acc: 0.9048
Epoch 719/800
114/114 - 0s - loss: 2.0630e-04 - acc: 1.0000 - val_loss: 0.4906 - val_acc: 0.9048
Epoch 720/800
114/114 - 0s - loss: 2.0901e-04 - acc: 1.0000 - val_loss: 0.4923 - val_acc: 0.9048
Epoch 721/800
114/114 - 0s - loss: 2.0371e-04 - acc: 1.0000 - val_loss: 0.4898 - val_acc: 0.9048
Epoch 722/800
114/114 - 0s - loss: 2.0608e-04 - acc: 1.0000 - val_loss: 0.4901 - val_acc: 0.9048
Epoch 723/800
114/114 - 0s - loss: 2.0320e-04 - acc: 1.0000 - val_loss: 0.4882 - val_acc: 0.9048
Epoch 724/800
114/114 - 0s - loss: 2.0996e-04 - acc: 1.0000 - val_loss: 0.4874 - val_acc: 0.9048
Epoch 725/800
114/114 - 0s - loss: 1.9983e-04 - acc: 1.0000 - val_loss: 0.4929 - val_acc: 0.9048
Epoch 726/800
114/114 - 0s - loss: 2.2321e-04 - acc: 1.0000 - val_loss: 0.5025 - val_acc: 0.9048
Epoch 727/800
114/114 - 0s - loss: 2.1462e-04 - acc: 1.0000 - val_loss: 0.4942 - val_acc: 0.9048
Epoch 728/800
114/114 - 0s - loss: 2.0625e-04 - acc: 1.0000 - val_loss: 0.4873 - val_acc: 0.9048
Epoch 729/800
114/114 - 0s - loss: 2.0423e-04 - acc: 1.0000 - val_loss: 0.4882 - val_acc: 0.9048
Epoch 730/800
114/114 - 0s - loss: 2.2651e-04 - acc: 1.0000 - val_loss: 0.4974 - val_acc: 0.9048
Epoch 731/800
114/114 - 0s - loss: 2.0029e-04 - acc: 1.0000 - val_loss: 0.4951 - val_acc: 0.9048
Epoch 732/800
114/114 - 0s - loss: 2.0574e-04 - acc: 1.0000 - val_loss: 0.4893 - val_acc: 0.9048
Epoch 733/800
114/114 - 0s - loss: 1.9983e-04 - acc: 1.0000 - val_loss: 0.4907 - val_acc: 0.9048
Epoch 734/800
114/114 - 0s - loss: 2.0096e-04 - acc: 1.0000 - val_loss: 0.4896 - val_acc: 0.9048
Epoch 735/800
114/114 - 0s - loss: 2.0113e-04 - acc: 1.0000 - val_loss: 0.4962 - val_acc: 0.9048
Epoch 736/800
114/114 - 0s - loss: 1.9812e-04 - acc: 1.0000 - val_loss: 0.4983 - val_acc: 0.9048
Epoch 737/800
114/114 - 0s - loss: 2.0382e-04 - acc: 1.0000 - val_loss: 0.4972 - val_acc: 0.9048
Epoch 738/800
114/114 - 0s - loss: 1.9559e-04 - acc: 1.0000 - val_loss: 0.4888 - val_acc: 0.9048
```

```
Epoch 739/800
114/114 - 0s - loss: 2.0437e-04 - acc: 1.0000 - val_loss: 0.4915 - val_acc: 0.9048
Epoch 740/800
114/114 - 0s - loss: 1.9606e-04 - acc: 1.0000 - val_loss: 0.4919 - val_acc: 0.9048
Epoch 741/800
114/114 - 0s - loss: 1.9469e-04 - acc: 1.0000 - val_loss: 0.4909 - val_acc: 0.9048
Epoch 742/800
114/114 - 0s - loss: 1.9453e-04 - acc: 1.0000 - val_loss: 0.4950 - val_acc: 0.9048
Epoch 743/800
114/114 - 0s - loss: 1.9242e-04 - acc: 1.0000 - val_loss: 0.4968 - val_acc: 0.9048
Epoch 744/800
114/114 - 0s - loss: 1.9081e-04 - acc: 1.0000 - val_loss: 0.4970 - val_acc: 0.9048
Epoch 745/800
114/114 - 0s - loss: 1.8834e-04 - acc: 1.0000 - val_loss: 0.4949 - val_acc: 0.9048
Epoch 746/800
114/114 - 0s - loss: 1.8805e-04 - acc: 1.0000 - val_loss: 0.4942 - val_acc: 0.9048
Epoch 747/800
114/114 - 0s - loss: 1.8710e-04 - acc: 1.0000 - val_loss: 0.4930 - val_acc: 0.9048
Epoch 748/800
114/114 - 0s - loss: 1.8676e-04 - acc: 1.0000 - val_loss: 0.4937 - val_acc: 0.9048
Epoch 749/800
114/114 - 0s - loss: 1.8837e-04 - acc: 1.0000 - val_loss: 0.4938 - val_acc: 0.9048
Epoch 750/800
114/114 - 0s - loss: 1.8705e-04 - acc: 1.0000 - val_loss: 0.4960 - val_acc: 0.9048
Epoch 751/800
114/114 - 0s - loss: 1.9568e-04 - acc: 1.0000 - val_loss: 0.5042 - val_acc: 0.9048
Epoch 752/800
114/114 - 0s - loss: 1.9132e-04 - acc: 1.0000 - val_loss: 0.4984 - val_acc: 0.9048
Epoch 753/800
114/114 - 0s - loss: 1.9936e-04 - acc: 1.0000 - val_loss: 0.4926 - val_acc: 0.9048
Epoch 754/800
114/114 - 0s - loss: 1.8601e-04 - acc: 1.0000 - val_loss: 0.4940 - val_acc: 0.9048
Epoch 755/800
114/114 - 0s - loss: 2.0652e-04 - acc: 1.0000 - val_loss: 0.5026 - val_acc: 0.9048
Epoch 756/800
114/114 - 0s - loss: 1.8503e-04 - acc: 1.0000 - val_loss: 0.4989 - val_acc: 0.9048
Epoch 757/800
114/114 - 0s - loss: 1.7997e-04 - acc: 1.0000 - val_loss: 0.4930 - val_acc: 0.9048
Epoch 758/800
114/114 - 0s - loss: 1.9484e-04 - acc: 1.0000 - val_loss: 0.4892 - val_acc: 0.9048
Epoch 759/800
114/114 - 0s - loss: 1.8528e-04 - acc: 1.0000 - val_loss: 0.4976 - val_acc: 0.9048
Epoch 760/800
114/114 - 0s - loss: 1.8063e-04 - acc: 1.0000 - val_loss: 0.5046 - val_acc: 0.9048
Epoch 761/800
114/114 - 0s - loss: 1.8909e-04 - acc: 1.0000 - val_loss: 0.5057 - val_acc: 0.9048
Epoch 762/800
114/114 - 0s - loss: 1.8404e-04 - acc: 1.0000 - val_loss: 0.4960 - val_acc: 0.9048
```

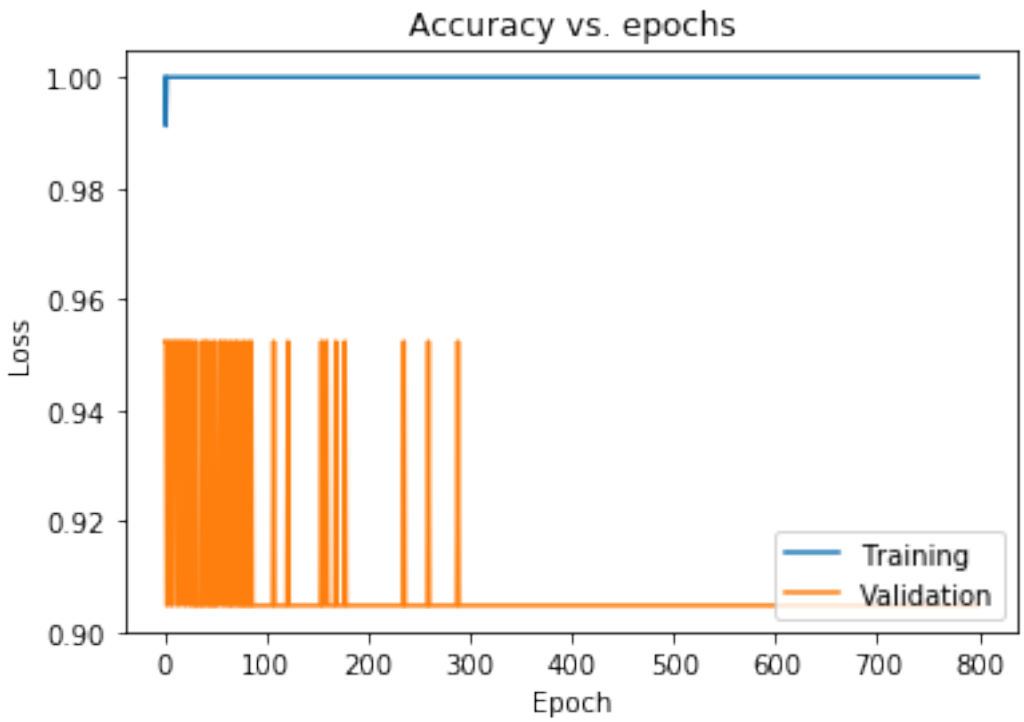
```
Epoch 763/800
114/114 - 0s - loss: 2.0476e-04 - acc: 1.0000 - val_loss: 0.4890 - val_acc: 0.9048
Epoch 764/800
114/114 - 0s - loss: 1.9511e-04 - acc: 1.0000 - val_loss: 0.4986 - val_acc: 0.9048
Epoch 765/800
114/114 - 0s - loss: 1.7599e-04 - acc: 1.0000 - val_loss: 0.5038 - val_acc: 0.9048
Epoch 766/800
114/114 - 0s - loss: 1.8063e-04 - acc: 1.0000 - val_loss: 0.5016 - val_acc: 0.9048
Epoch 767/800
114/114 - 0s - loss: 1.8456e-04 - acc: 1.0000 - val_loss: 0.4984 - val_acc: 0.9048
Epoch 768/800
114/114 - 0s - loss: 1.7836e-04 - acc: 1.0000 - val_loss: 0.5021 - val_acc: 0.9048
Epoch 769/800
114/114 - 0s - loss: 1.7642e-04 - acc: 1.0000 - val_loss: 0.5006 - val_acc: 0.9048
Epoch 770/800
114/114 - 0s - loss: 1.8016e-04 - acc: 1.0000 - val_loss: 0.4948 - val_acc: 0.9048
Epoch 771/800
114/114 - 0s - loss: 1.7415e-04 - acc: 1.0000 - val_loss: 0.4970 - val_acc: 0.9048
Epoch 772/800
114/114 - 0s - loss: 1.8043e-04 - acc: 1.0000 - val_loss: 0.5028 - val_acc: 0.9048
Epoch 773/800
114/114 - 0s - loss: 1.7158e-04 - acc: 1.0000 - val_loss: 0.5002 - val_acc: 0.9048
Epoch 774/800
114/114 - 0s - loss: 1.7058e-04 - acc: 1.0000 - val_loss: 0.4986 - val_acc: 0.9048
Epoch 775/800
114/114 - 0s - loss: 1.7684e-04 - acc: 1.0000 - val_loss: 0.4969 - val_acc: 0.9048
Epoch 776/800
114/114 - 0s - loss: 1.7428e-04 - acc: 1.0000 - val_loss: 0.4997 - val_acc: 0.9048
Epoch 777/800
114/114 - 0s - loss: 1.9224e-04 - acc: 1.0000 - val_loss: 0.5086 - val_acc: 0.9048
Epoch 778/800
114/114 - 0s - loss: 1.7751e-04 - acc: 1.0000 - val_loss: 0.5009 - val_acc: 0.9048
Epoch 779/800
114/114 - 0s - loss: 1.7917e-04 - acc: 1.0000 - val_loss: 0.4956 - val_acc: 0.9048
Epoch 780/800
114/114 - 0s - loss: 1.7197e-04 - acc: 1.0000 - val_loss: 0.5019 - val_acc: 0.9048
Epoch 781/800
114/114 - 0s - loss: 1.6694e-04 - acc: 1.0000 - val_loss: 0.5042 - val_acc: 0.9048
Epoch 782/800
114/114 - 0s - loss: 1.8142e-04 - acc: 1.0000 - val_loss: 0.4997 - val_acc: 0.9048
Epoch 783/800
114/114 - 0s - loss: 1.7561e-04 - acc: 1.0000 - val_loss: 0.5001 - val_acc: 0.9048
Epoch 784/800
114/114 - 0s - loss: 1.6648e-04 - acc: 1.0000 - val_loss: 0.5093 - val_acc: 0.9048
Epoch 785/800
114/114 - 0s - loss: 1.7093e-04 - acc: 1.0000 - val_loss: 0.5103 - val_acc: 0.9048
Epoch 786/800
114/114 - 0s - loss: 1.7152e-04 - acc: 1.0000 - val_loss: 0.5045 - val_acc: 0.9048
```

```
Epoch 787/800
114/114 - 0s - loss: 1.8878e-04 - acc: 1.0000 - val_loss: 0.4955 - val_acc: 0.9048
Epoch 788/800
114/114 - 0s - loss: 1.7217e-04 - acc: 1.0000 - val_loss: 0.5026 - val_acc: 0.9048
Epoch 789/800
114/114 - 0s - loss: 1.6386e-04 - acc: 1.0000 - val_loss: 0.5023 - val_acc: 0.9048
Epoch 790/800
114/114 - 0s - loss: 1.6415e-04 - acc: 1.0000 - val_loss: 0.5019 - val_acc: 0.9048
Epoch 791/800
114/114 - 0s - loss: 1.6139e-04 - acc: 1.0000 - val_loss: 0.5043 - val_acc: 0.9048
Epoch 792/800
114/114 - 0s - loss: 1.6211e-04 - acc: 1.0000 - val_loss: 0.5029 - val_acc: 0.9048
Epoch 793/800
114/114 - 0s - loss: 1.6323e-04 - acc: 1.0000 - val_loss: 0.5017 - val_acc: 0.9048
Epoch 794/800
114/114 - 0s - loss: 1.6355e-04 - acc: 1.0000 - val_loss: 0.5054 - val_acc: 0.9048
Epoch 795/800
114/114 - 0s - loss: 1.5981e-04 - acc: 1.0000 - val_loss: 0.5056 - val_acc: 0.9048
Epoch 796/800
114/114 - 0s - loss: 1.5906e-04 - acc: 1.0000 - val_loss: 0.5005 - val_acc: 0.9048
Epoch 797/800
114/114 - 0s - loss: 1.5968e-04 - acc: 1.0000 - val_loss: 0.4993 - val_acc: 0.9048
Epoch 798/800
114/114 - 0s - loss: 1.5533e-04 - acc: 1.0000 - val_loss: 0.5020 - val_acc: 0.9048
Epoch 799/800
114/114 - 0s - loss: 1.5501e-04 - acc: 1.0000 - val_loss: 0.5065 - val_acc: 0.9048
Epoch 800/800
114/114 - 0s - loss: 1.6393e-04 - acc: 1.0000 - val_loss: 0.5017 - val_acc: 0.9048
```

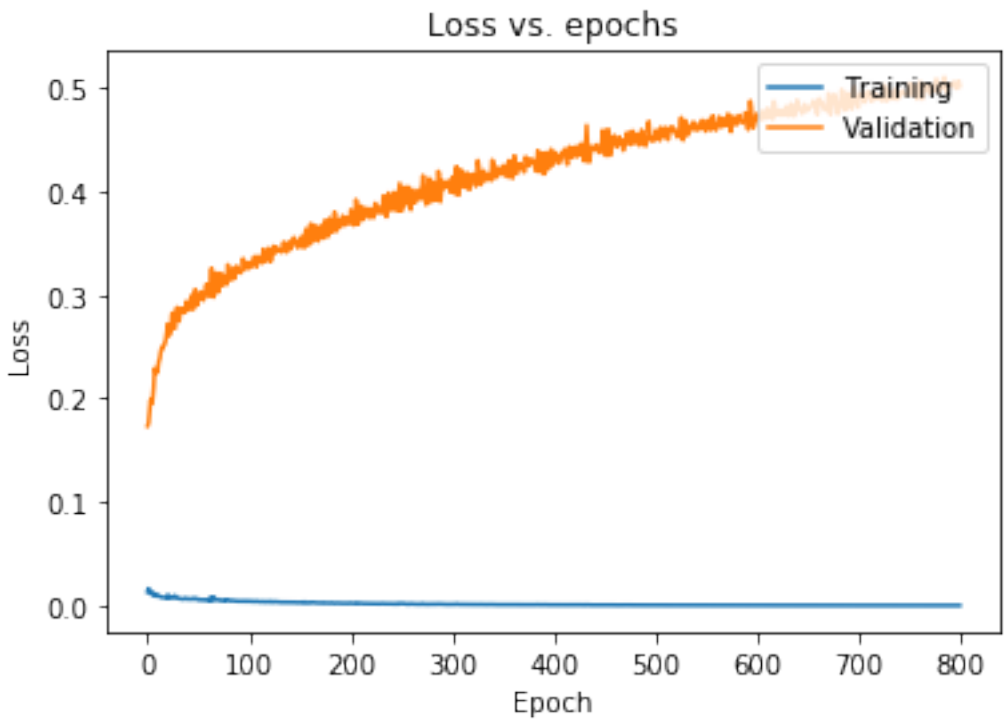
Plot the learning curves We will now plot two graphs: * Epoch vs accuracy * Epoch vs loss

In [46]:
```
# Run this cell to plot the epoch vs accuracy graph

    try:
        plt.plot(history.history['accuracy'])
        plt.plot(history.history['val_accuracy'])
    except KeyError:
        plt.plot(history.history['acc'])
        plt.plot(history.history['val_acc'])
    plt.title('Accuracy vs. epochs')
    plt.ylabel('Loss')
    plt.xlabel('Epoch')
    plt.legend(['Training', 'Validation'], loc='lower right')
    plt.show()
```




```
In [47]: #Run this cell to plot the epoch vs loss graph
         plt.plot(history.history['loss'])
         plt.plot(history.history['val_loss'])
         plt.title('Loss vs. epochs')
         plt.ylabel('Loss')
         plt.xlabel('Epoch')
         plt.legend(['Training', 'Validation'], loc='upper right')
         plt.show()
```



Oh no! We have overfit our dataset. You should now try to now try to mitigate this overfitting.

Reducing overfitting in the model You should now define a new regularised model. The specs for the regularised model are the same as our original model, with the addition of two dropout layers, weight decay, and a batch normalisation layer.

In particular:

- Add a dropout layer after the 3rd Dense layer
- Then there should be two more Dense layers with 128 units before a batch normalisation layer
- Following this, two more Dense layers with 64 units and then another Dropout layer
- Two more Dense layers with 64 units and then the final 3-way softmax layer
- Add weight decay (l2 kernel regularisation) in all Dense layers except the final softmax layer

```
In [60]: #### GRADED CELL ####

         # Complete the following function.
         # Make sure to not change the function name or arguments.

         def get_regularised_model(input_shape, dropout_rate, weight_decay):
             """
             This function should build a regularised Sequential model according to the above
             The dropout_rate argument in the function should be used to set the Dropout rate
             L2 kernel regularisation (weight decay) should be added using the weight_decay ar
```

```
    set the weight decay coefficient in all Dense layers that use L2 regularisation.
    Ensure the weights are initialised by providing the input_shape argument in the f
    function argument input_shape.
    Your function should return the model.
    """
    model = Sequential([
        Dense(64, activation="relu", input_shape=input_shape,
              kernel_initializer=tf.keras.initializers.he_uniform(),
              bias_initializer=tf.keras.initializers.Constant(1),
              kernel_regularizer=tf.keras.regularizers.l2(weight_decay)),
        Dense(128, activation="relu", kernel_regularizer=tf.keras.regularizers.l2(weig
        Dense(128, activation="relu", kernel_regularizer=tf.keras.regularizers.l2(weig
        Dropout(dropout_rate),
        Dense(128, activation="relu", kernel_regularizer=tf.keras.regularizers.l2(weig
        Dense(128, activation="relu", kernel_regularizer=tf.keras.regularizers.l2(weig
        BatchNormalization(),
        Dense(64, activation="relu", kernel_regularizer=tf.keras.regularizers.l2(weigh
        Dense(64, activation="relu", kernel_regularizer=tf.keras.regularizers.l2(weigh
        Dropout(dropout_rate),
        Dense(64, activation="relu", kernel_regularizer=tf.keras.regularizers.l2(weigh
        Dense(64, activation="relu", kernel_regularizer=tf.keras.regularizers.l2(weigh
        Dense(3, activation="softmax")
    ])
    return(model)
```

Instantiate, compile and train the model

```
In [61]: # Instantiate the model, using a dropout rate of 0.3 and weight decay coefficient of

         reg_model = get_regularised_model(train_data[0].shape, 0.3, 0.001)

In [62]: # Compile the model

         compile_model(reg_model)

In [63]: # Train the model

         reg_history = train_model(reg_model, train_data, train_targets, epochs=800)
```

```
Train on 114 samples, validate on 21 samples
Epoch 1/800
114/114 - 2s - loss: 1.9643 - acc: 0.4211 - val_loss: 1.9885 - val_acc: 0.3810
Epoch 2/800
114/114 - 0s - loss: 1.9706 - acc: 0.3860 - val_loss: 1.9802 - val_acc: 0.3810
Epoch 3/800
114/114 - 0s - loss: 1.9658 - acc: 0.3772 - val_loss: 1.9718 - val_acc: 0.3810
Epoch 4/800
114/114 - 0s - loss: 1.9821 - acc: 0.3772 - val_loss: 1.9635 - val_acc: 0.3810
```

```
Epoch 5/800
114/114 - 0s - loss: 1.9309 - acc: 0.4561 - val_loss: 1.9527 - val_acc: 0.3810
Epoch 6/800
114/114 - 0s - loss: 1.9421 - acc: 0.3947 - val_loss: 1.9420 - val_acc: 0.3810
Epoch 7/800
114/114 - 0s - loss: 1.9152 - acc: 0.4737 - val_loss: 1.9329 - val_acc: 0.6190
Epoch 8/800
114/114 - 0s - loss: 1.9321 - acc: 0.3860 - val_loss: 1.9236 - val_acc: 0.5238
Epoch 9/800
114/114 - 0s - loss: 1.8646 - acc: 0.5088 - val_loss: 1.9156 - val_acc: 0.4762
Epoch 10/800
114/114 - 0s - loss: 1.8898 - acc: 0.5526 - val_loss: 1.9089 - val_acc: 0.4286
Epoch 11/800
114/114 - 0s - loss: 1.8839 - acc: 0.5263 - val_loss: 1.9020 - val_acc: 0.4286
Epoch 12/800
114/114 - 0s - loss: 1.8538 - acc: 0.5439 - val_loss: 1.8935 - val_acc: 0.4286
Epoch 13/800
114/114 - 0s - loss: 1.8725 - acc: 0.5088 - val_loss: 1.8851 - val_acc: 0.4762
Epoch 14/800
114/114 - 0s - loss: 1.8035 - acc: 0.6491 - val_loss: 1.8759 - val_acc: 0.4762
Epoch 15/800
114/114 - 0s - loss: 1.7698 - acc: 0.6842 - val_loss: 1.8662 - val_acc: 0.4286
Epoch 16/800
114/114 - 0s - loss: 1.7596 - acc: 0.6579 - val_loss: 1.8562 - val_acc: 0.4286
Epoch 17/800
114/114 - 0s - loss: 1.7715 - acc: 0.5965 - val_loss: 1.8450 - val_acc: 0.4286
Epoch 18/800
114/114 - 0s - loss: 1.7582 - acc: 0.6316 - val_loss: 1.8332 - val_acc: 0.4762
Epoch 19/800
114/114 - 0s - loss: 1.8016 - acc: 0.4825 - val_loss: 1.8197 - val_acc: 0.5238
Epoch 20/800
114/114 - 0s - loss: 1.7059 - acc: 0.6667 - val_loss: 1.8092 - val_acc: 0.5714
Epoch 21/800
114/114 - 0s - loss: 1.7352 - acc: 0.6053 - val_loss: 1.7993 - val_acc: 0.6190
Epoch 22/800
114/114 - 0s - loss: 1.6921 - acc: 0.6930 - val_loss: 1.7882 - val_acc: 0.6190
Epoch 23/800
114/114 - 0s - loss: 1.6819 - acc: 0.6667 - val_loss: 1.7753 - val_acc: 0.6667
Epoch 24/800
114/114 - 0s - loss: 1.6725 - acc: 0.6404 - val_loss: 1.7619 - val_acc: 0.6667
Epoch 25/800
114/114 - 0s - loss: 1.6756 - acc: 0.6754 - val_loss: 1.7497 - val_acc: 0.6667
Epoch 26/800
114/114 - 0s - loss: 1.6569 - acc: 0.6491 - val_loss: 1.7354 - val_acc: 0.6190
Epoch 27/800
114/114 - 0s - loss: 1.6225 - acc: 0.6842 - val_loss: 1.7201 - val_acc: 0.6667
Epoch 28/800
114/114 - 0s - loss: 1.5944 - acc: 0.7105 - val_loss: 1.7051 - val_acc: 0.6190
```

```
Epoch 29/800
114/114 - 0s - loss: 1.5838 - acc: 0.5965 - val_loss: 1.6904 - val_acc: 0.6190
Epoch 30/800
114/114 - 0s - loss: 1.5625 - acc: 0.7105 - val_loss: 1.6745 - val_acc: 0.6190
Epoch 31/800
114/114 - 0s - loss: 1.5561 - acc: 0.6667 - val_loss: 1.6579 - val_acc: 0.6190
Epoch 32/800
114/114 - 0s - loss: 1.5660 - acc: 0.6228 - val_loss: 1.6409 - val_acc: 0.6190
Epoch 33/800
114/114 - 0s - loss: 1.5142 - acc: 0.6930 - val_loss: 1.6242 - val_acc: 0.6190
Epoch 34/800
114/114 - 0s - loss: 1.4841 - acc: 0.7281 - val_loss: 1.6080 - val_acc: 0.6190
Epoch 35/800
114/114 - 0s - loss: 1.5648 - acc: 0.6053 - val_loss: 1.5912 - val_acc: 0.6190
Epoch 36/800
114/114 - 0s - loss: 1.5053 - acc: 0.6404 - val_loss: 1.5758 - val_acc: 0.6190
Epoch 37/800
114/114 - 0s - loss: 1.4987 - acc: 0.6930 - val_loss: 1.5615 - val_acc: 0.6190
Epoch 38/800
114/114 - 0s - loss: 1.5056 - acc: 0.7368 - val_loss: 1.5471 - val_acc: 0.6190
Epoch 39/800
114/114 - 0s - loss: 1.4725 - acc: 0.6579 - val_loss: 1.5334 - val_acc: 0.6190
Epoch 40/800
114/114 - 0s - loss: 1.4397 - acc: 0.6754 - val_loss: 1.5194 - val_acc: 0.6190
Epoch 41/800
114/114 - 0s - loss: 1.4121 - acc: 0.7544 - val_loss: 1.5054 - val_acc: 0.6190
Epoch 42/800
114/114 - 0s - loss: 1.4354 - acc: 0.7018 - val_loss: 1.4912 - val_acc: 0.6190
Epoch 43/800
114/114 - 0s - loss: 1.4338 - acc: 0.6316 - val_loss: 1.4776 - val_acc: 0.6190
Epoch 44/800
114/114 - 0s - loss: 1.4377 - acc: 0.6316 - val_loss: 1.4651 - val_acc: 0.6190
Epoch 45/800
114/114 - 0s - loss: 1.3812 - acc: 0.7018 - val_loss: 1.4532 - val_acc: 0.6190
Epoch 46/800
114/114 - 0s - loss: 1.3860 - acc: 0.6667 - val_loss: 1.4428 - val_acc: 0.6190
Epoch 47/800
114/114 - 0s - loss: 1.3653 - acc: 0.7105 - val_loss: 1.4338 - val_acc: 0.6190
Epoch 48/800
114/114 - 0s - loss: 1.3442 - acc: 0.7544 - val_loss: 1.4246 - val_acc: 0.6190
Epoch 49/800
114/114 - 0s - loss: 1.3798 - acc: 0.7105 - val_loss: 1.4163 - val_acc: 0.6190
Epoch 50/800
114/114 - 0s - loss: 1.3567 - acc: 0.6754 - val_loss: 1.4091 - val_acc: 0.6190
Epoch 51/800
114/114 - 0s - loss: 1.3758 - acc: 0.7018 - val_loss: 1.4026 - val_acc: 0.6190
Epoch 52/800
114/114 - 0s - loss: 1.3434 - acc: 0.6930 - val_loss: 1.3969 - val_acc: 0.6190
```

```
Epoch 53/800
114/114 - 0s - loss: 1.3128 - acc: 0.7018 - val_loss: 1.3917 - val_acc: 0.6190
Epoch 54/800
114/114 - 0s - loss: 1.3140 - acc: 0.7456 - val_loss: 1.3865 - val_acc: 0.6667
Epoch 55/800
114/114 - 0s - loss: 1.3136 - acc: 0.7105 - val_loss: 1.3805 - val_acc: 0.6667
Epoch 56/800
114/114 - 0s - loss: 1.3370 - acc: 0.7105 - val_loss: 1.3754 - val_acc: 0.6667
Epoch 57/800
114/114 - 0s - loss: 1.3195 - acc: 0.6930 - val_loss: 1.3707 - val_acc: 0.6667
Epoch 58/800
114/114 - 0s - loss: 1.2966 - acc: 0.7105 - val_loss: 1.3650 - val_acc: 0.6667
Epoch 59/800
114/114 - 0s - loss: 1.3149 - acc: 0.6930 - val_loss: 1.3582 - val_acc: 0.6667
Epoch 60/800
114/114 - 0s - loss: 1.2924 - acc: 0.7018 - val_loss: 1.3524 - val_acc: 0.6667
Epoch 61/800
114/114 - 0s - loss: 1.3063 - acc: 0.7193 - val_loss: 1.3472 - val_acc: 0.6667
Epoch 62/800
114/114 - 0s - loss: 1.3091 - acc: 0.7193 - val_loss: 1.3422 - val_acc: 0.6667
Epoch 63/800
114/114 - 0s - loss: 1.2759 - acc: 0.7281 - val_loss: 1.3376 - val_acc: 0.7143
Epoch 64/800
114/114 - 0s - loss: 1.3046 - acc: 0.7018 - val_loss: 1.3349 - val_acc: 0.7143
Epoch 65/800
114/114 - 0s - loss: 1.2826 - acc: 0.7368 - val_loss: 1.3316 - val_acc: 0.7143
Epoch 66/800
114/114 - 0s - loss: 1.2718 - acc: 0.7105 - val_loss: 1.3276 - val_acc: 0.7143
Epoch 67/800
114/114 - 0s - loss: 1.2663 - acc: 0.7105 - val_loss: 1.3243 - val_acc: 0.7143
Epoch 68/800
114/114 - 0s - loss: 1.2963 - acc: 0.7281 - val_loss: 1.3191 - val_acc: 0.7143
Epoch 69/800
114/114 - 0s - loss: 1.2662 - acc: 0.6930 - val_loss: 1.3143 - val_acc: 0.7143
Epoch 70/800
114/114 - 0s - loss: 1.2787 - acc: 0.7281 - val_loss: 1.3101 - val_acc: 0.7143
Epoch 71/800
114/114 - 0s - loss: 1.2910 - acc: 0.7105 - val_loss: 1.3061 - val_acc: 0.7143
Epoch 72/800
114/114 - 0s - loss: 1.2763 - acc: 0.7018 - val_loss: 1.3037 - val_acc: 0.7143
Epoch 73/800
114/114 - 0s - loss: 1.2476 - acc: 0.7193 - val_loss: 1.3015 - val_acc: 0.7143
Epoch 74/800
114/114 - 0s - loss: 1.2515 - acc: 0.7281 - val_loss: 1.2994 - val_acc: 0.7143
Epoch 75/800
114/114 - 0s - loss: 1.2314 - acc: 0.7368 - val_loss: 1.2967 - val_acc: 0.7143
Epoch 76/800
114/114 - 0s - loss: 1.2417 - acc: 0.7281 - val_loss: 1.2948 - val_acc: 0.7619
```

```
Epoch 77/800
114/114 - 0s - loss: 1.2809 - acc: 0.6842 - val_loss: 1.2932 - val_acc: 0.7619
Epoch 78/800
114/114 - 0s - loss: 1.2387 - acc: 0.7456 - val_loss: 1.2897 - val_acc: 0.7619
Epoch 79/800
114/114 - 0s - loss: 1.2222 - acc: 0.7807 - val_loss: 1.2859 - val_acc: 0.7619
Epoch 80/800
114/114 - 0s - loss: 1.2295 - acc: 0.7456 - val_loss: 1.2830 - val_acc: 0.7619
Epoch 81/800
114/114 - 0s - loss: 1.2134 - acc: 0.7456 - val_loss: 1.2816 - val_acc: 0.7619
Epoch 82/800
114/114 - 0s - loss: 1.2678 - acc: 0.7281 - val_loss: 1.2809 - val_acc: 0.7619
Epoch 83/800
114/114 - 0s - loss: 1.2329 - acc: 0.7895 - val_loss: 1.2813 - val_acc: 0.7143
Epoch 84/800
114/114 - 0s - loss: 1.2458 - acc: 0.7632 - val_loss: 1.2811 - val_acc: 0.7143
Epoch 85/800
114/114 - 0s - loss: 1.2450 - acc: 0.7281 - val_loss: 1.2802 - val_acc: 0.7143
Epoch 86/800
114/114 - 0s - loss: 1.2304 - acc: 0.7456 - val_loss: 1.2809 - val_acc: 0.7143
Epoch 87/800
114/114 - 0s - loss: 1.2024 - acc: 0.7456 - val_loss: 1.2810 - val_acc: 0.7143
Epoch 88/800
114/114 - 0s - loss: 1.2258 - acc: 0.7632 - val_loss: 1.2810 - val_acc: 0.7619
Epoch 89/800
114/114 - 0s - loss: 1.2029 - acc: 0.7807 - val_loss: 1.2788 - val_acc: 0.7619
Epoch 90/800
114/114 - 0s - loss: 1.2311 - acc: 0.7368 - val_loss: 1.2767 - val_acc: 0.7619
Epoch 91/800
114/114 - 0s - loss: 1.2164 - acc: 0.8070 - val_loss: 1.2754 - val_acc: 0.8095
Epoch 92/800
114/114 - 0s - loss: 1.2016 - acc: 0.7895 - val_loss: 1.2727 - val_acc: 0.8095
Epoch 93/800
114/114 - 0s - loss: 1.1979 - acc: 0.8158 - val_loss: 1.2689 - val_acc: 0.8095
Epoch 94/800
114/114 - 0s - loss: 1.1862 - acc: 0.7632 - val_loss: 1.2650 - val_acc: 0.8095
Epoch 95/800
114/114 - 0s - loss: 1.1743 - acc: 0.8158 - val_loss: 1.2618 - val_acc: 0.8095
Epoch 96/800
114/114 - 0s - loss: 1.1846 - acc: 0.7895 - val_loss: 1.2583 - val_acc: 0.8095
Epoch 97/800
114/114 - 0s - loss: 1.1644 - acc: 0.7982 - val_loss: 1.2537 - val_acc: 0.8095
Epoch 98/800
114/114 - 0s - loss: 1.1682 - acc: 0.7982 - val_loss: 1.2499 - val_acc: 0.8095
Epoch 99/800
114/114 - 0s - loss: 1.1677 - acc: 0.8246 - val_loss: 1.2466 - val_acc: 0.8095
Epoch 100/800
114/114 - 0s - loss: 1.1931 - acc: 0.7456 - val_loss: 1.2451 - val_acc: 0.8095
```

```
Epoch 101/800
114/114 - 0s - loss: 1.1573 - acc: 0.8246 - val_loss: 1.2438 - val_acc: 0.8095
Epoch 102/800
114/114 - 0s - loss: 1.1703 - acc: 0.7895 - val_loss: 1.2433 - val_acc: 0.8571
Epoch 103/800
114/114 - 0s - loss: 1.1489 - acc: 0.8684 - val_loss: 1.2408 - val_acc: 0.8571
Epoch 104/800
114/114 - 0s - loss: 1.1509 - acc: 0.8070 - val_loss: 1.2362 - val_acc: 0.8571
Epoch 105/800
114/114 - 0s - loss: 1.1494 - acc: 0.8246 - val_loss: 1.2341 - val_acc: 0.8571
Epoch 106/800
114/114 - 0s - loss: 1.1471 - acc: 0.8333 - val_loss: 1.2335 - val_acc: 0.8571
Epoch 107/800
114/114 - 0s - loss: 1.1493 - acc: 0.7807 - val_loss: 1.2348 - val_acc: 0.8571
Epoch 108/800
114/114 - 0s - loss: 1.1638 - acc: 0.8070 - val_loss: 1.2343 - val_acc: 0.8571
Epoch 109/800
114/114 - 0s - loss: 1.1277 - acc: 0.8596 - val_loss: 1.2334 - val_acc: 0.8571
Epoch 110/800
114/114 - 0s - loss: 1.1335 - acc: 0.8421 - val_loss: 1.2340 - val_acc: 0.8095
Epoch 111/800
114/114 - 0s - loss: 1.1256 - acc: 0.8333 - val_loss: 1.2344 - val_acc: 0.8571
Epoch 112/800
114/114 - 0s - loss: 1.1157 - acc: 0.8596 - val_loss: 1.2340 - val_acc: 0.8571
Epoch 113/800
114/114 - 0s - loss: 1.1193 - acc: 0.8333 - val_loss: 1.2288 - val_acc: 0.8571
Epoch 114/800
114/114 - 0s - loss: 1.1039 - acc: 0.8684 - val_loss: 1.2247 - val_acc: 0.8571
Epoch 115/800
114/114 - 0s - loss: 1.1073 - acc: 0.8421 - val_loss: 1.2170 - val_acc: 0.8571
Epoch 116/800
114/114 - 0s - loss: 1.1267 - acc: 0.8070 - val_loss: 1.2088 - val_acc: 0.8571
Epoch 117/800
114/114 - 0s - loss: 1.0941 - acc: 0.8772 - val_loss: 1.2079 - val_acc: 0.8571
Epoch 118/800
114/114 - 0s - loss: 1.0849 - acc: 0.9035 - val_loss: 1.2071 - val_acc: 0.8571
Epoch 119/800
114/114 - 0s - loss: 1.0814 - acc: 0.8684 - val_loss: 1.2067 - val_acc: 0.8571
Epoch 120/800
114/114 - 0s - loss: 1.0862 - acc: 0.8684 - val_loss: 1.1908 - val_acc: 0.8571
Epoch 121/800
114/114 - 0s - loss: 1.0749 - acc: 0.9123 - val_loss: 1.1747 - val_acc: 0.8571
Epoch 122/800
114/114 - 0s - loss: 1.1321 - acc: 0.8421 - val_loss: 1.1571 - val_acc: 0.9048
Epoch 123/800
114/114 - 0s - loss: 1.0513 - acc: 0.8860 - val_loss: 1.1446 - val_acc: 0.9048
Epoch 124/800
114/114 - 0s - loss: 1.0916 - acc: 0.8596 - val_loss: 1.1468 - val_acc: 0.8571
```

```
Epoch 125/800
114/114 - 0s - loss: 1.0393 - acc: 0.9123 - val_loss: 1.1497 - val_acc: 0.8571
Epoch 126/800
114/114 - 0s - loss: 1.0070 - acc: 0.9474 - val_loss: 1.1492 - val_acc: 0.8571
Epoch 127/800
114/114 - 0s - loss: 1.0330 - acc: 0.9211 - val_loss: 1.1398 - val_acc: 0.8095
Epoch 128/800
114/114 - 0s - loss: 1.0308 - acc: 0.9123 - val_loss: 1.1316 - val_acc: 0.8095
Epoch 129/800
114/114 - 0s - loss: 1.0308 - acc: 0.9123 - val_loss: 1.1304 - val_acc: 0.8095
Epoch 130/800
114/114 - 0s - loss: 1.0067 - acc: 0.9386 - val_loss: 1.1342 - val_acc: 0.8095
Epoch 131/800
114/114 - 0s - loss: 1.0206 - acc: 0.8947 - val_loss: 1.1546 - val_acc: 0.8095
Epoch 132/800
114/114 - 0s - loss: 0.9671 - acc: 0.9386 - val_loss: 1.1535 - val_acc: 0.8095
Epoch 133/800
114/114 - 0s - loss: 0.9703 - acc: 0.9298 - val_loss: 1.1583 - val_acc: 0.8095
Epoch 134/800
114/114 - 0s - loss: 1.0097 - acc: 0.8947 - val_loss: 1.1385 - val_acc: 0.8095
Epoch 135/800
114/114 - 0s - loss: 0.9962 - acc: 0.9298 - val_loss: 1.1275 - val_acc: 0.8095
Epoch 136/800
114/114 - 0s - loss: 0.9568 - acc: 0.9649 - val_loss: 1.1298 - val_acc: 0.8095
Epoch 137/800
114/114 - 0s - loss: 1.0753 - acc: 0.8509 - val_loss: 1.1456 - val_acc: 0.8571
Epoch 138/800
114/114 - 0s - loss: 0.9672 - acc: 0.9211 - val_loss: 1.1429 - val_acc: 0.8095
Epoch 139/800
114/114 - 0s - loss: 0.9639 - acc: 0.9123 - val_loss: 1.1249 - val_acc: 0.8095
Epoch 140/800
114/114 - 0s - loss: 0.9893 - acc: 0.8860 - val_loss: 1.0939 - val_acc: 0.8095
Epoch 141/800
114/114 - 0s - loss: 0.9430 - acc: 0.9474 - val_loss: 1.0745 - val_acc: 0.8095
Epoch 142/800
114/114 - 0s - loss: 0.9285 - acc: 0.9474 - val_loss: 1.0690 - val_acc: 0.8095
Epoch 143/800
114/114 - 0s - loss: 0.8952 - acc: 0.9561 - val_loss: 1.0662 - val_acc: 0.8571
Epoch 144/800
114/114 - 0s - loss: 0.9257 - acc: 0.9386 - val_loss: 1.0648 - val_acc: 0.8571
Epoch 145/800
114/114 - 0s - loss: 0.9066 - acc: 0.9386 - val_loss: 1.0620 - val_acc: 0.8571
Epoch 146/800
114/114 - 0s - loss: 0.9408 - acc: 0.9211 - val_loss: 1.0619 - val_acc: 0.8571
Epoch 147/800
114/114 - 0s - loss: 0.9184 - acc: 0.9298 - val_loss: 1.0581 - val_acc: 0.8571
Epoch 148/800
114/114 - 0s - loss: 0.9232 - acc: 0.9474 - val_loss: 1.0710 - val_acc: 0.8571
```

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Epoch 149/800
114/114 - 0s - loss: 0.9166 - acc: 0.9298 - val_loss: 1.0654 - val_acc: 0.8571
Epoch 150/800
114/114 - 0s - loss: 0.9022 - acc: 0.9211 - val_loss: 1.0524 - val_acc: 0.8571
Epoch 151/800
114/114 - 0s - loss: 0.8635 - acc: 0.9825 - val_loss: 1.0441 - val_acc: 0.8571
Epoch 152/800
114/114 - 0s - loss: 0.8707 - acc: 0.9211 - val_loss: 1.0259 - val_acc: 0.8571
Epoch 153/800
114/114 - 0s - loss: 0.8472 - acc: 0.9649 - val_loss: 1.0097 - val_acc: 0.8571
Epoch 154/800
114/114 - 0s - loss: 0.8403 - acc: 0.9561 - val_loss: 0.9997 - val_acc: 0.8571
Epoch 155/800
114/114 - 0s - loss: 0.8048 - acc: 0.9825 - val_loss: 0.9954 - val_acc: 0.8571
Epoch 156/800
114/114 - 0s - loss: 0.8340 - acc: 0.9649 - val_loss: 0.9950 - val_acc: 0.8571
Epoch 157/800
114/114 - 0s - loss: 0.8282 - acc: 0.9737 - val_loss: 0.9900 - val_acc: 0.8571
Epoch 158/800
114/114 - 0s - loss: 0.8778 - acc: 0.9474 - val_loss: 0.9802 - val_acc: 0.8571
Epoch 159/800
114/114 - 0s - loss: 0.8199 - acc: 0.9649 - val_loss: 0.9904 - val_acc: 0.8571
Epoch 160/800
114/114 - 0s - loss: 0.8318 - acc: 0.9649 - val_loss: 1.0209 - val_acc: 0.8571
Epoch 161/800
114/114 - 0s - loss: 0.8338 - acc: 0.9737 - val_loss: 1.0219 - val_acc: 0.9048
Epoch 162/800
114/114 - 0s - loss: 0.8052 - acc: 0.9825 - val_loss: 0.9929 - val_acc: 0.8571
Epoch 163/800
114/114 - 0s - loss: 0.8239 - acc: 0.9649 - val_loss: 0.9685 - val_acc: 0.8571
Epoch 164/800
114/114 - 0s - loss: 0.8954 - acc: 0.9474 - val_loss: 0.9615 - val_acc: 0.8571
Epoch 165/800
114/114 - 0s - loss: 0.8174 - acc: 0.9561 - val_loss: 0.9531 - val_acc: 0.9048
Epoch 166/800
114/114 - 0s - loss: 0.8234 - acc: 0.9737 - val_loss: 0.9542 - val_acc: 0.9048
Epoch 167/800
114/114 - 0s - loss: 0.8396 - acc: 0.9561 - val_loss: 0.9535 - val_acc: 0.9048
Epoch 168/800
114/114 - 0s - loss: 0.7869 - acc: 0.9825 - val_loss: 0.9613 - val_acc: 0.9048
Epoch 169/800
114/114 - 0s - loss: 0.7894 - acc: 0.9912 - val_loss: 0.9706 - val_acc: 0.9524
Epoch 170/800
114/114 - 0s - loss: 0.8249 - acc: 0.9474 - val_loss: 0.9744 - val_acc: 0.9524
Epoch 171/800
114/114 - 0s - loss: 0.7786 - acc: 0.9737 - val_loss: 0.9597 - val_acc: 0.9524
Epoch 172/800
114/114 - 0s - loss: 0.7912 - acc: 0.9912 - val_loss: 0.9225 - val_acc: 0.9524
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Epoch 173/800
114/114 - 0s - loss: 0.7884 - acc: 0.9825 - val_loss: 0.9116 - val_acc: 0.9048
Epoch 174/800
114/114 - 0s - loss: 0.7909 - acc: 0.9737 - val_loss: 0.9063 - val_acc: 0.9048
Epoch 175/800
114/114 - 0s - loss: 0.8222 - acc: 0.9561 - val_loss: 0.9057 - val_acc: 0.9048
Epoch 176/800
114/114 - 0s - loss: 0.7996 - acc: 0.9649 - val_loss: 0.9143 - val_acc: 0.9048
Epoch 177/800
114/114 - 0s - loss: 0.8053 - acc: 0.9561 - val_loss: 0.9220 - val_acc: 0.9524
Epoch 178/800
114/114 - 0s - loss: 0.8408 - acc: 0.9474 - val_loss: 0.9459 - val_acc: 0.9524
Epoch 179/800
114/114 - 0s - loss: 0.7892 - acc: 0.9737 - val_loss: 0.9501 - val_acc: 0.9524
Epoch 180/800
114/114 - 0s - loss: 0.8110 - acc: 0.9561 - val_loss: 0.9255 - val_acc: 0.9524
Epoch 181/800
114/114 - 0s - loss: 0.7885 - acc: 0.9561 - val_loss: 0.9124 - val_acc: 0.9048
Epoch 182/800
114/114 - 0s - loss: 0.7730 - acc: 0.9825 - val_loss: 0.9071 - val_acc: 0.9048
Epoch 183/800
114/114 - 0s - loss: 0.7956 - acc: 0.9825 - val_loss: 0.9046 - val_acc: 0.9048
Epoch 184/800
114/114 - 0s - loss: 0.7561 - acc: 1.0000 - val_loss: 0.9040 - val_acc: 0.9048
Epoch 185/800
114/114 - 0s - loss: 0.7831 - acc: 0.9737 - val_loss: 0.9030 - val_acc: 0.9048
Epoch 186/800
114/114 - 0s - loss: 0.8209 - acc: 0.9825 - val_loss: 0.9090 - val_acc: 0.9048
Epoch 187/800
114/114 - 0s - loss: 0.7539 - acc: 0.9912 - val_loss: 0.9132 - val_acc: 0.9048
Epoch 188/800
114/114 - 0s - loss: 0.8291 - acc: 0.9386 - val_loss: 0.9199 - val_acc: 0.9048
Epoch 189/800
114/114 - 0s - loss: 0.8555 - acc: 0.9474 - val_loss: 0.9112 - val_acc: 0.9048
Epoch 190/800
114/114 - 0s - loss: 0.7917 - acc: 0.9649 - val_loss: 0.9114 - val_acc: 0.9048
Epoch 191/800
114/114 - 0s - loss: 0.7561 - acc: 0.9912 - val_loss: 0.9117 - val_acc: 0.9048
Epoch 192/800
114/114 - 0s - loss: 0.7451 - acc: 1.0000 - val_loss: 0.9122 - val_acc: 0.9048
Epoch 193/800
114/114 - 0s - loss: 0.7458 - acc: 0.9912 - val_loss: 0.9109 - val_acc: 0.9048
Epoch 194/800
114/114 - 0s - loss: 0.7559 - acc: 0.9912 - val_loss: 0.9119 - val_acc: 0.9048
Epoch 195/800
114/114 - 0s - loss: 0.7973 - acc: 0.9649 - val_loss: 0.9106 - val_acc: 0.9048
Epoch 196/800
114/114 - 0s - loss: 0.7617 - acc: 0.9825 - val_loss: 0.9106 - val_acc: 0.9048
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Epoch 197/800
114/114 - 0s - loss: 0.7823 - acc: 0.9561 - val_loss: 0.9084 - val_acc: 0.9048
Epoch 198/800
114/114 - 0s - loss: 0.7610 - acc: 0.9912 - val_loss: 0.9056 - val_acc: 0.9048
Epoch 199/800
114/114 - 0s - loss: 0.7344 - acc: 0.9912 - val_loss: 0.9040 - val_acc: 0.9048
Epoch 200/800
114/114 - 0s - loss: 0.7629 - acc: 0.9649 - val_loss: 0.9016 - val_acc: 0.9048
Epoch 201/800
114/114 - 0s - loss: 0.7452 - acc: 0.9912 - val_loss: 0.9006 - val_acc: 0.9048
Epoch 202/800
114/114 - 0s - loss: 0.7624 - acc: 0.9737 - val_loss: 0.8998 - val_acc: 0.9048
Epoch 203/800
114/114 - 0s - loss: 0.7761 - acc: 0.9561 - val_loss: 0.8999 - val_acc: 0.9048
Epoch 204/800
114/114 - 0s - loss: 0.7518 - acc: 0.9825 - val_loss: 0.9034 - val_acc: 0.9048
Epoch 205/800
114/114 - 0s - loss: 0.7968 - acc: 0.9649 - val_loss: 0.9002 - val_acc: 0.9048
Epoch 206/800
114/114 - 0s - loss: 0.7442 - acc: 0.9912 - val_loss: 0.9015 - val_acc: 0.9048
Epoch 207/800
114/114 - 0s - loss: 0.7333 - acc: 0.9912 - val_loss: 0.9044 - val_acc: 0.9048
Epoch 208/800
114/114 - 0s - loss: 0.7706 - acc: 0.9737 - val_loss: 0.9067 - val_acc: 0.9048
Epoch 209/800
114/114 - 0s - loss: 0.7167 - acc: 0.9912 - val_loss: 0.9084 - val_acc: 0.9048
Epoch 210/800
114/114 - 0s - loss: 0.7639 - acc: 0.9561 - val_loss: 0.9090 - val_acc: 0.9048
Epoch 211/800
114/114 - 0s - loss: 0.7427 - acc: 0.9825 - val_loss: 0.9102 - val_acc: 0.9048
Epoch 212/800
114/114 - 0s - loss: 0.7127 - acc: 1.0000 - val_loss: 0.9125 - val_acc: 0.9048
Epoch 213/800
114/114 - 0s - loss: 0.7247 - acc: 0.9912 - val_loss: 0.9161 - val_acc: 0.9048
Epoch 214/800
114/114 - 0s - loss: 0.7488 - acc: 0.9825 - val_loss: 0.9223 - val_acc: 0.9048
Epoch 215/800
114/114 - 0s - loss: 0.7444 - acc: 0.9825 - val_loss: 0.9205 - val_acc: 0.9048
Epoch 216/800
114/114 - 0s - loss: 0.7711 - acc: 0.9561 - val_loss: 0.9218 - val_acc: 0.9048
Epoch 217/800
114/114 - 0s - loss: 0.7444 - acc: 0.9825 - val_loss: 0.9239 - val_acc: 0.9048
Epoch 218/800
114/114 - 0s - loss: 0.7652 - acc: 0.9649 - val_loss: 0.9291 - val_acc: 0.9048
Epoch 219/800
114/114 - 0s - loss: 0.7593 - acc: 0.9825 - val_loss: 0.9206 - val_acc: 0.9048
Epoch 220/800
114/114 - 0s - loss: 0.7946 - acc: 0.9649 - val_loss: 0.9169 - val_acc: 0.9048
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Epoch 221/800
114/114 - 0s - loss: 0.7405 - acc: 0.9561 - val_loss: 0.9228 - val_acc: 0.9048
Epoch 222/800
114/114 - 0s - loss: 0.7442 - acc: 0.9649 - val_loss: 0.9211 - val_acc: 0.9048
Epoch 223/800
114/114 - 0s - loss: 0.7810 - acc: 0.9649 - val_loss: 0.9135 - val_acc: 0.9048
Epoch 224/800
114/114 - 0s - loss: 0.7298 - acc: 0.9825 - val_loss: 0.9110 - val_acc: 0.9048
Epoch 225/800
114/114 - 0s - loss: 0.7077 - acc: 0.9912 - val_loss: 0.9103 - val_acc: 0.9048
Epoch 226/800
114/114 - 0s - loss: 0.7656 - acc: 0.9912 - val_loss: 0.9064 - val_acc: 0.9048
Epoch 227/800
114/114 - 0s - loss: 0.8095 - acc: 0.9474 - val_loss: 0.9044 - val_acc: 0.9048
Epoch 228/800
114/114 - 0s - loss: 0.7472 - acc: 0.9825 - val_loss: 0.9078 - val_acc: 0.9048
Epoch 229/800
114/114 - 0s - loss: 0.7320 - acc: 0.9737 - val_loss: 0.9112 - val_acc: 0.9048
Epoch 230/800
114/114 - 0s - loss: 0.7062 - acc: 0.9912 - val_loss: 0.9117 - val_acc: 0.9048
Epoch 231/800
114/114 - 0s - loss: 0.7235 - acc: 0.9825 - val_loss: 0.9111 - val_acc: 0.9048
Epoch 232/800
114/114 - 0s - loss: 0.7734 - acc: 0.9474 - val_loss: 0.9113 - val_acc: 0.9048
Epoch 233/800
114/114 - 0s - loss: 0.7159 - acc: 0.9825 - val_loss: 0.9096 - val_acc: 0.9048
Epoch 234/800
114/114 - 0s - loss: 0.7139 - acc: 0.9912 - val_loss: 0.9058 - val_acc: 0.9048
Epoch 235/800
114/114 - 0s - loss: 0.7311 - acc: 0.9737 - val_loss: 0.9072 - val_acc: 0.9048
Epoch 236/800
114/114 - 0s - loss: 0.7412 - acc: 0.9737 - val_loss: 0.8930 - val_acc: 0.9048
Epoch 237/800
114/114 - 0s - loss: 0.7436 - acc: 0.9649 - val_loss: 0.8832 - val_acc: 0.9048
Epoch 238/800
114/114 - 0s - loss: 0.7362 - acc: 0.9825 - val_loss: 0.8896 - val_acc: 0.9048
Epoch 239/800
114/114 - 0s - loss: 0.7588 - acc: 0.9737 - val_loss: 0.9140 - val_acc: 0.9048
Epoch 240/800
114/114 - 0s - loss: 0.7294 - acc: 0.9737 - val_loss: 0.9203 - val_acc: 0.9048
Epoch 241/800
114/114 - 0s - loss: 0.7163 - acc: 0.9825 - val_loss: 0.9322 - val_acc: 0.9048
Epoch 242/800
114/114 - 0s - loss: 0.8216 - acc: 0.9298 - val_loss: 0.9300 - val_acc: 0.9048
Epoch 243/800
114/114 - 0s - loss: 0.7107 - acc: 0.9737 - val_loss: 0.9276 - val_acc: 0.9048
Epoch 244/800
114/114 - 0s - loss: 0.7091 - acc: 0.9912 - val_loss: 0.9267 - val_acc: 0.9048
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Epoch 245/800
114/114 - 0s - loss: 0.7388 - acc: 0.9649 - val_loss: 0.9291 - val_acc: 0.9048
Epoch 246/800
114/114 - 0s - loss: 0.7389 - acc: 0.9649 - val_loss: 0.9262 - val_acc: 0.9048
Epoch 247/800
114/114 - 0s - loss: 0.7397 - acc: 0.9649 - val_loss: 0.9136 - val_acc: 0.9048
Epoch 248/800
114/114 - 0s - loss: 0.7474 - acc: 0.9561 - val_loss: 0.9060 - val_acc: 0.9048
Epoch 249/800
114/114 - 0s - loss: 0.7408 - acc: 0.9649 - val_loss: 0.9043 - val_acc: 0.9048
Epoch 250/800
114/114 - 0s - loss: 0.7357 - acc: 0.9737 - val_loss: 0.8839 - val_acc: 0.9048
Epoch 251/800
114/114 - 0s - loss: 0.6891 - acc: 0.9912 - val_loss: 0.8775 - val_acc: 0.9048
Epoch 252/800
114/114 - 0s - loss: 0.7144 - acc: 0.9649 - val_loss: 0.8900 - val_acc: 0.9048
Epoch 253/800
114/114 - 0s - loss: 0.7284 - acc: 0.9737 - val_loss: 0.9298 - val_acc: 0.9048
Epoch 254/800
114/114 - 0s - loss: 0.7176 - acc: 0.9737 - val_loss: 0.9293 - val_acc: 0.9048
Epoch 255/800
114/114 - 0s - loss: 0.7176 - acc: 0.9649 - val_loss: 0.9145 - val_acc: 0.9048
Epoch 256/800
114/114 - 0s - loss: 0.7272 - acc: 0.9649 - val_loss: 0.9129 - val_acc: 0.9048
Epoch 257/800
114/114 - 0s - loss: 0.6814 - acc: 1.0000 - val_loss: 0.9108 - val_acc: 0.9048
Epoch 258/800
114/114 - 0s - loss: 0.6938 - acc: 0.9912 - val_loss: 0.9004 - val_acc: 0.9048
Epoch 259/800
114/114 - 0s - loss: 0.7134 - acc: 0.9737 - val_loss: 0.8970 - val_acc: 0.9048
Epoch 260/800
114/114 - 0s - loss: 0.7037 - acc: 0.9737 - val_loss: 0.8986 - val_acc: 0.9048
Epoch 261/800
114/114 - 0s - loss: 0.7155 - acc: 0.9912 - val_loss: 0.9013 - val_acc: 0.9048
Epoch 262/800
114/114 - 0s - loss: 0.6876 - acc: 0.9825 - val_loss: 0.9057 - val_acc: 0.9048
Epoch 263/800
114/114 - 0s - loss: 0.7171 - acc: 0.9825 - val_loss: 0.9095 - val_acc: 0.9048
Epoch 264/800
114/114 - 0s - loss: 0.7289 - acc: 0.9649 - val_loss: 0.9140 - val_acc: 0.9048
Epoch 265/800
114/114 - 0s - loss: 0.7521 - acc: 0.9649 - val_loss: 0.9148 - val_acc: 0.9048
Epoch 266/800
114/114 - 0s - loss: 0.6718 - acc: 1.0000 - val_loss: 0.9119 - val_acc: 0.9048
Epoch 267/800
114/114 - 0s - loss: 0.7320 - acc: 0.9737 - val_loss: 0.9136 - val_acc: 0.9048
Epoch 268/800
114/114 - 0s - loss: 0.7140 - acc: 0.9737 - val_loss: 0.9060 - val_acc: 0.9048
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Epoch 269/800
114/114 - 0s - loss: 0.6989 - acc: 0.9737 - val_loss: 0.8974 - val_acc: 0.9048
Epoch 270/800
114/114 - 0s - loss: 0.7101 - acc: 0.9737 - val_loss: 0.8916 - val_acc: 0.9048
Epoch 271/800
114/114 - 0s - loss: 0.6816 - acc: 0.9912 - val_loss: 0.8882 - val_acc: 0.9048
Epoch 272/800
114/114 - 0s - loss: 0.7856 - acc: 0.9561 - val_loss: 0.8886 - val_acc: 0.9048
Epoch 273/800
114/114 - 0s - loss: 0.7204 - acc: 0.9737 - val_loss: 0.9051 - val_acc: 0.9048
Epoch 274/800
114/114 - 0s - loss: 0.7606 - acc: 0.9649 - val_loss: 0.9151 - val_acc: 0.9048
Epoch 275/800
114/114 - 0s - loss: 0.7204 - acc: 0.9737 - val_loss: 0.9199 - val_acc: 0.9048
Epoch 276/800
114/114 - 0s - loss: 0.7524 - acc: 0.9561 - val_loss: 0.9162 - val_acc: 0.9048
Epoch 277/800
114/114 - 0s - loss: 0.6769 - acc: 0.9912 - val_loss: 0.9120 - val_acc: 0.9048
Epoch 278/800
114/114 - 0s - loss: 0.6860 - acc: 0.9825 - val_loss: 0.9113 - val_acc: 0.9048
Epoch 279/800
114/114 - 0s - loss: 0.6740 - acc: 0.9912 - val_loss: 0.9137 - val_acc: 0.9048
Epoch 280/800
114/114 - 0s - loss: 0.6809 - acc: 0.9912 - val_loss: 0.9203 - val_acc: 0.9048
Epoch 281/800
114/114 - 0s - loss: 0.7095 - acc: 0.9737 - val_loss: 0.9240 - val_acc: 0.9048
Epoch 282/800
114/114 - 0s - loss: 0.7145 - acc: 0.9649 - val_loss: 0.9078 - val_acc: 0.9048
Epoch 283/800
114/114 - 0s - loss: 0.7252 - acc: 0.9737 - val_loss: 0.8976 - val_acc: 0.9048
Epoch 284/800
114/114 - 0s - loss: 0.7733 - acc: 0.9649 - val_loss: 0.8929 - val_acc: 0.9048
Epoch 285/800
114/114 - 0s - loss: 0.6791 - acc: 0.9825 - val_loss: 0.9058 - val_acc: 0.9048
Epoch 286/800
114/114 - 0s - loss: 0.7033 - acc: 0.9737 - val_loss: 0.9223 - val_acc: 0.9048
Epoch 287/800
114/114 - 0s - loss: 0.7018 - acc: 0.9737 - val_loss: 0.9269 - val_acc: 0.9048
Epoch 288/800
114/114 - 0s - loss: 0.6675 - acc: 1.0000 - val_loss: 0.9273 - val_acc: 0.9048
Epoch 289/800
114/114 - 0s - loss: 0.6846 - acc: 0.9825 - val_loss: 0.9179 - val_acc: 0.9048
Epoch 290/800
114/114 - 0s - loss: 0.7098 - acc: 0.9737 - val_loss: 0.8837 - val_acc: 0.9048
Epoch 291/800
114/114 - 0s - loss: 0.7284 - acc: 0.9912 - val_loss: 0.8808 - val_acc: 0.9524
Epoch 292/800
114/114 - 0s - loss: 0.8158 - acc: 0.9649 - val_loss: 0.8893 - val_acc: 0.9524
```

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Epoch 293/800
114/114 - 0s - loss: 0.7056 - acc: 0.9825 - val_loss: 0.8813 - val_acc: 0.9048
Epoch 294/800
114/114 - 0s - loss: 0.7024 - acc: 0.9912 - val_loss: 0.9059 - val_acc: 0.9048
Epoch 295/800
114/114 - 0s - loss: 0.6888 - acc: 0.9912 - val_loss: 0.9303 - val_acc: 0.9048
Epoch 296/800
114/114 - 0s - loss: 0.6786 - acc: 0.9912 - val_loss: 0.9411 - val_acc: 0.9048
Epoch 297/800
114/114 - 0s - loss: 0.7090 - acc: 0.9825 - val_loss: 0.9406 - val_acc: 0.9048
Epoch 298/800
114/114 - 0s - loss: 0.7520 - acc: 0.9386 - val_loss: 0.9454 - val_acc: 0.9048
Epoch 299/800
114/114 - 0s - loss: 0.6832 - acc: 0.9737 - val_loss: 0.9246 - val_acc: 0.9048
Epoch 300/800
114/114 - 0s - loss: 0.6756 - acc: 0.9912 - val_loss: 0.8957 - val_acc: 0.9048
Epoch 301/800
114/114 - 0s - loss: 0.6677 - acc: 0.9912 - val_loss: 0.8720 - val_acc: 0.9048
Epoch 302/800
114/114 - 0s - loss: 0.6934 - acc: 0.9825 - val_loss: 0.8683 - val_acc: 0.9048
Epoch 303/800
114/114 - 0s - loss: 0.7030 - acc: 0.9737 - val_loss: 0.8820 - val_acc: 0.9048
Epoch 304/800
114/114 - 0s - loss: 0.6637 - acc: 0.9912 - val_loss: 0.9083 - val_acc: 0.9048
Epoch 305/800
114/114 - 0s - loss: 0.6779 - acc: 0.9912 - val_loss: 0.9191 - val_acc: 0.9048
Epoch 306/800
114/114 - 0s - loss: 0.6793 - acc: 0.9825 - val_loss: 0.9149 - val_acc: 0.9048
Epoch 307/800
114/114 - 0s - loss: 0.7193 - acc: 0.9649 - val_loss: 0.9123 - val_acc: 0.9048
Epoch 308/800
114/114 - 0s - loss: 0.7149 - acc: 0.9474 - val_loss: 0.9048 - val_acc: 0.9048
Epoch 309/800
114/114 - 0s - loss: 0.6697 - acc: 0.9825 - val_loss: 0.8779 - val_acc: 0.9048
Epoch 310/800
114/114 - 0s - loss: 0.7090 - acc: 0.9649 - val_loss: 0.8412 - val_acc: 0.9048
Epoch 311/800
114/114 - 0s - loss: 0.6822 - acc: 0.9825 - val_loss: 0.8450 - val_acc: 0.9048
Epoch 312/800
114/114 - 0s - loss: 0.6706 - acc: 0.9825 - val_loss: 0.8617 - val_acc: 0.9048
Epoch 313/800
114/114 - 0s - loss: 0.6820 - acc: 0.9825 - val_loss: 0.8779 - val_acc: 0.9048
Epoch 314/800
114/114 - 0s - loss: 0.6900 - acc: 0.9912 - val_loss: 0.8915 - val_acc: 0.9048
Epoch 315/800
114/114 - 0s - loss: 0.6708 - acc: 0.9912 - val_loss: 0.8962 - val_acc: 0.9048
Epoch 316/800
114/114 - 0s - loss: 0.6658 - acc: 0.9912 - val_loss: 0.9122 - val_acc: 0.9048
```

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Epoch 317/800
114/114 - 0s - loss: 0.6689 - acc: 0.9912 - val_loss: 0.9202 - val_acc: 0.9048
Epoch 318/800
114/114 - 0s - loss: 0.6691 - acc: 0.9912 - val_loss: 0.9222 - val_acc: 0.9048
Epoch 319/800
114/114 - 0s - loss: 0.7061 - acc: 0.9649 - val_loss: 0.9044 - val_acc: 0.9048
Epoch 320/800
114/114 - 0s - loss: 0.7177 - acc: 0.9737 - val_loss: 0.9000 - val_acc: 0.9048
Epoch 321/800
114/114 - 0s - loss: 0.6755 - acc: 0.9825 - val_loss: 0.8810 - val_acc: 0.9048
Epoch 322/800
114/114 - 0s - loss: 0.7681 - acc: 0.9386 - val_loss: 0.8494 - val_acc: 0.9048
Epoch 323/800
114/114 - 0s - loss: 0.6622 - acc: 0.9737 - val_loss: 0.8450 - val_acc: 0.9048
Epoch 324/800
114/114 - 0s - loss: 0.6588 - acc: 0.9825 - val_loss: 0.8647 - val_acc: 0.9048
Epoch 325/800
114/114 - 0s - loss: 0.6888 - acc: 0.9825 - val_loss: 0.9029 - val_acc: 0.9048
Epoch 326/800
114/114 - 0s - loss: 0.6611 - acc: 0.9825 - val_loss: 0.9152 - val_acc: 0.9048
Epoch 327/800
114/114 - 0s - loss: 0.6627 - acc: 0.9825 - val_loss: 0.9141 - val_acc: 0.9048
Epoch 328/800
114/114 - 0s - loss: 0.6731 - acc: 0.9737 - val_loss: 0.9038 - val_acc: 0.9048
Epoch 329/800
114/114 - 0s - loss: 0.6805 - acc: 0.9912 - val_loss: 0.8714 - val_acc: 0.9048
Epoch 330/800
114/114 - 0s - loss: 0.6896 - acc: 0.9649 - val_loss: 0.8636 - val_acc: 0.9048
Epoch 331/800
114/114 - 0s - loss: 0.7484 - acc: 0.9649 - val_loss: 0.8799 - val_acc: 0.9048
Epoch 332/800
114/114 - 0s - loss: 0.6563 - acc: 0.9912 - val_loss: 0.8834 - val_acc: 0.9048
Epoch 333/800
114/114 - 0s - loss: 0.6479 - acc: 0.9912 - val_loss: 0.8864 - val_acc: 0.9048
Epoch 334/800
114/114 - 0s - loss: 0.6543 - acc: 1.0000 - val_loss: 0.8929 - val_acc: 0.9048
Epoch 335/800
114/114 - 0s - loss: 0.7003 - acc: 0.9737 - val_loss: 0.8947 - val_acc: 0.9048
Epoch 336/800
114/114 - 0s - loss: 0.7034 - acc: 0.9649 - val_loss: 0.9037 - val_acc: 0.9048
Epoch 337/800
114/114 - 0s - loss: 0.7092 - acc: 0.9561 - val_loss: 0.8976 - val_acc: 0.9048
Epoch 338/800
114/114 - 0s - loss: 0.7087 - acc: 0.9737 - val_loss: 0.8942 - val_acc: 0.9048
Epoch 339/800
114/114 - 0s - loss: 0.6647 - acc: 0.9737 - val_loss: 0.8938 - val_acc: 0.9048
Epoch 340/800
114/114 - 0s - loss: 0.6546 - acc: 0.9825 - val_loss: 0.9039 - val_acc: 0.9048
```

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Epoch 341/800
114/114 - 0s - loss: 0.6520 - acc: 0.9912 - val_loss: 0.9037 - val_acc: 0.9048
Epoch 342/800
114/114 - 0s - loss: 0.6474 - acc: 0.9825 - val_loss: 0.8995 - val_acc: 0.9048
Epoch 343/800
114/114 - 0s - loss: 0.6507 - acc: 1.0000 - val_loss: 0.8997 - val_acc: 0.9048
Epoch 344/800
114/114 - 0s - loss: 0.6377 - acc: 0.9912 - val_loss: 0.8990 - val_acc: 0.9048
Epoch 345/800
114/114 - 0s - loss: 0.6784 - acc: 0.9737 - val_loss: 0.8918 - val_acc: 0.9048
Epoch 346/800
114/114 - 0s - loss: 0.6521 - acc: 0.9912 - val_loss: 0.8829 - val_acc: 0.9048
Epoch 347/800
114/114 - 0s - loss: 0.6511 - acc: 0.9825 - val_loss: 0.8897 - val_acc: 0.9048
Epoch 348/800
114/114 - 0s - loss: 0.6503 - acc: 0.9912 - val_loss: 0.8964 - val_acc: 0.9048
Epoch 349/800
114/114 - 0s - loss: 0.6549 - acc: 0.9912 - val_loss: 0.9009 - val_acc: 0.9048
Epoch 350/800
114/114 - 0s - loss: 0.6869 - acc: 0.9737 - val_loss: 0.9021 - val_acc: 0.9048
Epoch 351/800
114/114 - 0s - loss: 0.6534 - acc: 0.9912 - val_loss: 0.8930 - val_acc: 0.9048
Epoch 352/800
114/114 - 0s - loss: 0.6826 - acc: 0.9737 - val_loss: 0.8896 - val_acc: 0.9048
Epoch 353/800
114/114 - 0s - loss: 0.7135 - acc: 0.9737 - val_loss: 0.8676 - val_acc: 0.9048
Epoch 354/800
114/114 - 0s - loss: 0.6465 - acc: 0.9825 - val_loss: 0.8735 - val_acc: 0.9048
Epoch 355/800
114/114 - 0s - loss: 0.6519 - acc: 0.9825 - val_loss: 0.8821 - val_acc: 0.9048
Epoch 356/800
114/114 - 0s - loss: 0.6453 - acc: 0.9912 - val_loss: 0.8985 - val_acc: 0.9048
Epoch 357/800
114/114 - 0s - loss: 0.6323 - acc: 1.0000 - val_loss: 0.9063 - val_acc: 0.9048
Epoch 358/800
114/114 - 0s - loss: 0.6781 - acc: 0.9737 - val_loss: 0.9040 - val_acc: 0.9048
Epoch 359/800
114/114 - 0s - loss: 0.6464 - acc: 0.9825 - val_loss: 0.8986 - val_acc: 0.9048
Epoch 360/800
114/114 - 0s - loss: 0.6675 - acc: 0.9825 - val_loss: 0.8963 - val_acc: 0.9048
Epoch 361/800
114/114 - 0s - loss: 0.6930 - acc: 0.9737 - val_loss: 0.8880 - val_acc: 0.9048
Epoch 362/800
114/114 - 0s - loss: 0.6448 - acc: 0.9912 - val_loss: 0.8761 - val_acc: 0.9048
Epoch 363/800
114/114 - 0s - loss: 0.6440 - acc: 0.9825 - val_loss: 0.8608 - val_acc: 0.9048
Epoch 364/800
114/114 - 0s - loss: 0.6403 - acc: 0.9825 - val_loss: 0.8419 - val_acc: 0.9048
```

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Epoch 365/800
114/114 - 0s - loss: 0.6448 - acc: 0.9825 - val_loss: 0.8523 - val_acc: 0.9048
Epoch 366/800
114/114 - 0s - loss: 0.6491 - acc: 0.9825 - val_loss: 0.8867 - val_acc: 0.9048
Epoch 367/800
114/114 - 0s - loss: 0.6580 - acc: 0.9825 - val_loss: 0.8936 - val_acc: 0.9048
Epoch 368/800
114/114 - 0s - loss: 0.6842 - acc: 0.9561 - val_loss: 0.9009 - val_acc: 0.9048
Epoch 369/800
114/114 - 0s - loss: 0.6348 - acc: 0.9912 - val_loss: 0.8895 - val_acc: 0.9048
Epoch 370/800
114/114 - 0s - loss: 0.6492 - acc: 0.9825 - val_loss: 0.8819 - val_acc: 0.9048
Epoch 371/800
114/114 - 0s - loss: 0.6286 - acc: 1.0000 - val_loss: 0.8678 - val_acc: 0.9048
Epoch 372/800
114/114 - 0s - loss: 0.6311 - acc: 0.9912 - val_loss: 0.8552 - val_acc: 0.9048
Epoch 373/800
114/114 - 0s - loss: 0.6516 - acc: 0.9737 - val_loss: 0.8784 - val_acc: 0.9048
Epoch 374/800
114/114 - 0s - loss: 0.6215 - acc: 0.9912 - val_loss: 0.9120 - val_acc: 0.9048
Epoch 375/800
114/114 - 0s - loss: 0.7040 - acc: 0.9561 - val_loss: 0.9238 - val_acc: 0.9048
Epoch 376/800
114/114 - 0s - loss: 0.6270 - acc: 1.0000 - val_loss: 0.9232 - val_acc: 0.9048
Epoch 377/800
114/114 - 0s - loss: 0.6350 - acc: 0.9912 - val_loss: 0.9131 - val_acc: 0.9048
Epoch 378/800
114/114 - 0s - loss: 0.6305 - acc: 1.0000 - val_loss: 0.9059 - val_acc: 0.9048
Epoch 379/800
114/114 - 0s - loss: 0.6682 - acc: 0.9825 - val_loss: 0.8929 - val_acc: 0.9048
Epoch 380/800
114/114 - 0s - loss: 0.6345 - acc: 0.9825 - val_loss: 0.8812 - val_acc: 0.9048
Epoch 381/800
114/114 - 0s - loss: 0.6342 - acc: 0.9912 - val_loss: 0.8604 - val_acc: 0.9048
Epoch 382/800
114/114 - 0s - loss: 0.6445 - acc: 0.9825 - val_loss: 0.8619 - val_acc: 0.9048
Epoch 383/800
114/114 - 0s - loss: 0.6580 - acc: 0.9825 - val_loss: 0.8958 - val_acc: 0.9048
Epoch 384/800
114/114 - 0s - loss: 0.6404 - acc: 0.9825 - val_loss: 0.8903 - val_acc: 0.9048
Epoch 385/800
114/114 - 0s - loss: 0.6479 - acc: 0.9649 - val_loss: 0.8922 - val_acc: 0.9524
Epoch 386/800
114/114 - 0s - loss: 0.6698 - acc: 0.9737 - val_loss: 0.8905 - val_acc: 0.9048
Epoch 387/800
114/114 - 0s - loss: 0.6177 - acc: 1.0000 - val_loss: 0.8862 - val_acc: 0.9048
Epoch 388/800
114/114 - 0s - loss: 0.6580 - acc: 0.9737 - val_loss: 0.8729 - val_acc: 0.9048
```

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Epoch 389/800
114/114 - 0s - loss: 0.6433 - acc: 0.9912 - val_loss: 0.8523 - val_acc: 0.9048
Epoch 390/800
114/114 - 0s - loss: 0.6429 - acc: 0.9737 - val_loss: 0.8622 - val_acc: 0.9048
Epoch 391/800
114/114 - 0s - loss: 0.6307 - acc: 0.9912 - val_loss: 0.8734 - val_acc: 0.9048
Epoch 392/800
114/114 - 0s - loss: 0.6228 - acc: 0.9912 - val_loss: 0.8832 - val_acc: 0.9048
Epoch 393/800
114/114 - 0s - loss: 0.6400 - acc: 0.9912 - val_loss: 0.8963 - val_acc: 0.9048
Epoch 394/800
114/114 - 0s - loss: 0.6587 - acc: 0.9912 - val_loss: 0.9138 - val_acc: 0.9048
Epoch 395/800
114/114 - 0s - loss: 0.6152 - acc: 1.0000 - val_loss: 0.9218 - val_acc: 0.9048
Epoch 396/800
114/114 - 0s - loss: 0.6304 - acc: 0.9825 - val_loss: 0.9229 - val_acc: 0.9048
Epoch 397/800
114/114 - 0s - loss: 0.6464 - acc: 0.9825 - val_loss: 0.9230 - val_acc: 0.9048
Epoch 398/800
114/114 - 0s - loss: 0.6304 - acc: 0.9825 - val_loss: 0.9149 - val_acc: 0.9048
Epoch 399/800
114/114 - 0s - loss: 0.6596 - acc: 0.9649 - val_loss: 0.9066 - val_acc: 0.9048
Epoch 400/800
114/114 - 0s - loss: 0.6517 - acc: 0.9737 - val_loss: 0.8905 - val_acc: 0.9048
Epoch 401/800
114/114 - 0s - loss: 0.6380 - acc: 0.9825 - val_loss: 0.8479 - val_acc: 0.9048
Epoch 402/800
114/114 - 0s - loss: 0.6263 - acc: 0.9912 - val_loss: 0.8394 - val_acc: 0.9048
Epoch 403/800
114/114 - 0s - loss: 0.6293 - acc: 0.9825 - val_loss: 0.8378 - val_acc: 0.9048
Epoch 404/800
114/114 - 0s - loss: 0.6369 - acc: 0.9825 - val_loss: 0.8441 - val_acc: 0.9048
Epoch 405/800
114/114 - 0s - loss: 0.6227 - acc: 0.9912 - val_loss: 0.8736 - val_acc: 0.9048
Epoch 406/800
114/114 - 0s - loss: 0.6059 - acc: 1.0000 - val_loss: 0.8930 - val_acc: 0.9048
Epoch 407/800
114/114 - 0s - loss: 0.6436 - acc: 0.9649 - val_loss: 0.8865 - val_acc: 0.9048
Epoch 408/800
114/114 - 0s - loss: 0.6624 - acc: 0.9737 - val_loss: 0.8877 - val_acc: 0.9048
Epoch 409/800
114/114 - 0s - loss: 0.7059 - acc: 0.9649 - val_loss: 0.8771 - val_acc: 0.9048
Epoch 410/800
114/114 - 0s - loss: 0.6265 - acc: 0.9912 - val_loss: 0.8610 - val_acc: 0.9048
Epoch 411/800
114/114 - 0s - loss: 0.6195 - acc: 0.9912 - val_loss: 0.8284 - val_acc: 0.9048
Epoch 412/800
114/114 - 0s - loss: 0.6430 - acc: 0.9649 - val_loss: 0.8168 - val_acc: 0.9048
```

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Epoch 413/800
114/114 - 0s - loss: 0.6184 - acc: 0.9912 - val_loss: 0.8152 - val_acc: 0.9048
Epoch 414/800
114/114 - 0s - loss: 0.6293 - acc: 0.9825 - val_loss: 0.8231 - val_acc: 0.9048
Epoch 415/800
114/114 - 0s - loss: 0.6170 - acc: 0.9912 - val_loss: 0.8311 - val_acc: 0.9048
Epoch 416/800
114/114 - 0s - loss: 0.6151 - acc: 0.9825 - val_loss: 0.8410 - val_acc: 0.9048
Epoch 417/800
114/114 - 0s - loss: 0.6191 - acc: 0.9912 - val_loss: 0.8514 - val_acc: 0.9048
Epoch 418/800
114/114 - 0s - loss: 0.7042 - acc: 0.9649 - val_loss: 0.8422 - val_acc: 0.9048
Epoch 419/800
114/114 - 0s - loss: 0.6211 - acc: 0.9912 - val_loss: 0.8395 - val_acc: 0.9048
Epoch 420/800
114/114 - 0s - loss: 0.6283 - acc: 0.9825 - val_loss: 0.8586 - val_acc: 0.9048
Epoch 421/800
114/114 - 0s - loss: 0.6334 - acc: 0.9737 - val_loss: 0.8635 - val_acc: 0.9048
Epoch 422/800
114/114 - 0s - loss: 0.6307 - acc: 0.9737 - val_loss: 0.8762 - val_acc: 0.9048
Epoch 423/800
114/114 - 0s - loss: 0.6434 - acc: 0.9825 - val_loss: 0.8962 - val_acc: 0.9048
Epoch 424/800
114/114 - 0s - loss: 0.6064 - acc: 0.9912 - val_loss: 0.9035 - val_acc: 0.9048
Epoch 425/800
114/114 - 0s - loss: 0.6536 - acc: 0.9561 - val_loss: 0.8934 - val_acc: 0.9048
Epoch 426/800
114/114 - 0s - loss: 0.6063 - acc: 0.9912 - val_loss: 0.8838 - val_acc: 0.9048
Epoch 427/800
114/114 - 0s - loss: 0.6340 - acc: 0.9825 - val_loss: 0.8769 - val_acc: 0.9048
Epoch 428/800
114/114 - 0s - loss: 0.6591 - acc: 0.9737 - val_loss: 0.8663 - val_acc: 0.9048
Epoch 429/800
114/114 - 0s - loss: 0.6189 - acc: 0.9912 - val_loss: 0.8420 - val_acc: 0.9048
Epoch 430/800
114/114 - 0s - loss: 0.6173 - acc: 0.9912 - val_loss: 0.8207 - val_acc: 0.9048
Epoch 431/800
114/114 - 0s - loss: 0.6374 - acc: 0.9825 - val_loss: 0.8115 - val_acc: 0.9048
Epoch 432/800
114/114 - 0s - loss: 0.6110 - acc: 0.9912 - val_loss: 0.8093 - val_acc: 0.9048
Epoch 433/800
114/114 - 0s - loss: 0.6266 - acc: 0.9825 - val_loss: 0.8227 - val_acc: 0.9048
Epoch 434/800
114/114 - 0s - loss: 0.6041 - acc: 0.9912 - val_loss: 0.8301 - val_acc: 0.9048
Epoch 435/800
114/114 - 0s - loss: 0.6418 - acc: 0.9737 - val_loss: 0.8359 - val_acc: 0.9048
Epoch 436/800
114/114 - 0s - loss: 0.6190 - acc: 0.9912 - val_loss: 0.8401 - val_acc: 0.9048
```

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Epoch 437/800
114/114 - 0s - loss: 0.6064 - acc: 1.0000 - val_loss: 0.8342 - val_acc: 0.9048
Epoch 438/800
114/114 - 0s - loss: 0.6217 - acc: 0.9912 - val_loss: 0.8330 - val_acc: 0.9048
Epoch 439/800
114/114 - 0s - loss: 0.6333 - acc: 0.9825 - val_loss: 0.8360 - val_acc: 0.9048
Epoch 440/800
114/114 - 0s - loss: 0.6106 - acc: 1.0000 - val_loss: 0.8350 - val_acc: 0.9048
Epoch 441/800
114/114 - 0s - loss: 0.6158 - acc: 0.9912 - val_loss: 0.8366 - val_acc: 0.9048
Epoch 442/800
114/114 - 0s - loss: 0.5987 - acc: 0.9912 - val_loss: 0.8417 - val_acc: 0.9048
Epoch 443/800
114/114 - 0s - loss: 0.6437 - acc: 0.9825 - val_loss: 0.8477 - val_acc: 0.9048
Epoch 444/800
114/114 - 0s - loss: 0.6418 - acc: 0.9649 - val_loss: 0.8517 - val_acc: 0.9048
Epoch 445/800
114/114 - 0s - loss: 0.6231 - acc: 0.9912 - val_loss: 0.8566 - val_acc: 0.9048
Epoch 446/800
114/114 - 0s - loss: 0.6571 - acc: 0.9737 - val_loss: 0.8652 - val_acc: 0.9048
Epoch 447/800
114/114 - 0s - loss: 0.6221 - acc: 0.9825 - val_loss: 0.8674 - val_acc: 0.9048
Epoch 448/800
114/114 - 0s - loss: 0.5925 - acc: 1.0000 - val_loss: 0.8685 - val_acc: 0.9048
Epoch 449/800
114/114 - 0s - loss: 0.5982 - acc: 0.9912 - val_loss: 0.8700 - val_acc: 0.9048
Epoch 450/800
114/114 - 0s - loss: 0.6025 - acc: 0.9825 - val_loss: 0.8711 - val_acc: 0.9048
Epoch 451/800
114/114 - 0s - loss: 0.6202 - acc: 0.9912 - val_loss: 0.8685 - val_acc: 0.9048
Epoch 452/800
114/114 - 0s - loss: 0.6227 - acc: 0.9825 - val_loss: 0.8616 - val_acc: 0.9048
Epoch 453/800
114/114 - 0s - loss: 0.6264 - acc: 0.9737 - val_loss: 0.8264 - val_acc: 0.9048
Epoch 454/800
114/114 - 0s - loss: 0.6737 - acc: 0.9737 - val_loss: 0.8228 - val_acc: 0.9048
Epoch 455/800
114/114 - 0s - loss: 0.5924 - acc: 1.0000 - val_loss: 0.8351 - val_acc: 0.9048
Epoch 456/800
114/114 - 0s - loss: 0.6131 - acc: 0.9825 - val_loss: 0.8411 - val_acc: 0.9048
Epoch 457/800
114/114 - 0s - loss: 0.6164 - acc: 0.9825 - val_loss: 0.8595 - val_acc: 0.9048
Epoch 458/800
114/114 - 0s - loss: 0.6172 - acc: 0.9912 - val_loss: 0.8644 - val_acc: 0.9048
Epoch 459/800
114/114 - 0s - loss: 0.6080 - acc: 1.0000 - val_loss: 0.8663 - val_acc: 0.9048
Epoch 460/800
114/114 - 0s - loss: 0.5965 - acc: 1.0000 - val_loss: 0.8618 - val_acc: 0.9048
```

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Epoch 461/800
114/114 - 0s - loss: 0.6298 - acc: 0.9825 - val_loss: 0.8649 - val_acc: 0.9048
Epoch 462/800
114/114 - 0s - loss: 0.6061 - acc: 0.9912 - val_loss: 0.8605 - val_acc: 0.9048
Epoch 463/800
114/114 - 0s - loss: 0.6153 - acc: 0.9912 - val_loss: 0.8539 - val_acc: 0.9048
Epoch 464/800
114/114 - 0s - loss: 0.5936 - acc: 0.9912 - val_loss: 0.8602 - val_acc: 0.9048
Epoch 465/800
114/114 - 0s - loss: 0.6335 - acc: 0.9825 - val_loss: 0.8923 - val_acc: 0.9048
Epoch 466/800
114/114 - 0s - loss: 0.6153 - acc: 0.9825 - val_loss: 0.8858 - val_acc: 0.9048
Epoch 467/800
114/114 - 0s - loss: 0.6651 - acc: 0.9737 - val_loss: 0.8941 - val_acc: 0.9048
Epoch 468/800
114/114 - 0s - loss: 0.5906 - acc: 1.0000 - val_loss: 0.9050 - val_acc: 0.9048
Epoch 469/800
114/114 - 0s - loss: 0.6166 - acc: 0.9737 - val_loss: 0.8989 - val_acc: 0.9048
Epoch 470/800
114/114 - 0s - loss: 0.5979 - acc: 0.9912 - val_loss: 0.8923 - val_acc: 0.9048
Epoch 471/800
114/114 - 0s - loss: 0.5922 - acc: 0.9912 - val_loss: 0.8779 - val_acc: 0.9048
Epoch 472/800
114/114 - 0s - loss: 0.6113 - acc: 0.9825 - val_loss: 0.8648 - val_acc: 0.9048
Epoch 473/800
114/114 - 0s - loss: 0.6068 - acc: 0.9912 - val_loss: 0.8598 - val_acc: 0.9048
Epoch 474/800
114/114 - 0s - loss: 0.6183 - acc: 0.9912 - val_loss: 0.8575 - val_acc: 0.9048
Epoch 475/800
114/114 - 0s - loss: 0.6411 - acc: 0.9649 - val_loss: 0.8585 - val_acc: 0.9048
Epoch 476/800
114/114 - 0s - loss: 0.5991 - acc: 0.9912 - val_loss: 0.8572 - val_acc: 0.9048
Epoch 477/800
114/114 - 0s - loss: 0.6118 - acc: 0.9912 - val_loss: 0.8481 - val_acc: 0.9048
Epoch 478/800
114/114 - 0s - loss: 0.6436 - acc: 0.9825 - val_loss: 0.8553 - val_acc: 0.9048
Epoch 479/800
114/114 - 0s - loss: 0.6031 - acc: 0.9825 - val_loss: 0.8500 - val_acc: 0.9048
Epoch 480/800
114/114 - 0s - loss: 0.6037 - acc: 0.9825 - val_loss: 0.8303 - val_acc: 0.9048
Epoch 481/800
114/114 - 0s - loss: 0.5946 - acc: 1.0000 - val_loss: 0.8195 - val_acc: 0.9048
Epoch 482/800
114/114 - 0s - loss: 0.6065 - acc: 0.9825 - val_loss: 0.8056 - val_acc: 0.9048
Epoch 483/800
114/114 - 0s - loss: 0.6520 - acc: 0.9737 - val_loss: 0.7758 - val_acc: 0.9048
Epoch 484/800
114/114 - 0s - loss: 0.5989 - acc: 0.9825 - val_loss: 0.7642 - val_acc: 0.9048
```

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Epoch 485/800
114/114 - 0s - loss: 0.6213 - acc: 0.9912 - val_loss: 0.7732 - val_acc: 0.9048
Epoch 486/800
114/114 - 0s - loss: 0.5835 - acc: 0.9912 - val_loss: 0.7883 - val_acc: 0.9048
Epoch 487/800
114/114 - 0s - loss: 0.5868 - acc: 0.9912 - val_loss: 0.8097 - val_acc: 0.9048
Epoch 488/800
114/114 - 0s - loss: 0.5983 - acc: 0.9912 - val_loss: 0.8257 - val_acc: 0.9048
Epoch 489/800
114/114 - 0s - loss: 0.6007 - acc: 0.9825 - val_loss: 0.8187 - val_acc: 0.9048
Epoch 490/800
114/114 - 0s - loss: 0.6041 - acc: 0.9912 - val_loss: 0.8119 - val_acc: 0.9048
Epoch 491/800
114/114 - 0s - loss: 0.6018 - acc: 0.9912 - val_loss: 0.8130 - val_acc: 0.9048
Epoch 492/800
114/114 - 0s - loss: 0.6425 - acc: 0.9649 - val_loss: 0.8208 - val_acc: 0.9048
Epoch 493/800
114/114 - 0s - loss: 0.5859 - acc: 0.9912 - val_loss: 0.8281 - val_acc: 0.9048
Epoch 494/800
114/114 - 0s - loss: 0.6414 - acc: 0.9737 - val_loss: 0.8263 - val_acc: 0.9048
Epoch 495/800
114/114 - 0s - loss: 0.5883 - acc: 0.9912 - val_loss: 0.8427 - val_acc: 0.9048
Epoch 496/800
114/114 - 0s - loss: 0.5936 - acc: 0.9912 - val_loss: 0.8554 - val_acc: 0.9048
Epoch 497/800
114/114 - 0s - loss: 0.5962 - acc: 0.9825 - val_loss: 0.8565 - val_acc: 0.9048
Epoch 498/800
114/114 - 0s - loss: 0.5803 - acc: 1.0000 - val_loss: 0.8605 - val_acc: 0.9048
Epoch 499/800
114/114 - 0s - loss: 0.6017 - acc: 0.9825 - val_loss: 0.8599 - val_acc: 0.9048
Epoch 500/800
114/114 - 0s - loss: 0.6185 - acc: 0.9825 - val_loss: 0.8492 - val_acc: 0.9048
Epoch 501/800
114/114 - 0s - loss: 0.5895 - acc: 0.9912 - val_loss: 0.8507 - val_acc: 0.9048
Epoch 502/800
114/114 - 0s - loss: 0.6087 - acc: 0.9912 - val_loss: 0.8686 - val_acc: 0.9048
Epoch 503/800
114/114 - 0s - loss: 0.5814 - acc: 1.0000 - val_loss: 0.8841 - val_acc: 0.9048
Epoch 504/800
114/114 - 0s - loss: 0.6133 - acc: 0.9737 - val_loss: 0.8860 - val_acc: 0.9048
Epoch 505/800
114/114 - 0s - loss: 0.6008 - acc: 0.9825 - val_loss: 0.8866 - val_acc: 0.9048
Epoch 506/800
114/114 - 0s - loss: 0.5936 - acc: 0.9825 - val_loss: 0.8893 - val_acc: 0.9048
Epoch 507/800
114/114 - 0s - loss: 0.6086 - acc: 0.9825 - val_loss: 0.8906 - val_acc: 0.9048
Epoch 508/800
114/114 - 0s - loss: 0.5900 - acc: 0.9912 - val_loss: 0.8764 - val_acc: 0.9048
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Epoch 509/800
114/114 - 0s - loss: 0.6004 - acc: 0.9825 - val_loss: 0.8372 - val_acc: 0.9048
Epoch 510/800
114/114 - 0s - loss: 0.5820 - acc: 0.9912 - val_loss: 0.7958 - val_acc: 0.9048
Epoch 511/800
114/114 - 0s - loss: 0.5852 - acc: 0.9825 - val_loss: 0.8176 - val_acc: 0.9048
Epoch 512/800
114/114 - 0s - loss: 0.5864 - acc: 0.9825 - val_loss: 0.8415 - val_acc: 0.9048
Epoch 513/800
114/114 - 0s - loss: 0.5806 - acc: 0.9912 - val_loss: 0.8510 - val_acc: 0.9048
Epoch 514/800
114/114 - 0s - loss: 0.5835 - acc: 0.9825 - val_loss: 0.8456 - val_acc: 0.9048
Epoch 515/800
114/114 - 0s - loss: 0.6084 - acc: 0.9737 - val_loss: 0.8409 - val_acc: 0.9048
Epoch 516/800
114/114 - 0s - loss: 0.6092 - acc: 0.9825 - val_loss: 0.8154 - val_acc: 0.9048
Epoch 517/800
114/114 - 0s - loss: 0.5776 - acc: 0.9912 - val_loss: 0.7831 - val_acc: 0.9048
Epoch 518/800
114/114 - 0s - loss: 0.6169 - acc: 0.9737 - val_loss: 0.8001 - val_acc: 0.9048
Epoch 519/800
114/114 - 0s - loss: 0.5827 - acc: 0.9825 - val_loss: 0.8186 - val_acc: 0.9048
Epoch 520/800
114/114 - 0s - loss: 0.5847 - acc: 0.9912 - val_loss: 0.8375 - val_acc: 0.9048
Epoch 521/800
114/114 - 0s - loss: 0.6038 - acc: 0.9825 - val_loss: 0.8539 - val_acc: 0.9048
Epoch 522/800
114/114 - 0s - loss: 0.5881 - acc: 0.9912 - val_loss: 0.8593 - val_acc: 0.9048
Epoch 523/800
114/114 - 0s - loss: 0.5783 - acc: 0.9912 - val_loss: 0.8449 - val_acc: 0.9048
Epoch 524/800
114/114 - 0s - loss: 0.5852 - acc: 0.9825 - val_loss: 0.8421 - val_acc: 0.9048
Epoch 525/800
114/114 - 0s - loss: 0.6268 - acc: 0.9825 - val_loss: 0.8350 - val_acc: 0.9048
Epoch 526/800
114/114 - 0s - loss: 0.5754 - acc: 0.9912 - val_loss: 0.8304 - val_acc: 0.9048
Epoch 527/800
114/114 - 0s - loss: 0.5875 - acc: 0.9825 - val_loss: 0.8278 - val_acc: 0.9048
Epoch 528/800
114/114 - 0s - loss: 0.5783 - acc: 0.9912 - val_loss: 0.8279 - val_acc: 0.9048
Epoch 529/800
114/114 - 0s - loss: 0.5715 - acc: 1.0000 - val_loss: 0.8214 - val_acc: 0.9048
Epoch 530/800
114/114 - 0s - loss: 0.5832 - acc: 0.9825 - val_loss: 0.8332 - val_acc: 0.9048
Epoch 531/800
114/114 - 0s - loss: 0.6022 - acc: 0.9737 - val_loss: 0.8382 - val_acc: 0.9048
Epoch 532/800
114/114 - 0s - loss: 0.6001 - acc: 0.9825 - val_loss: 0.8450 - val_acc: 0.9048
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Epoch 533/800
114/114 - 0s - loss: 0.5644 - acc: 1.0000 - val_loss: 0.8207 - val_acc: 0.9048
Epoch 534/800
114/114 - 0s - loss: 0.7091 - acc: 0.9561 - val_loss: 0.8719 - val_acc: 0.9048
Epoch 535/800
114/114 - 0s - loss: 0.5719 - acc: 0.9912 - val_loss: 0.8855 - val_acc: 0.9048
Epoch 536/800
114/114 - 0s - loss: 0.6023 - acc: 0.9825 - val_loss: 0.8837 - val_acc: 0.9048
Epoch 537/800
114/114 - 0s - loss: 0.6154 - acc: 0.9825 - val_loss: 0.8593 - val_acc: 0.9048
Epoch 538/800
114/114 - 0s - loss: 0.5825 - acc: 0.9825 - val_loss: 0.8525 - val_acc: 0.9048
Epoch 539/800
114/114 - 0s - loss: 0.5710 - acc: 0.9912 - val_loss: 0.8463 - val_acc: 0.9048
Epoch 540/800
114/114 - 0s - loss: 0.5774 - acc: 0.9912 - val_loss: 0.8494 - val_acc: 0.9048
Epoch 541/800
114/114 - 0s - loss: 0.5654 - acc: 1.0000 - val_loss: 0.8497 - val_acc: 0.9048
Epoch 542/800
114/114 - 0s - loss: 0.5745 - acc: 0.9912 - val_loss: 0.8404 - val_acc: 0.9048
Epoch 543/800
114/114 - 0s - loss: 0.5828 - acc: 0.9912 - val_loss: 0.8295 - val_acc: 0.9048
Epoch 544/800
114/114 - 0s - loss: 0.5752 - acc: 0.9912 - val_loss: 0.8233 - val_acc: 0.9048
Epoch 545/800
114/114 - 0s - loss: 0.5731 - acc: 1.0000 - val_loss: 0.8379 - val_acc: 0.9048
Epoch 546/800
114/114 - 0s - loss: 0.5786 - acc: 0.9912 - val_loss: 0.8476 - val_acc: 0.9048
Epoch 547/800
114/114 - 0s - loss: 0.5635 - acc: 1.0000 - val_loss: 0.8475 - val_acc: 0.9048
Epoch 548/800
114/114 - 0s - loss: 0.5634 - acc: 0.9912 - val_loss: 0.8274 - val_acc: 0.9048
Epoch 549/800
114/114 - 0s - loss: 0.6071 - acc: 0.9825 - val_loss: 0.8360 - val_acc: 0.9048
Epoch 550/800
114/114 - 0s - loss: 0.5688 - acc: 0.9912 - val_loss: 0.8573 - val_acc: 0.9048
Epoch 551/800
114/114 - 0s - loss: 0.5853 - acc: 0.9737 - val_loss: 0.8625 - val_acc: 0.9048
Epoch 552/800
114/114 - 0s - loss: 0.5908 - acc: 0.9825 - val_loss: 0.8563 - val_acc: 0.9048
Epoch 553/800
114/114 - 0s - loss: 0.5670 - acc: 0.9912 - val_loss: 0.8526 - val_acc: 0.9048
Epoch 554/800
114/114 - 0s - loss: 0.5684 - acc: 0.9912 - val_loss: 0.8536 - val_acc: 0.9048
Epoch 555/800
114/114 - 0s - loss: 0.6084 - acc: 0.9825 - val_loss: 0.8635 - val_acc: 0.9048
Epoch 556/800
114/114 - 0s - loss: 0.5641 - acc: 1.0000 - val_loss: 0.8742 - val_acc: 0.9048
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Epoch 557/800
114/114 - 0s - loss: 0.6093 - acc: 0.9737 - val_loss: 0.8654 - val_acc: 0.9048
Epoch 558/800
114/114 - 0s - loss: 0.6556 - acc: 0.9649 - val_loss: 0.8524 - val_acc: 0.9048
Epoch 559/800
114/114 - 0s - loss: 0.5720 - acc: 0.9912 - val_loss: 0.8327 - val_acc: 0.9048
Epoch 560/800
114/114 - 0s - loss: 0.5710 - acc: 0.9912 - val_loss: 0.8116 - val_acc: 0.9048
Epoch 561/800
114/114 - 0s - loss: 0.5872 - acc: 0.9737 - val_loss: 0.8192 - val_acc: 0.9048
Epoch 562/800
114/114 - 0s - loss: 0.5673 - acc: 1.0000 - val_loss: 0.8269 - val_acc: 0.9048
Epoch 563/800
114/114 - 0s - loss: 0.5871 - acc: 0.9825 - val_loss: 0.8233 - val_acc: 0.9048
Epoch 564/800
114/114 - 0s - loss: 0.5649 - acc: 0.9912 - val_loss: 0.8251 - val_acc: 0.9048
Epoch 565/800
114/114 - 0s - loss: 0.5712 - acc: 0.9825 - val_loss: 0.8246 - val_acc: 0.9048
Epoch 566/800
114/114 - 0s - loss: 0.5820 - acc: 0.9825 - val_loss: 0.8084 - val_acc: 0.9048
Epoch 567/800
114/114 - 0s - loss: 0.5788 - acc: 0.9912 - val_loss: 0.7940 - val_acc: 0.9048
Epoch 568/800
114/114 - 0s - loss: 0.5814 - acc: 0.9825 - val_loss: 0.8032 - val_acc: 0.9048
Epoch 569/800
114/114 - 0s - loss: 0.5545 - acc: 1.0000 - val_loss: 0.8234 - val_acc: 0.9048
Epoch 570/800
114/114 - 0s - loss: 0.5553 - acc: 1.0000 - val_loss: 0.8370 - val_acc: 0.9048
Epoch 571/800
114/114 - 0s - loss: 0.5788 - acc: 0.9737 - val_loss: 0.8431 - val_acc: 0.9048
Epoch 572/800
114/114 - 0s - loss: 0.5755 - acc: 0.9825 - val_loss: 0.8434 - val_acc: 0.9048
Epoch 573/800
114/114 - 0s - loss: 0.5661 - acc: 0.9912 - val_loss: 0.8367 - val_acc: 0.9048
Epoch 574/800
114/114 - 0s - loss: 0.5910 - acc: 0.9912 - val_loss: 0.8370 - val_acc: 0.9048
Epoch 575/800
114/114 - 0s - loss: 0.5746 - acc: 0.9825 - val_loss: 0.8466 - val_acc: 0.9048
Epoch 576/800
114/114 - 0s - loss: 0.5860 - acc: 0.9737 - val_loss: 0.8569 - val_acc: 0.9048
Epoch 577/800
114/114 - 0s - loss: 0.5725 - acc: 0.9825 - val_loss: 0.8648 - val_acc: 0.9048
Epoch 578/800
114/114 - 0s - loss: 0.5678 - acc: 0.9825 - val_loss: 0.8673 - val_acc: 0.9048
Epoch 579/800
114/114 - 0s - loss: 0.5662 - acc: 0.9825 - val_loss: 0.8686 - val_acc: 0.9048
Epoch 580/800
114/114 - 0s - loss: 0.5959 - acc: 0.9825 - val_loss: 0.8706 - val_acc: 0.9048
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Epoch 581/800
114/114 - 0s - loss: 0.5590 - acc: 0.9912 - val_loss: 0.8755 - val_acc: 0.9048
Epoch 582/800
114/114 - 0s - loss: 0.5566 - acc: 1.0000 - val_loss: 0.8513 - val_acc: 0.9048
Epoch 583/800
114/114 - 0s - loss: 0.5762 - acc: 0.9912 - val_loss: 0.8309 - val_acc: 0.9048
Epoch 584/800
114/114 - 0s - loss: 0.5540 - acc: 0.9912 - val_loss: 0.8305 - val_acc: 0.9048
Epoch 585/800
114/114 - 0s - loss: 0.5551 - acc: 0.9912 - val_loss: 0.8316 - val_acc: 0.9048
Epoch 586/800
114/114 - 0s - loss: 0.5762 - acc: 0.9912 - val_loss: 0.8394 - val_acc: 0.9048
Epoch 587/800
114/114 - 0s - loss: 0.5497 - acc: 1.0000 - val_loss: 0.8488 - val_acc: 0.9048
Epoch 588/800
114/114 - 0s - loss: 0.5476 - acc: 1.0000 - val_loss: 0.8559 - val_acc: 0.9048
Epoch 589/800
114/114 - 0s - loss: 0.5546 - acc: 0.9912 - val_loss: 0.8628 - val_acc: 0.9048
Epoch 590/800
114/114 - 0s - loss: 0.5512 - acc: 0.9912 - val_loss: 0.8679 - val_acc: 0.9048
Epoch 591/800
114/114 - 0s - loss: 0.5561 - acc: 0.9912 - val_loss: 0.8619 - val_acc: 0.9048
Epoch 592/800
114/114 - 0s - loss: 0.6019 - acc: 0.9825 - val_loss: 0.8642 - val_acc: 0.9048
Epoch 593/800
114/114 - 0s - loss: 0.5452 - acc: 1.0000 - val_loss: 0.8600 - val_acc: 0.9048
Epoch 594/800
114/114 - 0s - loss: 0.5604 - acc: 1.0000 - val_loss: 0.8505 - val_acc: 0.9048
Epoch 595/800
114/114 - 0s - loss: 0.5447 - acc: 1.0000 - val_loss: 0.8469 - val_acc: 0.9048
Epoch 596/800
114/114 - 0s - loss: 0.5424 - acc: 1.0000 - val_loss: 0.8408 - val_acc: 0.9048
Epoch 597/800
114/114 - 0s - loss: 0.5571 - acc: 0.9912 - val_loss: 0.8375 - val_acc: 0.9048
Epoch 598/800
114/114 - 0s - loss: 0.5583 - acc: 0.9912 - val_loss: 0.8286 - val_acc: 0.9048
Epoch 599/800
114/114 - 0s - loss: 0.5659 - acc: 0.9825 - val_loss: 0.8175 - val_acc: 0.9524
Epoch 600/800
114/114 - 0s - loss: 0.5631 - acc: 0.9912 - val_loss: 0.8298 - val_acc: 0.9524
Epoch 601/800
114/114 - 0s - loss: 0.5858 - acc: 0.9825 - val_loss: 0.8077 - val_acc: 0.9524
Epoch 602/800
114/114 - 0s - loss: 0.5664 - acc: 0.9912 - val_loss: 0.7763 - val_acc: 0.9524
Epoch 603/800
114/114 - 0s - loss: 0.5438 - acc: 1.0000 - val_loss: 0.7784 - val_acc: 0.9048
Epoch 604/800
114/114 - 0s - loss: 0.5754 - acc: 0.9825 - val_loss: 0.7942 - val_acc: 0.9048
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Epoch 605/800
114/114 - 0s - loss: 0.5918 - acc: 0.9737 - val_loss: 0.8060 - val_acc: 0.9048
Epoch 606/800
114/114 - 0s - loss: 0.5822 - acc: 0.9912 - val_loss: 0.8185 - val_acc: 0.9048
Epoch 607/800
114/114 - 0s - loss: 0.5461 - acc: 1.0000 - val_loss: 0.8044 - val_acc: 0.9048
Epoch 608/800
114/114 - 0s - loss: 0.6077 - acc: 0.9649 - val_loss: 0.7941 - val_acc: 0.9048
Epoch 609/800
114/114 - 0s - loss: 0.6040 - acc: 0.9737 - val_loss: 0.7952 - val_acc: 0.9524
Epoch 610/800
114/114 - 0s - loss: 0.5462 - acc: 1.0000 - val_loss: 0.8043 - val_acc: 0.9524
Epoch 611/800
114/114 - 0s - loss: 0.5665 - acc: 0.9825 - val_loss: 0.7961 - val_acc: 0.9524
Epoch 612/800
114/114 - 0s - loss: 0.5877 - acc: 0.9649 - val_loss: 0.8013 - val_acc: 0.9524
Epoch 613/800
114/114 - 0s - loss: 0.5524 - acc: 1.0000 - val_loss: 0.8112 - val_acc: 0.9048
Epoch 614/800
114/114 - 0s - loss: 0.5457 - acc: 0.9912 - val_loss: 0.8527 - val_acc: 0.9048
Epoch 615/800
114/114 - 0s - loss: 0.5691 - acc: 0.9825 - val_loss: 0.8254 - val_acc: 0.9048
Epoch 616/800
114/114 - 0s - loss: 0.5365 - acc: 1.0000 - val_loss: 0.7897 - val_acc: 0.9048
Epoch 617/800
114/114 - 0s - loss: 0.5812 - acc: 0.9737 - val_loss: 0.7907 - val_acc: 0.9048
Epoch 618/800
114/114 - 0s - loss: 0.5750 - acc: 0.9737 - val_loss: 0.8238 - val_acc: 0.9048
Epoch 619/800
114/114 - 0s - loss: 0.5777 - acc: 0.9825 - val_loss: 0.8606 - val_acc: 0.9048
Epoch 620/800
114/114 - 0s - loss: 0.5644 - acc: 0.9912 - val_loss: 0.8431 - val_acc: 0.9048
Epoch 621/800
114/114 - 0s - loss: 0.5816 - acc: 0.9825 - val_loss: 0.8365 - val_acc: 0.9048
Epoch 622/800
114/114 - 0s - loss: 0.5804 - acc: 0.9737 - val_loss: 0.8193 - val_acc: 0.9048
Epoch 623/800
114/114 - 0s - loss: 0.5769 - acc: 0.9825 - val_loss: 0.7838 - val_acc: 0.9048
Epoch 624/800
114/114 - 0s - loss: 0.5397 - acc: 1.0000 - val_loss: 0.7835 - val_acc: 0.9048
Epoch 625/800
114/114 - 0s - loss: 0.5879 - acc: 0.9649 - val_loss: 0.7947 - val_acc: 0.9048
Epoch 626/800
114/114 - 0s - loss: 0.5707 - acc: 0.9737 - val_loss: 0.8415 - val_acc: 0.9048
Epoch 627/800
114/114 - 0s - loss: 0.5506 - acc: 0.9912 - val_loss: 0.8308 - val_acc: 0.9048
Epoch 628/800
114/114 - 0s - loss: 0.5553 - acc: 0.9825 - val_loss: 0.8233 - val_acc: 0.9524
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Epoch 629/800
114/114 - 0s - loss: 0.5803 - acc: 0.9825 - val_loss: 0.8070 - val_acc: 0.9048
Epoch 630/800
114/114 - 0s - loss: 0.5386 - acc: 1.0000 - val_loss: 0.8049 - val_acc: 0.9048
Epoch 631/800
114/114 - 0s - loss: 0.5774 - acc: 0.9649 - val_loss: 0.8089 - val_acc: 0.9048
Epoch 632/800
114/114 - 0s - loss: 0.5553 - acc: 0.9825 - val_loss: 0.8109 - val_acc: 0.9048
Epoch 633/800
114/114 - 0s - loss: 0.5552 - acc: 0.9912 - val_loss: 0.8216 - val_acc: 0.9048
Epoch 634/800
114/114 - 0s - loss: 0.5476 - acc: 0.9912 - val_loss: 0.8247 - val_acc: 0.9048
Epoch 635/800
114/114 - 0s - loss: 0.5605 - acc: 0.9912 - val_loss: 0.8270 - val_acc: 0.9048
Epoch 636/800
114/114 - 0s - loss: 0.6241 - acc: 0.9737 - val_loss: 0.8357 - val_acc: 0.9048
Epoch 637/800
114/114 - 0s - loss: 0.5517 - acc: 0.9912 - val_loss: 0.8357 - val_acc: 0.9048
Epoch 638/800
114/114 - 0s - loss: 0.5412 - acc: 0.9912 - val_loss: 0.8370 - val_acc: 0.9048
Epoch 639/800
114/114 - 0s - loss: 0.5411 - acc: 0.9912 - val_loss: 0.8422 - val_acc: 0.9048
Epoch 640/800
114/114 - 0s - loss: 0.5359 - acc: 1.0000 - val_loss: 0.8493 - val_acc: 0.9048
Epoch 641/800
114/114 - 0s - loss: 0.5590 - acc: 0.9825 - val_loss: 0.8554 - val_acc: 0.9048
Epoch 642/800
114/114 - 0s - loss: 0.5528 - acc: 0.9912 - val_loss: 0.8489 - val_acc: 0.9048
Epoch 643/800
114/114 - 0s - loss: 0.5506 - acc: 0.9912 - val_loss: 0.8408 - val_acc: 0.9048
Epoch 644/800
114/114 - 0s - loss: 0.5547 - acc: 0.9912 - val_loss: 0.8173 - val_acc: 0.9048
Epoch 645/800
114/114 - 0s - loss: 0.5968 - acc: 0.9737 - val_loss: 0.7849 - val_acc: 0.9048
Epoch 646/800
114/114 - 0s - loss: 0.5355 - acc: 1.0000 - val_loss: 0.7684 - val_acc: 0.9048
Epoch 647/800
114/114 - 0s - loss: 0.5393 - acc: 0.9912 - val_loss: 0.7704 - val_acc: 0.9048
Epoch 648/800
114/114 - 0s - loss: 0.5268 - acc: 1.0000 - val_loss: 0.7736 - val_acc: 0.9048
Epoch 649/800
114/114 - 0s - loss: 0.5485 - acc: 0.9825 - val_loss: 0.7744 - val_acc: 0.9048
Epoch 650/800
114/114 - 0s - loss: 0.5498 - acc: 0.9912 - val_loss: 0.7854 - val_acc: 0.9048
Epoch 651/800
114/114 - 0s - loss: 0.5663 - acc: 0.9825 - val_loss: 0.7946 - val_acc: 0.9048
Epoch 652/800
114/114 - 0s - loss: 0.5452 - acc: 0.9912 - val_loss: 0.8050 - val_acc: 0.9048
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Epoch 653/800
114/114 - 0s - loss: 0.5649 - acc: 0.9825 - val_loss: 0.8031 - val_acc: 0.9048
Epoch 654/800
114/114 - 0s - loss: 0.5332 - acc: 1.0000 - val_loss: 0.7853 - val_acc: 0.9048
Epoch 655/800
114/114 - 0s - loss: 0.5296 - acc: 1.0000 - val_loss: 0.7680 - val_acc: 0.9048
Epoch 656/800
114/114 - 0s - loss: 0.5622 - acc: 0.9912 - val_loss: 0.7586 - val_acc: 0.9048
Epoch 657/800
114/114 - 0s - loss: 0.5896 - acc: 0.9737 - val_loss: 0.7628 - val_acc: 0.9048
Epoch 658/800
114/114 - 0s - loss: 0.5584 - acc: 0.9912 - val_loss: 0.7751 - val_acc: 0.9048
Epoch 659/800
114/114 - 0s - loss: 0.5618 - acc: 0.9737 - val_loss: 0.8007 - val_acc: 0.9048
Epoch 660/800
114/114 - 0s - loss: 0.5465 - acc: 0.9912 - val_loss: 0.7735 - val_acc: 0.9048
Epoch 661/800
114/114 - 0s - loss: 0.5440 - acc: 0.9912 - val_loss: 0.7484 - val_acc: 0.9048
Epoch 662/800
114/114 - 0s - loss: 0.5511 - acc: 0.9737 - val_loss: 0.7567 - val_acc: 0.9048
Epoch 663/800
114/114 - 0s - loss: 0.5356 - acc: 1.0000 - val_loss: 0.7795 - val_acc: 0.9048
Epoch 664/800
114/114 - 0s - loss: 0.5490 - acc: 0.9912 - val_loss: 0.7929 - val_acc: 0.9048
Epoch 665/800
114/114 - 0s - loss: 0.5346 - acc: 1.0000 - val_loss: 0.7806 - val_acc: 0.9048
Epoch 666/800
114/114 - 0s - loss: 0.5649 - acc: 0.9825 - val_loss: 0.7700 - val_acc: 0.9048
Epoch 667/800
114/114 - 0s - loss: 0.5557 - acc: 0.9737 - val_loss: 0.7834 - val_acc: 0.9048
Epoch 668/800
114/114 - 0s - loss: 0.5840 - acc: 0.9825 - val_loss: 0.8122 - val_acc: 0.9048
Epoch 669/800
114/114 - 0s - loss: 0.5758 - acc: 0.9737 - val_loss: 0.8603 - val_acc: 0.9048
Epoch 670/800
114/114 - 0s - loss: 0.5467 - acc: 0.9912 - val_loss: 0.8599 - val_acc: 0.9048
Epoch 671/800
114/114 - 0s - loss: 0.5234 - acc: 1.0000 - val_loss: 0.8369 - val_acc: 0.9048
Epoch 672/800
114/114 - 0s - loss: 0.5609 - acc: 0.9912 - val_loss: 0.8191 - val_acc: 0.9524
Epoch 673/800
114/114 - 0s - loss: 0.5683 - acc: 0.9825 - val_loss: 0.8012 - val_acc: 0.9048
Epoch 674/800
114/114 - 0s - loss: 0.5892 - acc: 0.9561 - val_loss: 0.7884 - val_acc: 0.9048
Epoch 675/800
114/114 - 0s - loss: 0.5574 - acc: 0.9825 - val_loss: 0.7541 - val_acc: 0.9524
Epoch 676/800
114/114 - 0s - loss: 0.5637 - acc: 0.9912 - val_loss: 0.7727 - val_acc: 0.9524
```

```
Epoch 677/800
114/114 - 0s - loss: 0.5639 - acc: 0.9737 - val_loss: 0.7720 - val_acc: 0.9524
Epoch 678/800
114/114 - 0s - loss: 0.5573 - acc: 0.9825 - val_loss: 0.7562 - val_acc: 0.9048
Epoch 679/800
114/114 - 0s - loss: 0.5587 - acc: 0.9825 - val_loss: 0.8170 - val_acc: 0.9048
Epoch 680/800
114/114 - 0s - loss: 0.5264 - acc: 1.0000 - val_loss: 0.8258 - val_acc: 0.9048
Epoch 681/800
114/114 - 0s - loss: 0.5446 - acc: 0.9825 - val_loss: 0.8234 - val_acc: 0.9524
Epoch 682/800
114/114 - 0s - loss: 0.5344 - acc: 1.0000 - val_loss: 0.8244 - val_acc: 0.9524
Epoch 683/800
114/114 - 0s - loss: 0.5482 - acc: 0.9825 - val_loss: 0.8121 - val_acc: 0.9524
Epoch 684/800
114/114 - 0s - loss: 0.6040 - acc: 0.9737 - val_loss: 0.7939 - val_acc: 0.9524
Epoch 685/800
114/114 - 0s - loss: 0.5281 - acc: 1.0000 - val_loss: 0.7742 - val_acc: 0.9048
Epoch 686/800
114/114 - 0s - loss: 0.5407 - acc: 0.9912 - val_loss: 0.7555 - val_acc: 0.9048
Epoch 687/800
114/114 - 0s - loss: 0.5300 - acc: 0.9912 - val_loss: 0.7604 - val_acc: 0.9048
Epoch 688/800
114/114 - 0s - loss: 0.6362 - acc: 0.9649 - val_loss: 0.7702 - val_acc: 0.9048
Epoch 689/800
114/114 - 0s - loss: 0.5549 - acc: 0.9825 - val_loss: 0.7950 - val_acc: 0.9048
Epoch 690/800
114/114 - 0s - loss: 0.5168 - acc: 1.0000 - val_loss: 0.8093 - val_acc: 0.9048
Epoch 691/800
114/114 - 0s - loss: 0.5479 - acc: 0.9825 - val_loss: 0.8356 - val_acc: 0.9048
Epoch 692/800
114/114 - 0s - loss: 0.5675 - acc: 0.9825 - val_loss: 0.8469 - val_acc: 0.9048
Epoch 693/800
114/114 - 0s - loss: 0.5570 - acc: 0.9825 - val_loss: 0.8306 - val_acc: 0.9048
Epoch 694/800
114/114 - 0s - loss: 0.5258 - acc: 0.9912 - val_loss: 0.8092 - val_acc: 0.9048
Epoch 695/800
114/114 - 0s - loss: 0.5506 - acc: 0.9825 - val_loss: 0.7986 - val_acc: 0.9048
Epoch 696/800
114/114 - 0s - loss: 0.5242 - acc: 1.0000 - val_loss: 0.7969 - val_acc: 0.9048
Epoch 697/800
114/114 - 0s - loss: 0.5398 - acc: 0.9912 - val_loss: 0.8011 - val_acc: 0.9048
Epoch 698/800
114/114 - 0s - loss: 0.5888 - acc: 0.9737 - val_loss: 0.8054 - val_acc: 0.9048
Epoch 699/800
114/114 - 0s - loss: 0.5602 - acc: 0.9825 - val_loss: 0.8326 - val_acc: 0.9048
Epoch 700/800
114/114 - 0s - loss: 0.5329 - acc: 0.9825 - val_loss: 0.8336 - val_acc: 0.9048
```

```
Epoch 701/800
114/114 - 0s - loss: 0.5224 - acc: 1.0000 - val_loss: 0.8239 - val_acc: 0.9048
Epoch 702/800
114/114 - 0s - loss: 0.5609 - acc: 0.9737 - val_loss: 0.8158 - val_acc: 0.9048
Epoch 703/800
114/114 - 0s - loss: 0.6175 - acc: 0.9737 - val_loss: 0.7986 - val_acc: 0.9048
Epoch 704/800
114/114 - 0s - loss: 0.5316 - acc: 1.0000 - val_loss: 0.7842 - val_acc: 0.9048
Epoch 705/800
114/114 - 0s - loss: 0.5384 - acc: 0.9912 - val_loss: 0.7801 - val_acc: 0.9048
Epoch 706/800
114/114 - 0s - loss: 0.5405 - acc: 0.9825 - val_loss: 0.7771 - val_acc: 0.9048
Epoch 707/800
114/114 - 0s - loss: 0.5290 - acc: 0.9825 - val_loss: 0.7640 - val_acc: 0.9048
Epoch 708/800
114/114 - 0s - loss: 0.5453 - acc: 0.9912 - val_loss: 0.7577 - val_acc: 0.9048
Epoch 709/800
114/114 - 0s - loss: 0.5145 - acc: 1.0000 - val_loss: 0.7573 - val_acc: 0.9048
Epoch 710/800
114/114 - 0s - loss: 0.5126 - acc: 1.0000 - val_loss: 0.7573 - val_acc: 0.9048
Epoch 711/800
114/114 - 0s - loss: 0.5284 - acc: 0.9912 - val_loss: 0.7683 - val_acc: 0.9048
Epoch 712/800
114/114 - 0s - loss: 0.5445 - acc: 0.9912 - val_loss: 0.7885 - val_acc: 0.9048
Epoch 713/800
114/114 - 0s - loss: 0.5333 - acc: 0.9912 - val_loss: 0.7983 - val_acc: 0.9048
Epoch 714/800
114/114 - 0s - loss: 0.5189 - acc: 1.0000 - val_loss: 0.8120 - val_acc: 0.9524
Epoch 715/800
114/114 - 0s - loss: 0.5636 - acc: 0.9737 - val_loss: 0.8044 - val_acc: 0.9048
Epoch 716/800
114/114 - 0s - loss: 0.5276 - acc: 0.9912 - val_loss: 0.7914 - val_acc: 0.9048
Epoch 717/800
114/114 - 0s - loss: 0.5649 - acc: 0.9825 - val_loss: 0.7854 - val_acc: 0.9048
Epoch 718/800
114/114 - 0s - loss: 0.5231 - acc: 1.0000 - val_loss: 0.7854 - val_acc: 0.9048
Epoch 719/800
114/114 - 0s - loss: 0.5231 - acc: 0.9912 - val_loss: 0.7491 - val_acc: 0.9048
Epoch 720/800
114/114 - 0s - loss: 0.5231 - acc: 0.9912 - val_loss: 0.7338 - val_acc: 0.9524
Epoch 721/800
114/114 - 0s - loss: 0.5144 - acc: 1.0000 - val_loss: 0.7345 - val_acc: 0.9524
Epoch 722/800
114/114 - 0s - loss: 0.5521 - acc: 0.9825 - val_loss: 0.7404 - val_acc: 0.9048
Epoch 723/800
114/114 - 0s - loss: 0.5402 - acc: 0.9912 - val_loss: 0.7730 - val_acc: 0.9048
Epoch 724/800
114/114 - 0s - loss: 0.5254 - acc: 0.9912 - val_loss: 0.7942 - val_acc: 0.9048
```

```
Epoch 725/800
114/114 - 0s - loss: 0.5555 - acc: 0.9737 - val_loss: 0.7989 - val_acc: 0.9048
Epoch 726/800
114/114 - 0s - loss: 0.5302 - acc: 0.9912 - val_loss: 0.8089 - val_acc: 0.9048
Epoch 727/800
114/114 - 0s - loss: 0.5197 - acc: 0.9912 - val_loss: 0.8102 - val_acc: 0.9048
Epoch 728/800
114/114 - 0s - loss: 0.5189 - acc: 1.0000 - val_loss: 0.8145 - val_acc: 0.9048
Epoch 729/800
114/114 - 0s - loss: 0.5490 - acc: 0.9825 - val_loss: 0.8103 - val_acc: 0.9048
Epoch 730/800
114/114 - 0s - loss: 0.5694 - acc: 0.9737 - val_loss: 0.7647 - val_acc: 0.9048
Epoch 731/800
114/114 - 0s - loss: 0.5381 - acc: 0.9912 - val_loss: 0.7412 - val_acc: 0.9524
Epoch 732/800
114/114 - 0s - loss: 0.5917 - acc: 0.9737 - val_loss: 0.7663 - val_acc: 0.9048
Epoch 733/800
114/114 - 0s - loss: 0.5499 - acc: 0.9737 - val_loss: 0.8134 - val_acc: 0.9048
Epoch 734/800
114/114 - 0s - loss: 0.5201 - acc: 0.9912 - val_loss: 0.8187 - val_acc: 0.9048
Epoch 735/800
114/114 - 0s - loss: 0.5109 - acc: 1.0000 - val_loss: 0.8139 - val_acc: 0.9048
Epoch 736/800
114/114 - 0s - loss: 0.5358 - acc: 0.9737 - val_loss: 0.8008 - val_acc: 0.9048
Epoch 737/800
114/114 - 0s - loss: 0.5160 - acc: 1.0000 - val_loss: 0.7796 - val_acc: 0.9048
Epoch 738/800
114/114 - 0s - loss: 0.5211 - acc: 0.9825 - val_loss: 0.7664 - val_acc: 0.9048
Epoch 739/800
114/114 - 0s - loss: 0.5166 - acc: 0.9912 - val_loss: 0.7654 - val_acc: 0.9048
Epoch 740/800
114/114 - 0s - loss: 0.5081 - acc: 1.0000 - val_loss: 0.7712 - val_acc: 0.9048
Epoch 741/800
114/114 - 0s - loss: 0.5253 - acc: 0.9912 - val_loss: 0.7899 - val_acc: 0.9048
Epoch 742/800
114/114 - 0s - loss: 0.5137 - acc: 1.0000 - val_loss: 0.8115 - val_acc: 0.9048
Epoch 743/800
114/114 - 0s - loss: 0.5144 - acc: 1.0000 - val_loss: 0.8241 - val_acc: 0.9048
Epoch 744/800
114/114 - 0s - loss: 0.5112 - acc: 1.0000 - val_loss: 0.8310 - val_acc: 0.9048
Epoch 745/800
114/114 - 0s - loss: 0.5148 - acc: 1.0000 - val_loss: 0.8335 - val_acc: 0.9048
Epoch 746/800
114/114 - 0s - loss: 0.5340 - acc: 0.9912 - val_loss: 0.8308 - val_acc: 0.9048
Epoch 747/800
114/114 - 0s - loss: 0.5101 - acc: 1.0000 - val_loss: 0.8238 - val_acc: 0.9048
Epoch 748/800
114/114 - 0s - loss: 0.5108 - acc: 1.0000 - val_loss: 0.8024 - val_acc: 0.9048
```

```
Epoch 749/800
114/114 - 0s - loss: 0.5326 - acc: 0.9912 - val_loss: 0.7943 - val_acc: 0.9048
Epoch 750/800
114/114 - 0s - loss: 0.5090 - acc: 1.0000 - val_loss: 0.8111 - val_acc: 0.9048
Epoch 751/800
114/114 - 0s - loss: 0.5178 - acc: 0.9825 - val_loss: 0.8073 - val_acc: 0.9048
Epoch 752/800
114/114 - 0s - loss: 0.5219 - acc: 0.9912 - val_loss: 0.8251 - val_acc: 0.9048
Epoch 753/800
114/114 - 0s - loss: 0.5476 - acc: 0.9737 - val_loss: 0.8345 - val_acc: 0.9048
Epoch 754/800
114/114 - 0s - loss: 0.5281 - acc: 0.9912 - val_loss: 0.8329 - val_acc: 0.9048
Epoch 755/800
114/114 - 0s - loss: 0.5438 - acc: 0.9737 - val_loss: 0.8037 - val_acc: 0.9048
Epoch 756/800
114/114 - 0s - loss: 0.5456 - acc: 0.9737 - val_loss: 0.7682 - val_acc: 0.9048
Epoch 757/800
114/114 - 0s - loss: 0.5118 - acc: 1.0000 - val_loss: 0.7509 - val_acc: 0.9048
Epoch 758/800
114/114 - 0s - loss: 0.5390 - acc: 0.9912 - val_loss: 0.7340 - val_acc: 0.9048
Epoch 759/800
114/114 - 0s - loss: 0.5158 - acc: 0.9912 - val_loss: 0.7335 - val_acc: 0.9048
Epoch 760/800
114/114 - 0s - loss: 0.5465 - acc: 0.9737 - val_loss: 0.7546 - val_acc: 0.9048
Epoch 761/800
114/114 - 0s - loss: 0.5195 - acc: 0.9912 - val_loss: 0.7792 - val_acc: 0.9048
Epoch 762/800
114/114 - 0s - loss: 0.5097 - acc: 0.9912 - val_loss: 0.7982 - val_acc: 0.9048
Epoch 763/800
114/114 - 0s - loss: 0.5062 - acc: 0.9912 - val_loss: 0.8104 - val_acc: 0.9048
Epoch 764/800
114/114 - 0s - loss: 0.5076 - acc: 1.0000 - val_loss: 0.8193 - val_acc: 0.9048
Epoch 765/800
114/114 - 0s - loss: 0.5279 - acc: 0.9912 - val_loss: 0.7879 - val_acc: 0.9524
Epoch 766/800
114/114 - 0s - loss: 0.5262 - acc: 0.9825 - val_loss: 0.7877 - val_acc: 0.9524
Epoch 767/800
114/114 - 0s - loss: 0.5240 - acc: 0.9912 - val_loss: 0.7979 - val_acc: 0.9048
Epoch 768/800
114/114 - 0s - loss: 0.5275 - acc: 0.9825 - val_loss: 0.8125 - val_acc: 0.9048
Epoch 769/800
114/114 - 0s - loss: 0.5106 - acc: 1.0000 - val_loss: 0.8166 - val_acc: 0.9048
Epoch 770/800
114/114 - 0s - loss: 0.5162 - acc: 0.9912 - val_loss: 0.8152 - val_acc: 0.9048
Epoch 771/800
114/114 - 0s - loss: 0.5428 - acc: 0.9737 - val_loss: 0.8048 - val_acc: 0.9048
Epoch 772/800
114/114 - 0s - loss: 0.5079 - acc: 0.9912 - val_loss: 0.7885 - val_acc: 0.9048
```

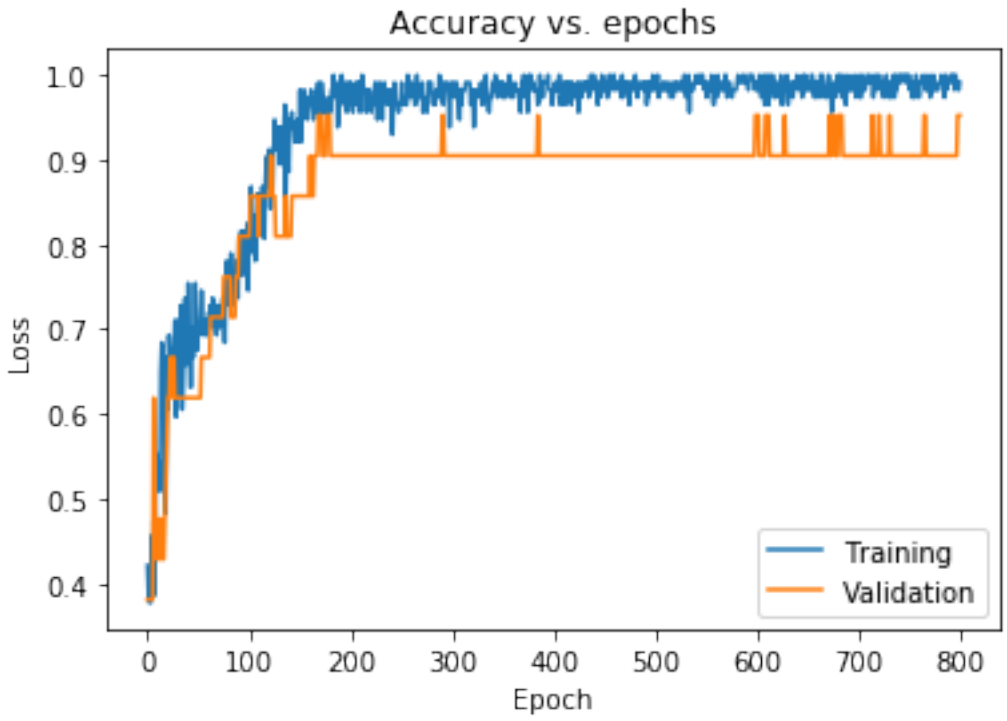
```
Epoch 773/800
114/114 - 0s - loss: 0.5111 - acc: 0.9912 - val_loss: 0.7798 - val_acc: 0.9048
Epoch 774/800
114/114 - 0s - loss: 0.4974 - acc: 1.0000 - val_loss: 0.7702 - val_acc: 0.9048
Epoch 775/800
114/114 - 0s - loss: 0.5245 - acc: 0.9825 - val_loss: 0.7686 - val_acc: 0.9048
Epoch 776/800
114/114 - 0s - loss: 0.5112 - acc: 0.9912 - val_loss: 0.7659 - val_acc: 0.9048
Epoch 777/800
114/114 - 0s - loss: 0.5244 - acc: 0.9825 - val_loss: 0.7661 - val_acc: 0.9048
Epoch 778/800
114/114 - 0s - loss: 0.5537 - acc: 0.9825 - val_loss: 0.7780 - val_acc: 0.9048
Epoch 779/800
114/114 - 0s - loss: 0.5328 - acc: 0.9825 - val_loss: 0.8080 - val_acc: 0.9048
Epoch 780/800
114/114 - 0s - loss: 0.5165 - acc: 0.9912 - val_loss: 0.7940 - val_acc: 0.9048
Epoch 781/800
114/114 - 0s - loss: 0.5262 - acc: 0.9912 - val_loss: 0.7940 - val_acc: 0.9048
Epoch 782/800
114/114 - 0s - loss: 0.5010 - acc: 1.0000 - val_loss: 0.8326 - val_acc: 0.9048
Epoch 783/800
114/114 - 0s - loss: 0.5148 - acc: 0.9912 - val_loss: 0.8416 - val_acc: 0.9048
Epoch 784/800
114/114 - 0s - loss: 0.5101 - acc: 0.9912 - val_loss: 0.8374 - val_acc: 0.9048
Epoch 785/800
114/114 - 0s - loss: 0.5256 - acc: 0.9737 - val_loss: 0.8066 - val_acc: 0.9048
Epoch 786/800
114/114 - 0s - loss: 0.4959 - acc: 1.0000 - val_loss: 0.7703 - val_acc: 0.9048
Epoch 787/800
114/114 - 0s - loss: 0.5748 - acc: 0.9825 - val_loss: 0.7562 - val_acc: 0.9048
Epoch 788/800
114/114 - 0s - loss: 0.5081 - acc: 0.9912 - val_loss: 0.7600 - val_acc: 0.9048
Epoch 789/800
114/114 - 0s - loss: 0.5078 - acc: 0.9912 - val_loss: 0.7378 - val_acc: 0.9048
Epoch 790/800
114/114 - 0s - loss: 0.5065 - acc: 0.9912 - val_loss: 0.7364 - val_acc: 0.9048
Epoch 791/800
114/114 - 0s - loss: 0.4953 - acc: 1.0000 - val_loss: 0.7650 - val_acc: 0.9048
Epoch 792/800
114/114 - 0s - loss: 0.4953 - acc: 1.0000 - val_loss: 0.8010 - val_acc: 0.9048
Epoch 793/800
114/114 - 0s - loss: 0.5039 - acc: 0.9912 - val_loss: 0.8236 - val_acc: 0.9048
Epoch 794/800
114/114 - 0s - loss: 0.4952 - acc: 1.0000 - val_loss: 0.8302 - val_acc: 0.9048
Epoch 795/800
114/114 - 0s - loss: 0.5346 - acc: 0.9825 - val_loss: 0.8114 - val_acc: 0.9048
Epoch 796/800
114/114 - 0s - loss: 0.5000 - acc: 1.0000 - val_loss: 0.7833 - val_acc: 0.9048
```

```
Epoch 797/800
114/114 - 0s - loss: 0.5085 - acc: 0.9912 - val_loss: 0.7421 - val_acc: 0.9048
Epoch 798/800
114/114 - 0s - loss: 0.5070 - acc: 0.9912 - val_loss: 0.7082 - val_acc: 0.9524
Epoch 799/800
114/114 - 0s - loss: 0.5111 - acc: 0.9825 - val_loss: 0.7048 - val_acc: 0.9524
Epoch 800/800
114/114 - 0s - loss: 0.5161 - acc: 0.9912 - val_loss: 0.6934 - val_acc: 0.9524
```

Plot the learning curves Let's now plot the loss and accuracy for the training and validation sets.

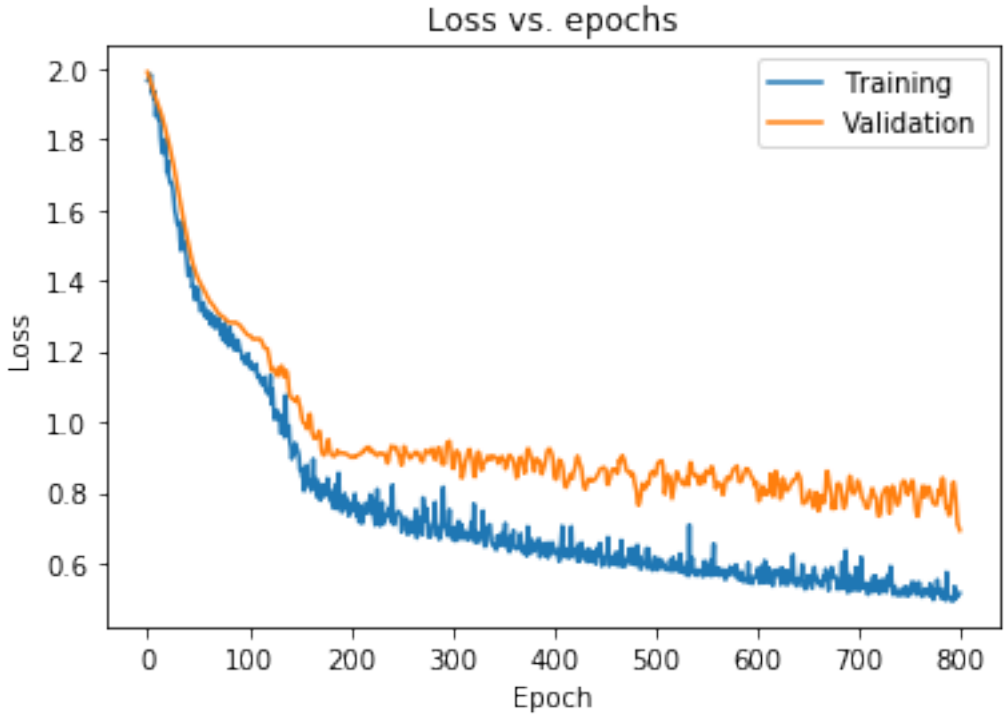
In [64]:
```
#Run this cell to plot the new accuracy vs epoch graph

try:
    plt.plot(reg_history.history['accuracy'])
    plt.plot(reg_history.history['val_accuracy'])
except KeyError:
    plt.plot(reg_history.history['acc'])
    plt.plot(reg_history.history['val_acc'])
plt.title('Accuracy vs. epochs')
plt.ylabel('Loss')
plt.xlabel('Epoch')
plt.legend(['Training', 'Validation'], loc='lower right')
plt.show()
```



In [65]: *#Run this cell to plot the new loss vs epoch graph*

```
plt.plot(reg_history.history['loss'])
plt.plot(reg_history.history['val_loss'])
plt.title('Loss vs. epochs')
plt.ylabel('Loss')
plt.xlabel('Epoch')
plt.legend(['Training', 'Validation'], loc='upper right')
plt.show()
```



We can see that the regularisation has helped to reduce the overfitting of the network. You will now incorporate callbacks into a new training run that implements early stopping and learning rate reduction on plateaux.

Fill in the function below so that:

- It creates an `EarlyStopping` callback object and a `ReduceLROnPlateau` callback object
- The early stopping callback is used and monitors validation loss with the mode set to `"min"` and patience of 30.
- The learning rate reduction on plateaux is used with a learning rate factor of 0.2 and a patience of 20.

In [66]: *#### GRADED CELL ####*

```
# Complete the following function.
# Make sure to not change the function name or arguments.

def get_callbacks():
    """
    This function should create and return a tuple (early_stopping, learning_rate_red
    The callbacks should be instantiated according to the above requirements.
    """
    early_stopping = EarlyStopping(monitor="val_loss", mode="min", patience=30)
    learning_rate_reduction = ReduceLROnPlateau(monitor="val_loss", factor=0.2, patie

    return (early_stopping, learning_rate_reduction)
```

Run the cell below to instantiate and train the regularised model with the callbacks.

```
In [78]: call_model = get_regularised_model(train_data[0].shape, 0.3, 0.0001)
         compile_model(call_model)
         early_stopping, learning_rate_reduction = get_callbacks()
         call_history = call_model.fit(train_data, train_targets, epochs=800, validation_split=
                                       callbacks=[early_stopping, learning_rate_reduction], verbose=
```

```
---------------------------------------------------------------------------

NameError                                 Traceback (most recent call last)

<ipython-input-78-32de4e6f5a09> in <module>
      1 call_model = get_regularised_model(train_data[0].shape, 0.3, 0.0001)
      2 compile_model(call_model)
----> 3 early_stopping, learning_rate_reduction = get_callbacks()
      4 call_history = call_model.fit(train_data, train_targets, epochs=800, validation_spl
      5                               callbacks=[early_stopping, learning_rate_reduction], verbo


<ipython-input-66-0275ee8b78e1> in get_callbacks()
      9     The callbacks should be instantiated according to the above requirements.
     10     """
---> 11     early_stopping = EarlyStopping(monitor="val_loss", mode="min", patience=30)
     12     learning_rate_reduction = ReduceLROnPlateau(monitor="val_loss", factor=0.2, pat
     13


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

```
In [79]: learning_rate_reduction.patience
```

```
---------------------------------------------------------------------------
```

```
NameError                                 Traceback (most recent call last)

<ipython-input-79-b0bb8ed001d2> in <module>
----> 1 learning_rate_reduction.patience


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

Finally, let's replot the accuracy and loss graphs for our new model.

```
In [80]: try:
             plt.plot(call_history.history['accuracy'])
             plt.plot(call_history.history['val_accuracy'])
         except KeyError:
             plt.plot(call_history.history['acc'])
             plt.plot(call_history.history['val_acc'])
         plt.title('Accuracy vs. epochs')
         plt.ylabel('Accuracy')
         plt.xlabel('Epoch')
         plt.legend(['Training', 'Validation'], loc='lower right')
         plt.show()


         ---------------------------------------------------------------------------

         NameError                                 Traceback (most recent call last)

         <ipython-input-80-bdb99119de5c> in <module>
           1 try:
         ----> 2     plt.plot(call_history.history['accuracy'])
           3     plt.plot(call_history.history['val_accuracy'])
           4 except KeyError:
           5     plt.plot(call_history.history['acc'])


         NameError: name 'call_history' is not defined


In [81]: plt.plot(call_history.history['loss'])
         plt.plot(call_history.history['val_loss'])
         plt.title('Loss vs. epochs')
         plt.ylabel('Loss')
         plt.xlabel('Epoch')
         plt.legend(['Training', 'Validation'], loc='upper right')
         plt.show()


         ---------------------------------------------------------------------------
```

```
NameError                                 Traceback (most recent call last)

<ipython-input-81-0e7f43eb943d> in <module>
----> 1 plt.plot(call_history.history['loss'])
      2 plt.plot(call_history.history['val_loss'])
      3 plt.title('Loss vs. epochs')
      4 plt.ylabel('Loss')
      5 plt.xlabel('Epoch')


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

In [82]:
```
# Evaluate the model on the test set

test_loss, test_acc = call_model.evaluate(test_data, test_targets, verbose=0)
print("Test loss: {:.3f}\nTest accuracy: {:.2f}%".format(test_loss, 100 * test_acc))
```

```
Test loss: 1.213
Test accuracy: 26.67%
```

Congratulations for completing this programming assignment! In the next week of the course we will learn how to save and load pre-trained models.