

```
from google.colab import drive
drive.mount('/content/drive')
```

➡ Go to this URL in a browser: https://accounts.google.com/o/oauth2/auth?client_id=9473

Enter your authorization code:

• • • • •

Mounted at /content/drive

```
from keras.layers import Conv2D, MaxPool2D, Dense, Flatten
from keras.layers import Dropout, BatchNormalization, ZeroPadding2D
from keras.models import Sequential
from keras.optimizers import RMSprop, adam
from keras.preprocessing import image
import numpy as np
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
```

➡ Using TensorFlow backend.

The default version of TensorFlow in Colab will soon switch to TensorFlow 2.x.

We recommend you [upgrade](#) now or ensure your notebook will continue to use TensorFlow 1.x via the `%tensorflow version 1.x` magic: [more info](#).

```
def Data_prep():
```

[illegible]

```
channel_shift_range=0.0, fill_mode='nearest',  
cval=0.0, horizontal_flip=True, vertical_flip=True,  
data_format=None, validation_split=0.0, dtype=None)
```

```
val_gen = image.ImageDataGenerator(rescale = 1./255,  
                                   featurewise_center=True,  
                                   samplewise_center=True,  
                                   featurewise_std_normalization=True,  
                                   samplewise_std_normalization=True,  
                                   zca_whitening=False, zca_epsilon=1e-06,  
                                   rotation_range=40, width_shift_range=0.0,  
                                   height_shift_range=0.0, brightness_range=(0.2, 0.2),  
                                   shear_range=0.2, zoom_range=0.2,  
                                   channel_shift_range=0.0, fill_mode='nearest',  
                                   cval=0.0, horizontal_flip=True, vertical_flip=True,  
                                   data_format=None, validation_split=0.0, dtype=None)
```

```
train_dir = train_gen.flow_from_directory(r"/content/drive/My Drive/cars 32/train",  
                                          target_size = (32, 32),  
                                          classes = ['Jeep', 'Maruthi Suzuki Swift'],  
                                          class_mode = 'categorical',  
                                          batch_size = 64,  
                                          seed = 1)
```

```
test_dir = test_gen.flow_from_directory(r"/content/drive/My Drive/cars 32/test",  
                                       target_size = (32, 32),  
                                       classes = ['Jeep', 'Maruthi Suzuki Swift'],  
                                       class_mode = 'categorical',  
                                       batch_size = 64,  
                                       seed = 1)
```

```
val_dir = val_gen.flow_from_directory(r"/content/drive/My Drive/cars 32/val",  
                                     target_size = (32, 32),  
                                     classes = ['Jeep', 'Maruthi Suzuki Swift'],  
                                     class_mode = 'categorical',  
                                     batch_size = 64,  
                                     seed = 1)
```

```
return train_dir, test_dir, val_dir
```

```
def model_creation():
```

```
    model = Sequential()
```

```
    #Conv1
```

```
    model.add(ZeroPadding2D(padding = (2, 2), input_shape= (32, 32, 3)))
```

```
    model.add(Conv2D(8, kernel_size=(3, 3), strides=(1, 1), padding='SAME',  
                    activation = 'relu'))
```

```
    model.add(Conv2D(8, kernel_size=(3, 3), strides=(1, 1), padding='SAME',  
                    activation = 'relu'))
```

```
    model.add(MaxPool2D(pool_size=(2, 2), strides=(1, 1), padding = 'SAME'))
```

```
    model.add(BatchNormalization(axis = -1))
```

```
    model.add(Dropout(0.5))
```

```

#Conv2
model.add(ZeroPadding2D(padding = (2, 2)))
model.add(Conv2D(16, kernel_size=(3, 3), strides=(1, 1), padding='SAME', activation =
model.add(Conv2D(16, kernel_size=(3, 3), strides=(1, 1), padding='SAME',
activation = 'relu'))
model.add(MaxPool2D(pool_size=(2, 2), strides=(1, 1), padding = 'SAME'))
model.add(BatchNormalization(axis = -1))
model.add(Dropout(0.5))
#conv3
model.add(ZeroPadding2D(padding = (2, 2)))
model.add(Conv2D(32, kernel_size=(3, 3), strides=(1, 1), padding='SAME', activation =
model.add(Conv2D(32, kernel_size=(3, 3), strides=(1, 1), padding='SAME',
activation = 'relu'))
model.add(MaxPool2D(pool_size=(2, 2), strides=(1, 1), padding = 'SAME'))
model.add(BatchNormalization(axis = -1))
model.add(Dropout(0.5))

#conv4
model.add(ZeroPadding2D(padding = (2, 2)))
model.add(Conv2D(64, kernel_size=(3, 3), strides=(1, 1), padding='SAME',
activation = 'relu'))
model.add(Conv2D(64, kernel_size=(3, 3), strides=(1, 1), padding='SAME',
activation = 'relu'))
model.add(MaxPool2D(pool_size=(2, 2), strides=(1, 1), padding = 'SAME'))
model.add(BatchNormalization(axis = -1))
model.add(Dropout(0.5))

#conv5
model.add(ZeroPadding2D(padding = (2, 2)))
model.add(Conv2D(128, kernel_size=(3, 3), strides=(1, 1), padding='SAME',
activation = 'relu'))
model.add(Conv2D(128, kernel_size=(3, 3), strides=(1, 1), padding='SAME',
activation = 'relu'))
model.add(MaxPool2D(pool_size=(2, 2), strides=(1, 1), padding = 'SAME'))
model.add(BatchNormalization(axis = -1))
model.add(Dropout(0.5))
#conv6

#conv7

#conv8

#Flatten
model.add(Flatten())

#Dense1
model.add(Dense(128, activation='relu'))
model.add(BatchNormalization(axis = -1))
model.add(Dropout(0.5))

#Dense2
'''model.add(Dense(64, activation='relu'))

```

```

model.add(BatchNormalization(axis = -1))
model.add(Dropout(0.5))'''

#Dense3
model.add(Dense(32, activation='relu'))
model.add(BatchNormalization(axis = -1))
model.add(Dropout(0.5))

#Dense4
model.add(Dense(16, activation='relu'))
model.add(BatchNormalization(axis = -1))
model.add(Dropout(0.5))

#Dense5
model.add(Dense(2, activation='softmax'))

return model

```

```
def train_data(model, train_dir, val_dir):
```

```

#model summary
model.summary()

#Optimizers
Ad = RMSprop(lr = 0.001)
#Compile Model
model.compile(optimizer = Ad,
              loss = 'categorical_crossentropy',
              metrics=['accuracy'])

#Fitting Model
history = model.fit_generator(train_dir, steps_per_epoch=20,
                             epochs=500, validation_data=val_dir,
                             validation_steps=100)
model.save(r'/content/drive/My Drive/Parkzap/weights3.h5')

return history

```

```
def test_data(model, test_dir):
```

```

#Evaluating
score = model.evaluate_generator(test_dir,
                                steps = 20)

#printAccuracy
print("Accuracyloss:-", score[0])

```

```

print("AccuracyScore",score[1] )

return score

def plotting(history):
    print(history.history.keys())
# summarize history for accuracy
    plt.plot(history.history['acc'])
    plt.plot(history.history['val_acc'])
    plt.title('model accuracy')
    plt.ylabel('accuracy')
    plt.xlabel('epoch')
    plt.legend(['train', 'test'], loc='upper left')
    plt.show()
    plt.plot(history.history['loss'])
    plt.plot(history.history['val_loss'])
    plt.title('model loss')
    plt.ylabel('loss')
    plt.xlabel('epoch')
    plt.legend(['train', 'test'], loc='upper left')
    plt.show()

```

```

if __name__ == '__main__':

    data = Data_prep()

    train_dir, test_dir, val_dir = data

    model = model_creation()

    history = train_data(model, train_dir, val_dir)

    test = test_data(model, test_dir)

    plotting(history)

```



WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorfl

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WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorfl

Instructions for updating:
Please use `rate` instead of `keep_prob`. Rate should be set to `rate = 1 - keep_prob`
Model: "sequential_1"

Layer (type)	Output Shape	Param #
=====		
zero_padding2d_1 (ZeroPaddin	(None, 36, 36, 3)	0
conv2d_1 (Conv2D)	(None, 36, 36, 8)	224
conv2d_2 (Conv2D)	(None, 36, 36, 8)	584
max_pooling2d_1 (MaxPooling2	(None, 36, 36, 8)	0
batch_normalization_1 (Batch	(None, 36, 36, 8)	32
dropout_1 (Dropout)	(None, 36, 36, 8)	0
zero_padding2d_2 (ZeroPaddin	(None, 40, 40, 8)	0
conv2d_3 (Conv2D)	(None, 40, 40, 16)	1168
conv2d_4 (Conv2D)	(None, 40, 40, 16)	2320
max_pooling2d_2 (MaxPooling2	(None, 40, 40, 16)	0
batch_normalization_2 (Batch	(None, 40, 40, 16)	64
dropout_2 (Dropout)	(None, 40, 40, 16)	0
zero_padding2d_3 (ZeroPaddin	(None, 44, 44, 16)	0
conv2d_5 (Conv2D)	(None, 44, 44, 32)	4640
conv2d_6 (Conv2D)	(None, 44, 44, 32)	9248
max_pooling2d_3 (MaxPooling2	(None, 44, 44, 32)	0
batch_normalization_3 (Batch	(None, 44, 44, 32)	128
dropout_3 (Dropout)	(None, 44, 44, 32)	0
zero_padding2d_4 (ZeroPaddin	(None, 48, 48, 32)	0
conv2d_7 (Conv2D)	(None, 48, 48, 64)	18496

conv2d_8 (Conv2D)	(None, 48, 48, 64)	36928
max_pooling2d_4 (MaxPooling2D)	(None, 48, 48, 64)	0
batch_normalization_4 (Batch Normalization)	(None, 48, 48, 64)	256
dropout_4 (Dropout)	(None, 48, 48, 64)	0
flatten_1 (Flatten)	(None, 147456)	0
dense_1 (Dense)	(None, 32)	4718624
batch_normalization_5 (Batch Normalization)	(None, 32)	128
dropout_5 (Dropout)	(None, 32)	0
dense_2 (Dense)	(None, 16)	528
batch_normalization_6 (Batch Normalization)	(None, 16)	64
dropout_6 (Dropout)	(None, 16)	0
dense_3 (Dense)	(None, 2)	34
=====		
Total params: 4,793,466		
Trainable params: 4,793,130		
Non-trainable params: 336		

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/optimizers.py:79

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorfl

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow_core/python
Instructions for updating:

Use tf.where in 2.0, which has the same broadcast rule as np.where

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorfl

WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorfl

Epoch 1/500

20/20 [=====] - 15s 751ms/step - loss: 1.1031 - acc: 0.5045

Epoch 2/500

20/20 [=====] - 12s 623ms/step - loss: 0.9729 - acc: 0.5365

Epoch 3/500

20/20 [=====] - 12s 624ms/step - loss: 0.8935 - acc: 0.5658

Epoch 4/500

20/20 [=====] - 12s 615ms/step - loss: 0.8563 - acc: 0.5625

Epoch 5/500

20/20 [=====] - 12s 611ms/step - loss: 0.8789 - acc: 0.5588

Epoch 6/500

20/20 [=====] - 12s 614ms/step - loss: 0.7816 - acc: 0.5790

Epoch 7/500

20/20 [=====] - 11s 573ms/step - loss: 0.7533 - acc: 0.5900

Epoch 8/500

20/20 [=====] - 13s 634ms/step - loss: 0.7306 - acc: 0.5950

Epoch 9/500

20/20 [=====] - 12s 623ms/step - loss: 0.7688 - acc: 0.5850

Epoch 10/500

20/20 [=====] - 12s 608ms/step - loss: 0.7640 - acc: 0.5992

Epoch 11/500

20/20 [=====] - 12s 613ms/step - loss: 0.6966 - acc: 0.6259

```
20/20 [-----] - 12s 613ms/step - loss: 0.6500 - acc: 0.6250
Epoch 12/500
20/20 [=====] - 12s 603ms/step - loss: 0.7109 - acc: 0.6310
Epoch 13/500
20/20 [=====] - 12s 578ms/step - loss: 0.6514 - acc: 0.6309
Epoch 14/500
20/20 [=====] - 13s 638ms/step - loss: 0.6419 - acc: 0.6695
Epoch 15/500
20/20 [=====] - 13s 637ms/step - loss: 0.6594 - acc: 0.6700
Epoch 16/500
20/20 [=====] - 12s 610ms/step - loss: 0.6574 - acc: 0.6662
Epoch 17/500
20/20 [=====] - 12s 603ms/step - loss: 0.6178 - acc: 0.6881
Epoch 18/500
20/20 [=====] - 12s 595ms/step - loss: 0.6091 - acc: 0.6860
Epoch 19/500
20/20 [=====] - 12s 582ms/step - loss: 0.5863 - acc: 0.7001
Epoch 20/500
20/20 [=====] - 12s 623ms/step - loss: 0.6224 - acc: 0.6837
Epoch 21/500
20/20 [=====] - 12s 614ms/step - loss: 0.5946 - acc: 0.7049
Epoch 22/500
20/20 [=====] - 12s 603ms/step - loss: 0.5850 - acc: 0.7095
Epoch 23/500
20/20 [=====] - 12s 608ms/step - loss: 0.5738 - acc: 0.7099
Epoch 24/500
20/20 [=====] - 13s 634ms/step - loss: 0.5807 - acc: 0.6961
Epoch 25/500
20/20 [=====] - 11s 574ms/step - loss: 0.5577 - acc: 0.7268
Epoch 26/500
20/20 [=====] - 13s 628ms/step - loss: 0.5584 - acc: 0.7437
Epoch 27/500
20/20 [=====] - 12s 618ms/step - loss: 0.5686 - acc: 0.7281
Epoch 28/500
20/20 [=====] - 12s 605ms/step - loss: 0.5655 - acc: 0.7256
Epoch 29/500
20/20 [=====] - 12s 604ms/step - loss: 0.5462 - acc: 0.7371
Epoch 30/500
20/20 [=====] - 12s 614ms/step - loss: 0.5455 - acc: 0.7236
Epoch 31/500
20/20 [=====] - 12s 579ms/step - loss: 0.5551 - acc: 0.7461
Epoch 32/500
20/20 [=====] - 13s 627ms/step - loss: 0.5449 - acc: 0.7334
Epoch 33/500
20/20 [=====] - 13s 629ms/step - loss: 0.5408 - acc: 0.7422
Epoch 34/500
20/20 [=====] - 12s 609ms/step - loss: 0.5464 - acc: 0.7440
Epoch 35/500
20/20 [=====] - 12s 608ms/step - loss: 0.5309 - acc: 0.7545
Epoch 36/500
20/20 [=====] - 12s 609ms/step - loss: 0.5269 - acc: 0.7513
Epoch 37/500
20/20 [=====] - 12s 577ms/step - loss: 0.5160 - acc: 0.7614
Epoch 38/500
20/20 [=====] - 13s 638ms/step - loss: 0.5383 - acc: 0.7552
Epoch 39/500
20/20 [=====] - 12s 619ms/step - loss: 0.5110 - acc: 0.7563
Epoch 40/500
20/20 [=====] - 12s 620ms/step - loss: 0.5200 - acc: 0.7540
Epoch 41/500
20/20 [=====] - 12s 622ms/step - loss: 0.4937 - acc: 0.7648
Epoch 42/500
```


20/20 [=====] - 12s 614ms/step - loss: 0.5347 - acc: 0.7548
Epoch 43/500
20/20 [=====] - 12s 582ms/step - loss: 0.5025 - acc: 0.7656
Epoch 44/500
20/20 [=====] - 13s 633ms/step - loss: 0.5056 - acc: 0.7703
Epoch 45/500
20/20 [=====] - 12s 618ms/step - loss: 0.5018 - acc: 0.7695
Epoch 46/500
20/20 [=====] - 12s 603ms/step - loss: 0.5031 - acc: 0.7623
Epoch 47/500
20/20 [=====] - 12s 613ms/step - loss: 0.5101 - acc: 0.7630
Epoch 48/500
20/20 [=====] - 12s 609ms/step - loss: 0.4986 - acc: 0.7641
Epoch 49/500
20/20 [=====] - 11s 574ms/step - loss: 0.4893 - acc: 0.7820
Epoch 50/500
20/20 [=====] - 13s 628ms/step - loss: 0.5182 - acc: 0.7650
Epoch 51/500
20/20 [=====] - 12s 618ms/step - loss: 0.4968 - acc: 0.7621
Epoch 52/500
20/20 [=====] - 12s 603ms/step - loss: 0.4773 - acc: 0.7793
Epoch 53/500
20/20 [=====] - 12s 613ms/step - loss: 0.4945 - acc: 0.7781
Epoch 54/500
20/20 [=====] - 12s 608ms/step - loss: 0.4878 - acc: 0.7696
Epoch 55/500
20/20 [=====] - 12s 578ms/step - loss: 0.4768 - acc: 0.7930
Epoch 56/500
20/20 [=====] - 12s 623ms/step - loss: 0.4921 - acc: 0.7794
Epoch 57/500
20/20 [=====] - 13s 629ms/step - loss: 0.4913 - acc: 0.7805
Epoch 58/500
20/20 [=====] - 12s 607ms/step - loss: 0.4822 - acc: 0.7852
Epoch 59/500
20/20 [=====] - 12s 614ms/step - loss: 0.4760 - acc: 0.7891
Epoch 60/500
20/20 [=====] - 12s 609ms/step - loss: 0.4709 - acc: 0.7880
Epoch 61/500
20/20 [=====] - 11s 573ms/step - loss: 0.4802 - acc: 0.7951
Epoch 62/500
20/20 [=====] - 12s 624ms/step - loss: 0.4601 - acc: 0.8001
Epoch 63/500
20/20 [=====] - 13s 629ms/step - loss: 0.4646 - acc: 0.7907
Epoch 64/500
20/20 [=====] - 12s 608ms/step - loss: 0.4728 - acc: 0.7785
Epoch 65/500
20/20 [=====] - 12s 613ms/step - loss: 0.4951 - acc: 0.7867
Epoch 66/500
20/20 [=====] - 12s 620ms/step - loss: 0.4799 - acc: 0.7724
Epoch 67/500
20/20 [=====] - 11s 572ms/step - loss: 0.4647 - acc: 0.7879
Epoch 68/500
20/20 [=====] - 13s 638ms/step - loss: 0.4558 - acc: 0.7895
Epoch 69/500
20/20 [=====] - 12s 619ms/step - loss: 0.4481 - acc: 0.8000
Epoch 70/500
20/20 [=====] - 12s 613ms/step - loss: 0.4904 - acc: 0.7798
Epoch 71/500
20/20 [=====] - 12s 603ms/step - loss: 0.4765 - acc: 0.7720
Epoch 72/500
20/20 [=====] - 12s 603ms/step - loss: 0.4718 - acc: 0.7996
Epoch 73/500

Epoch 73/500
20/20 [=====] - 11s 574ms/step - loss: 0.4784 - acc: 0.7950
Epoch 74/500
20/20 [=====] - 13s 625ms/step - loss: 0.4737 - acc: 0.8008
Epoch 75/500
20/20 [=====] - 13s 626ms/step - loss: 0.4625 - acc: 0.7923
Epoch 76/500
20/20 [=====] - 12s 608ms/step - loss: 0.4327 - acc: 0.8088
Epoch 77/500
20/20 [=====] - 12s 603ms/step - loss: 0.4885 - acc: 0.7898
Epoch 78/500
20/20 [=====] - 12s 613ms/step - loss: 0.4697 - acc: 0.7914
Epoch 79/500
20/20 [=====] - 12s 575ms/step - loss: 0.4610 - acc: 0.7978
Epoch 80/500
20/20 [=====] - 12s 622ms/step - loss: 0.4432 - acc: 0.8109
Epoch 81/500
20/20 [=====] - 12s 618ms/step - loss: 0.4575 - acc: 0.7938
Epoch 82/500
20/20 [=====] - 12s 609ms/step - loss: 0.4656 - acc: 0.7854
Epoch 83/500
20/20 [=====] - 12s 609ms/step - loss: 0.4589 - acc: 0.8039
Epoch 84/500
20/20 [=====] - 12s 612ms/step - loss: 0.4465 - acc: 0.8017
Epoch 85/500
20/20 [=====] - 11s 573ms/step - loss: 0.4548 - acc: 0.8079
Epoch 86/500
20/20 [=====] - 13s 628ms/step - loss: 0.4632 - acc: 0.7927
Epoch 87/500
20/20 [=====] - 12s 624ms/step - loss: 0.4343 - acc: 0.8158
Epoch 88/500
20/20 [=====] - 12s 608ms/step - loss: 0.4466 - acc: 0.7969
Epoch 89/500
20/20 [=====] - 12s 609ms/step - loss: 0.4744 - acc: 0.7903
Epoch 90/500
20/20 [=====] - 12s 607ms/step - loss: 0.4476 - acc: 0.8115
Epoch 91/500
20/20 [=====] - 11s 574ms/step - loss: 0.4532 - acc: 0.7935
Epoch 92/500
20/20 [=====] - 13s 653ms/step - loss: 0.4636 - acc: 0.7914
Epoch 93/500
20/20 [=====] - 12s 618ms/step - loss: 0.4450 - acc: 0.7981
Epoch 94/500
20/20 [=====] - 12s 610ms/step - loss: 0.4479 - acc: 0.8022
Epoch 95/500
20/20 [=====] - 12s 609ms/step - loss: 0.4653 - acc: 0.7937
Epoch 96/500
20/20 [=====] - 12s 603ms/step - loss: 0.4424 - acc: 0.8091
Epoch 97/500
20/20 [=====] - 12s 584ms/step - loss: 0.4640 - acc: 0.7985
Epoch 98/500
20/20 [=====] - 13s 627ms/step - loss: 0.4348 - acc: 0.8242
Epoch 99/500
20/20 [=====] - 13s 630ms/step - loss: 0.4504 - acc: 0.8096
Epoch 100/500
20/20 [=====] - 12s 607ms/step - loss: 0.4257 - acc: 0.8141
Epoch 101/500
20/20 [=====] - 12s 616ms/step - loss: 0.4376 - acc: 0.8027
Epoch 102/500
20/20 [=====] - 12s 617ms/step - loss: 0.4498 - acc: 0.7924
Epoch 103/500
20/20 [=====] - 12s 579ms/step - loss: 0.4417 - acc: 0.8021

```
Epoch 104/500
20/20 [=====] - 13s 634ms/step - loss: 0.4235 - acc: 0.8251
Epoch 105/500
20/20 [=====] - 12s 618ms/step - loss: 0.4560 - acc: 0.7977
Epoch 106/500
20/20 [=====] - 12s 606ms/step - loss: 0.4481 - acc: 0.8048
Epoch 107/500
20/20 [=====] - 12s 611ms/step - loss: 0.4510 - acc: 0.8072
Epoch 108/500
20/20 [=====] - 12s 609ms/step - loss: 0.4347 - acc: 0.8125
Epoch 109/500
20/20 [=====] - 11s 574ms/step - loss: 0.4427 - acc: 0.7997
Epoch 110/500
20/20 [=====] - 13s 633ms/step - loss: 0.4319 - acc: 0.8038
Epoch 111/500
20/20 [=====] - 12s 618ms/step - loss: 0.4200 - acc: 0.8141
Epoch 112/500
20/20 [=====] - 12s 614ms/step - loss: 0.4444 - acc: 0.8099
Epoch 113/500
20/20 [=====] - 12s 613ms/step - loss: 0.4509 - acc: 0.8133
Epoch 114/500
20/20 [=====] - 12s 599ms/step - loss: 0.4551 - acc: 0.8063
Epoch 115/500
20/20 [=====] - 11s 572ms/step - loss: 0.4327 - acc: 0.8084
Epoch 116/500
20/20 [=====] - 13s 639ms/step - loss: 0.4246 - acc: 0.8086
Epoch 117/500
20/20 [=====] - 13s 644ms/step - loss: 0.4230 - acc: 0.8091
Epoch 118/500
20/20 [=====] - 12s 613ms/step - loss: 0.4319 - acc: 0.8170
Epoch 119/500
20/20 [=====] - 12s 598ms/step - loss: 0.4102 - acc: 0.8313
Epoch 120/500
20/20 [=====] - 12s 603ms/step - loss: 0.4478 - acc: 0.8129
Epoch 121/500
20/20 [=====] - 11s 575ms/step - loss: 0.4115 - acc: 0.8193
Epoch 122/500
20/20 [=====] - 13s 628ms/step - loss: 0.4448 - acc: 0.8111
Epoch 123/500
20/20 [=====] - 13s 628ms/step - loss: 0.4174 - acc: 0.8169
Epoch 124/500
20/20 [=====] - 12s 609ms/step - loss: 0.4354 - acc: 0.8109
Epoch 125/500
20/20 [=====] - 12s 609ms/step - loss: 0.4459 - acc: 0.8006
Epoch 126/500
20/20 [=====] - 12s 609ms/step - loss: 0.4379 - acc: 0.8078
Epoch 127/500
20/20 [=====] - 12s 589ms/step - loss: 0.4051 - acc: 0.8251
Epoch 128/500
20/20 [=====] - 13s 636ms/step - loss: 0.4561 - acc: 0.8021
Epoch 129/500
20/20 [=====] - 13s 633ms/step - loss: 0.4137 - acc: 0.8227
Epoch 130/500
20/20 [=====] - 12s 609ms/step - loss: 0.3978 - acc: 0.8256
Epoch 131/500
20/20 [=====] - 12s 603ms/step - loss: 0.4334 - acc: 0.8168
Epoch 132/500
20/20 [=====] - 12s 609ms/step - loss: 0.4296 - acc: 0.8075
Epoch 133/500
20/20 [=====] - 11s 573ms/step - loss: 0.4090 - acc: 0.8257
Epoch 134/500
20/20 [=====] - 12s 623ms/step - loss: 0.4360 - acc: 0.8227
```

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Epoch 135/500
20/20 [=====] - 12s 617ms/step - loss: 0.4012 - acc: 0.8361
Epoch 136/500
20/20 [=====] - 12s 614ms/step - loss: 0.4232 - acc: 0.8083
Epoch 137/500
20/20 [=====] - 12s 609ms/step - loss: 0.4213 - acc: 0.8211
Epoch 138/500
20/20 [=====] - 12s 604ms/step - loss: 0.4101 - acc: 0.8289
Epoch 139/500
20/20 [=====] - 11s 573ms/step - loss: 0.3967 - acc: 0.8219
Epoch 140/500
20/20 [=====] - 13s 627ms/step - loss: 0.4017 - acc: 0.8263
Epoch 141/500
20/20 [=====] - 12s 623ms/step - loss: 0.4545 - acc: 0.8087
Epoch 142/500
20/20 [=====] - 13s 630ms/step - loss: 0.4123 - acc: 0.8223
Epoch 143/500
20/20 [=====] - 12s 617ms/step - loss: 0.4029 - acc: 0.8266
Epoch 144/500
20/20 [=====] - 12s 608ms/step - loss: 0.4215 - acc: 0.8162
Epoch 145/500
20/20 [=====] - 11s 573ms/step - loss: 0.4043 - acc: 0.8309
Epoch 146/500
20/20 [=====] - 13s 625ms/step - loss: 0.4000 - acc: 0.8196
Epoch 147/500
20/20 [=====] - 13s 631ms/step - loss: 0.4511 - acc: 0.8047
Epoch 148/500
20/20 [=====] - 12s 608ms/step - loss: 0.4346 - acc: 0.8126
Epoch 149/500
20/20 [=====] - 12s 619ms/step - loss: 0.4116 - acc: 0.8220
Epoch 150/500
20/20 [=====] - 13s 628ms/step - loss: 0.4137 - acc: 0.8154
Epoch 151/500
20/20 [=====] - 12s 582ms/step - loss: 0.4126 - acc: 0.8204
Epoch 152/500
20/20 [=====] - 13s 628ms/step - loss: 0.3710 - acc: 0.8430
Epoch 153/500
20/20 [=====] - 12s 624ms/step - loss: 0.4241 - acc: 0.8133
Epoch 154/500
20/20 [=====] - 12s 607ms/step - loss: 0.4067 - acc: 0.8301
Epoch 155/500
20/20 [=====] - 12s 610ms/step - loss: 0.3912 - acc: 0.8368
Epoch 156/500
20/20 [=====] - 12s 614ms/step - loss: 0.3929 - acc: 0.8382
Epoch 157/500
20/20 [=====] - 12s 577ms/step - loss: 0.3984 - acc: 0.8262
Epoch 158/500
20/20 [=====] - 12s 623ms/step - loss: 0.4080 - acc: 0.8251
Epoch 159/500
20/20 [=====] - 12s 623ms/step - loss: 0.4085 - acc: 0.8219
Epoch 160/500
20/20 [=====] - 12s 603ms/step - loss: 0.3900 - acc: 0.8376
Epoch 161/500
20/20 [=====] - 12s 609ms/step - loss: 0.4162 - acc: 0.8208
Epoch 162/500
20/20 [=====] - 12s 612ms/step - loss: 0.4151 - acc: 0.8076
Epoch 163/500
20/20 [=====] - 11s 574ms/step - loss: 0.3952 - acc: 0.8485
Epoch 164/500
20/20 [=====] - 13s 627ms/step - loss: 0.3973 - acc: 0.8239
Epoch 165/500
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20/20 [=====] - 12s 624ms/step - loss: 0.3936 - acc: 0.8270
Epoch 166/500
20/20 [=====] - 12s 613ms/step - loss: 0.3964 - acc: 0.8359
Epoch 167/500
20/20 [=====] - 12s 613ms/step - loss: 0.3838 - acc: 0.8352
Epoch 168/500
20/20 [=====] - 13s 634ms/step - loss: 0.4136 - acc: 0.8219
Epoch 169/500
20/20 [=====] - 12s 579ms/step - loss: 0.3888 - acc: 0.8320
Epoch 170/500
20/20 [=====] - 13s 638ms/step - loss: 0.3848 - acc: 0.8367
Epoch 171/500
20/20 [=====] - 13s 629ms/step - loss: 0.4136 - acc: 0.8223
Epoch 172/500
20/20 [=====] - 12s 613ms/step - loss: 0.4019 - acc: 0.8317
Epoch 173/500
20/20 [=====] - 12s 615ms/step - loss: 0.3757 - acc: 0.8305
Epoch 174/500
20/20 [=====] - 12s 623ms/step - loss: 0.3973 - acc: 0.8336
Epoch 175/500
20/20 [=====] - 12s 584ms/step - loss: 0.3905 - acc: 0.8375
Epoch 176/500
20/20 [=====] - 13s 639ms/step - loss: 0.3799 - acc: 0.8411
Epoch 177/500
20/20 [=====] - 12s 622ms/step - loss: 0.4080 - acc: 0.8272
Epoch 178/500
20/20 [=====] - 12s 618ms/step - loss: 0.3919 - acc: 0.8367
Epoch 179/500
20/20 [=====] - 12s 609ms/step - loss: 0.4277 - acc: 0.8064
Epoch 180/500
20/20 [=====] - 12s 609ms/step - loss: 0.3887 - acc: 0.8213
Epoch 181/500
20/20 [=====] - 12s 593ms/step - loss: 0.3879 - acc: 0.8330
Epoch 182/500
20/20 [=====] - 13s 633ms/step - loss: 0.3653 - acc: 0.8415
Epoch 183/500
20/20 [=====] - 13s 633ms/step - loss: 0.4275 - acc: 0.8103
Epoch 184/500
20/20 [=====] - 12s 609ms/step - loss: 0.3784 - acc: 0.8406
Epoch 185/500
20/20 [=====] - 12s 615ms/step - loss: 0.4057 - acc: 0.8185
Epoch 186/500
20/20 [=====] - 13s 627ms/step - loss: 0.3932 - acc: 0.8340
Epoch 187/500
20/20 [=====] - 12s 579ms/step - loss: 0.3748 - acc: 0.8352
Epoch 188/500
20/20 [=====] - 13s 633ms/step - loss: 0.3801 - acc: 0.8309
Epoch 189/500
20/20 [=====] - 13s 629ms/step - loss: 0.3901 - acc: 0.8375
Epoch 190/500
20/20 [=====] - 12s 613ms/step - loss: 0.3951 - acc: 0.8227
Epoch 191/500
20/20 [=====] - 12s 613ms/step - loss: 0.3946 - acc: 0.8231
Epoch 192/500
20/20 [=====] - 12s 604ms/step - loss: 0.3696 - acc: 0.8360
Epoch 193/500
20/20 [=====] - 12s 605ms/step - loss: 0.3639 - acc: 0.8447
Epoch 194/500
20/20 [=====] - 13s 632ms/step - loss: 0.3741 - acc: 0.8282
Epoch 195/500
20/20 [=====] - 13s 633ms/step - loss: 0.3791 - acc: 0.8328
Epoch 196/500

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20/20 [=====] - 12s 609ms/step - loss: 0.4004 - acc: 0.8369
Epoch 197/500
20/20 [=====] - 12s 608ms/step - loss: 0.3759 - acc: 0.8414
Epoch 198/500
20/20 [=====] - 12s 609ms/step - loss: 0.3830 - acc: 0.8281
Epoch 199/500
20/20 [=====] - 12s 582ms/step - loss: 0.3814 - acc: 0.8395
Epoch 200/500
20/20 [=====] - 13s 628ms/step - loss: 0.3818 - acc: 0.8322
Epoch 201/500
20/20 [=====] - 12s 624ms/step - loss: 0.3672 - acc: 0.8469
Epoch 202/500
20/20 [=====] - 12s 609ms/step - loss: 0.3752 - acc: 0.8367
Epoch 203/500
20/20 [=====] - 12s 608ms/step - loss: 0.3686 - acc: 0.8586
Epoch 204/500
20/20 [=====] - 12s 611ms/step - loss: 0.3823 - acc: 0.8391
Epoch 205/500
20/20 [=====] - 12s 584ms/step - loss: 0.3860 - acc: 0.8305
Epoch 206/500
20/20 [=====] - 12s 619ms/step - loss: 0.3477 - acc: 0.8478
Epoch 207/500
20/20 [=====] - 12s 617ms/step - loss: 0.3903 - acc: 0.8266
Epoch 208/500
20/20 [=====] - 12s 615ms/step - loss: 0.3608 - acc: 0.8400
Epoch 209/500
20/20 [=====] - 12s 614ms/step - loss: 0.3936 - acc: 0.8242
Epoch 210/500
20/20 [=====] - 12s 603ms/step - loss: 0.3780 - acc: 0.8424
Epoch 211/500
20/20 [=====] - 11s 574ms/step - loss: 0.3599 - acc: 0.8490
Epoch 212/500
20/20 [=====] - 12s 623ms/step - loss: 0.3700 - acc: 0.8493
Epoch 213/500
20/20 [=====] - 12s 623ms/step - loss: 0.3743 - acc: 0.8477
Epoch 214/500
20/20 [=====] - 12s 608ms/step - loss: 0.3746 - acc: 0.8403
Epoch 215/500
20/20 [=====] - 12s 609ms/step - loss: 0.3821 - acc: 0.8406
Epoch 216/500
20/20 [=====] - 12s 613ms/step - loss: 0.4026 - acc: 0.8321
Epoch 217/500
20/20 [=====] - 11s 574ms/step - loss: 0.3755 - acc: 0.8348
Epoch 218/500
20/20 [=====] - 13s 644ms/step - loss: 0.3846 - acc: 0.8380
Epoch 219/500
20/20 [=====] - 13s 652ms/step - loss: 0.3618 - acc: 0.8406
Epoch 220/500
20/20 [=====] - 12s 621ms/step - loss: 0.3933 - acc: 0.8230
Epoch 221/500
20/20 [=====] - 12s 607ms/step - loss: 0.3555 - acc: 0.8591
Epoch 222/500
20/20 [=====] - 12s 618ms/step - loss: 0.3750 - acc: 0.8540
Epoch 223/500
20/20 [=====] - 11s 573ms/step - loss: 0.3597 - acc: 0.8578
Epoch 224/500
20/20 [=====] - 13s 635ms/step - loss: 0.3626 - acc: 0.8559
Epoch 225/500
20/20 [=====] - 13s 632ms/step - loss: 0.3709 - acc: 0.8493
Epoch 226/500
20/20 [=====] - 12s 609ms/step - loss: 0.3755 - acc: 0.8531
Epoch 227/500
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Epoch 227/500
20/20 [=====] - 12s 614ms/step - loss: 0.3522 - acc: 0.8505
Epoch 228/500
20/20 [=====] - 12s 609ms/step - loss: 0.3904 - acc: 0.8318
Epoch 229/500
20/20 [=====] - 12s 578ms/step - loss: 0.3454 - acc: 0.8555
Epoch 230/500
20/20 [=====] - 13s 638ms/step - loss: 0.3776 - acc: 0.8434
Epoch 231/500
20/20 [=====] - 12s 623ms/step - loss: 0.3858 - acc: 0.8375
Epoch 232/500
20/20 [=====] - 12s 613ms/step - loss: 0.3385 - acc: 0.8559
Epoch 233/500
20/20 [=====] - 12s 608ms/step - loss: 0.3764 - acc: 0.8445
Epoch 234/500
20/20 [=====] - 12s 609ms/step - loss: 0.3563 - acc: 0.8528
Epoch 235/500
20/20 [=====] - 12s 589ms/step - loss: 0.3684 - acc: 0.8375
Epoch 236/500
20/20 [=====] - 13s 632ms/step - loss: 0.3605 - acc: 0.8555
Epoch 237/500
20/20 [=====] - 13s 629ms/step - loss: 0.3635 - acc: 0.8392
Epoch 238/500
20/20 [=====] - 12s 609ms/step - loss: 0.3500 - acc: 0.8508
Epoch 239/500
20/20 [=====] - 12s 613ms/step - loss: 0.3419 - acc: 0.8630
Epoch 240/500
20/20 [=====] - 12s 604ms/step - loss: 0.3606 - acc: 0.8383
Epoch 241/500
20/20 [=====] - 12s 578ms/step - loss: 0.3588 - acc: 0.8529
Epoch 242/500
20/20 [=====] - 13s 632ms/step - loss: 0.3446 - acc: 0.8617
Epoch 243/500
20/20 [=====] - 12s 625ms/step - loss: 0.3709 - acc: 0.8469
Epoch 244/500
20/20 [=====] - 13s 643ms/step - loss: 0.3550 - acc: 0.8528
Epoch 245/500
20/20 [=====] - 12s 609ms/step - loss: 0.4031 - acc: 0.8167
Epoch 246/500
20/20 [=====] - 12s 603ms/step - loss: 0.3547 - acc: 0.8477
Epoch 247/500
20/20 [=====] - 12s 583ms/step - loss: 0.3467 - acc: 0.8609
Epoch 248/500
20/20 [=====] - 13s 633ms/step - loss: 0.3618 - acc: 0.8470
Epoch 249/500
20/20 [=====] - 13s 633ms/step - loss: 0.3411 - acc: 0.8609
Epoch 250/500
20/20 [=====] - 12s 609ms/step - loss: 0.3409 - acc: 0.8513
Epoch 251/500
20/20 [=====] - 12s 609ms/step - loss: 0.3651 - acc: 0.8407
Epoch 252/500
20/20 [=====] - 12s 608ms/step - loss: 0.3630 - acc: 0.8461
Epoch 253/500
20/20 [=====] - 12s 580ms/step - loss: 0.3687 - acc: 0.8367
Epoch 254/500
20/20 [=====] - 13s 637ms/step - loss: 0.3493 - acc: 0.8446
Epoch 255/500
20/20 [=====] - 13s 629ms/step - loss: 0.3706 - acc: 0.8441
Epoch 256/500
20/20 [=====] - 12s 604ms/step - loss: 0.3374 - acc: 0.8531
Epoch 257/500
20/20 [=====] - 12s 613ms/step - loss: 0.4004 - acc: 0.8176

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Epoch 258/500
20/20 [=====] - 12s 604ms/step - loss: 0.3502 - acc: 0.8629
Epoch 259/500
20/20 [=====] - 12s 583ms/step - loss: 0.3711 - acc: 0.8302
Epoch 260/500
20/20 [=====] - 13s 638ms/step - loss: 0.3470 - acc: 0.8516
Epoch 261/500
20/20 [=====] - 12s 623ms/step - loss: 0.3511 - acc: 0.8590
Epoch 262/500
20/20 [=====] - 12s 614ms/step - loss: 0.3519 - acc: 0.8422
Epoch 263/500
20/20 [=====] - 12s 614ms/step - loss: 0.3506 - acc: 0.8544
Epoch 264/500
20/20 [=====] - 12s 619ms/step - loss: 0.3634 - acc: 0.8492
Epoch 265/500
20/20 [=====] - 12s 589ms/step - loss: 0.3628 - acc: 0.8406
Epoch 266/500
20/20 [=====] - 13s 638ms/step - loss: 0.3479 - acc: 0.8518
Epoch 267/500
20/20 [=====] - 12s 623ms/step - loss: 0.3380 - acc: 0.8656
Epoch 268/500
20/20 [=====] - 12s 613ms/step - loss: 0.3560 - acc: 0.8531
Epoch 269/500
20/20 [=====] - 13s 645ms/step - loss: 0.3522 - acc: 0.8578
Epoch 270/500
20/20 [=====] - 12s 607ms/step - loss: 0.3401 - acc: 0.8572
Epoch 271/500
20/20 [=====] - 12s 583ms/step - loss: 0.3534 - acc: 0.8587
Epoch 272/500
20/20 [=====] - 13s 633ms/step - loss: 0.3436 - acc: 0.8583
Epoch 273/500
20/20 [=====] - 13s 628ms/step - loss: 0.3517 - acc: 0.8516
Epoch 274/500
20/20 [=====] - 13s 628ms/step - loss: 0.3413 - acc: 0.8525
Epoch 275/500
20/20 [=====] - 12s 613ms/step - loss: 0.3473 - acc: 0.8570
Epoch 276/500
20/20 [=====] - 12s 609ms/step - loss: 0.3521 - acc: 0.8507
Epoch 277/500
20/20 [=====] - 12s 578ms/step - loss: 0.3432 - acc: 0.8465
Epoch 278/500
20/20 [=====] - 13s 634ms/step - loss: 0.3437 - acc: 0.8672
Epoch 279/500
20/20 [=====] - 13s 633ms/step - loss: 0.3491 - acc: 0.8500
Epoch 280/500
20/20 [=====] - 12s 603ms/step - loss: 0.3511 - acc: 0.8582
Epoch 281/500
20/20 [=====] - 12s 608ms/step - loss: 0.3318 - acc: 0.8630
Epoch 282/500
20/20 [=====] - 12s 609ms/step - loss: 0.3809 - acc: 0.8373
Epoch 283/500
20/20 [=====] - 12s 582ms/step - loss: 0.3352 - acc: 0.8638
Epoch 284/500
20/20 [=====] - 13s 633ms/step - loss: 0.3579 - acc: 0.8500
Epoch 285/500
20/20 [=====] - 12s 624ms/step - loss: 0.3582 - acc: 0.8516
Epoch 286/500
20/20 [=====] - 12s 614ms/step - loss: 0.3232 - acc: 0.8673
Epoch 287/500
20/20 [=====] - 12s 618ms/step - loss: 0.3682 - acc: 0.8435
Epoch 288/500
20/20 [=====] - 12s 600ms/step - loss: 0.3307 - acc: 0.8604
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20/20 [=====] - 12s 609ms/step - loss: 0.3387 - acc: 0.8684
Epoch 289/500
20/20 [=====] - 12s 578ms/step - loss: 0.3459 - acc: 0.8555
Epoch 290/500
20/20 [=====] - 13s 628ms/step - loss: 0.3413 - acc: 0.8535
Epoch 291/500
20/20 [=====] - 13s 628ms/step - loss: 0.3416 - acc: 0.8535
Epoch 292/500
20/20 [=====] - 12s 614ms/step - loss: 0.3352 - acc: 0.8727
Epoch 293/500
20/20 [=====] - 12s 614ms/step - loss: 0.3403 - acc: 0.8602
Epoch 294/500
20/20 [=====] - 13s 634ms/step - loss: 0.3346 - acc: 0.8641
Epoch 295/500
20/20 [=====] - 12s 586ms/step - loss: 0.3448 - acc: 0.8594
Epoch 296/500
20/20 [=====] - 13s 638ms/step - loss: 0.3649 - acc: 0.8438
Epoch 297/500
20/20 [=====] - 13s 633ms/step - loss: 0.3203 - acc: 0.8715
Epoch 298/500
20/20 [=====] - 12s 613ms/step - loss: 0.3087 - acc: 0.8777
Epoch 299/500
20/20 [=====] - 12s 619ms/step - loss: 0.3153 - acc: 0.8751
Epoch 300/500
20/20 [=====] - 12s 609ms/step - loss: 0.3664 - acc: 0.8461
Epoch 301/500
20/20 [=====] - 12s 578ms/step - loss: 0.3363 - acc: 0.8571
Epoch 302/500
20/20 [=====] - 13s 634ms/step - loss: 0.3470 - acc: 0.8532
Epoch 303/500
20/20 [=====] - 13s 633ms/step - loss: 0.3351 - acc: 0.8523
Epoch 304/500
20/20 [=====] - 12s 613ms/step - loss: 0.3456 - acc: 0.8544
Epoch 305/500
20/20 [=====] - 12s 619ms/step - loss: 0.3098 - acc: 0.8813
Epoch 306/500
20/20 [=====] - 12s 603ms/step - loss: 0.3198 - acc: 0.8751
Epoch 307/500
20/20 [=====] - 11s 573ms/step - loss: 0.3308 - acc: 0.8630
Epoch 308/500
20/20 [=====] - 13s 639ms/step - loss: 0.3358 - acc: 0.8641
Epoch 309/500
20/20 [=====] - 12s 622ms/step - loss: 0.3199 - acc: 0.8677
Epoch 310/500
20/20 [=====] - 12s 614ms/step - loss: 0.3120 - acc: 0.8641
Epoch 311/500
20/20 [=====] - 12s 608ms/step - loss: 0.3370 - acc: 0.8568
Epoch 312/500
20/20 [=====] - 12s 619ms/step - loss: 0.3309 - acc: 0.8621
Epoch 313/500
20/20 [=====] - 12s 593ms/step - loss: 0.3406 - acc: 0.8552
Epoch 314/500
20/20 [=====] - 13s 629ms/step - loss: 0.3190 - acc: 0.8625
Epoch 315/500
20/20 [=====] - 12s 623ms/step - loss: 0.3148 - acc: 0.8676
Epoch 316/500
20/20 [=====] - 12s 603ms/step - loss: 0.3201 - acc: 0.8754
Epoch 317/500
20/20 [=====] - 12s 610ms/step - loss: 0.3192 - acc: 0.8719
Epoch 318/500
20/20 [=====] - 12s 613ms/step - loss: 0.3441 - acc: 0.8634
Epoch 319/500

20/20 [=====] - 12s 581ms/step - loss: 0.3268 - acc: 0.8629
Epoch 320/500
20/20 [=====] - 13s 651ms/step - loss: 0.3400 - acc: 0.8595
Epoch 321/500
20/20 [=====] - 12s 624ms/step - loss: 0.3145 - acc: 0.8664
Epoch 322/500
20/20 [=====] - 12s 615ms/step - loss: 0.3839 - acc: 0.8470
Epoch 323/500
20/20 [=====] - 12s 624ms/step - loss: 0.3563 - acc: 0.8407
Epoch 324/500
20/20 [=====] - 12s 622ms/step - loss: 0.3376 - acc: 0.8727
Epoch 325/500
20/20 [=====] - 12s 578ms/step - loss: 0.3189 - acc: 0.8638
Epoch 326/500
20/20 [=====] - 13s 639ms/step - loss: 0.3186 - acc: 0.8711
Epoch 327/500
20/20 [=====] - 13s 638ms/step - loss: 0.3179 - acc: 0.8713
Epoch 328/500
20/20 [=====] - 12s 613ms/step - loss: 0.3348 - acc: 0.8677
Epoch 329/500
20/20 [=====] - 12s 609ms/step - loss: 0.2874 - acc: 0.8805
Epoch 330/500
20/20 [=====] - 12s 613ms/step - loss: 0.3306 - acc: 0.8626
Epoch 331/500
20/20 [=====] - 12s 583ms/step - loss: 0.3001 - acc: 0.8770
Epoch 332/500
20/20 [=====] - 13s 638ms/step - loss: 0.3597 - acc: 0.8380
Epoch 333/500
20/20 [=====] - 13s 638ms/step - loss: 0.3112 - acc: 0.8797
Epoch 334/500
20/20 [=====] - 12s 604ms/step - loss: 0.3331 - acc: 0.8704
Epoch 335/500
20/20 [=====] - 12s 609ms/step - loss: 0.3146 - acc: 0.8774
Epoch 336/500
20/20 [=====] - 12s 608ms/step - loss: 0.3270 - acc: 0.8670
Epoch 337/500
20/20 [=====] - 11s 574ms/step - loss: 0.3085 - acc: 0.8755
Epoch 338/500
20/20 [=====] - 13s 633ms/step - loss: 0.3392 - acc: 0.8629
Epoch 339/500
20/20 [=====] - 12s 623ms/step - loss: 0.3118 - acc: 0.8781
Epoch 340/500
20/20 [=====] - 12s 614ms/step - loss: 0.3300 - acc: 0.8625
Epoch 341/500
20/20 [=====] - 12s 617ms/step - loss: 0.3018 - acc: 0.8720
Epoch 342/500
20/20 [=====] - 12s 609ms/step - loss: 0.3212 - acc: 0.8731
Epoch 343/500
20/20 [=====] - 12s 583ms/step - loss: 0.3285 - acc: 0.8677
Epoch 344/500
20/20 [=====] - 13s 633ms/step - loss: 0.3237 - acc: 0.8641
Epoch 345/500
20/20 [=====] - 13s 644ms/step - loss: 0.2923 - acc: 0.8719
Epoch 346/500
20/20 [=====] - 12s 614ms/step - loss: 0.3353 - acc: 0.8648
Epoch 347/500
20/20 [=====] - 13s 625ms/step - loss: 0.3256 - acc: 0.8672
Epoch 348/500
20/20 [=====] - 12s 607ms/step - loss: 0.3125 - acc: 0.8805
Epoch 349/500
20/20 [=====] - 12s 578ms/step - loss: 0.3010 - acc: 0.8812
Epoch 350/500

Epoch 350/500
20/20 [=====] - 12s 624ms/step - loss: 0.3353 - acc: 0.8719
Epoch 351/500
20/20 [=====] - 13s 634ms/step - loss: 0.3418 - acc: 0.8635
Epoch 352/500
20/20 [=====] - 12s 622ms/step - loss: 0.3278 - acc: 0.8598
Epoch 353/500
20/20 [=====] - 12s 609ms/step - loss: 0.3205 - acc: 0.8664
Epoch 354/500
20/20 [=====] - 12s 609ms/step - loss: 0.2980 - acc: 0.8825
Epoch 355/500
20/20 [=====] - 11s 573ms/step - loss: 0.3236 - acc: 0.8637
Epoch 356/500
20/20 [=====] - 13s 638ms/step - loss: 0.3387 - acc: 0.8637
Epoch 357/500
20/20 [=====] - 13s 633ms/step - loss: 0.3180 - acc: 0.8707
Epoch 358/500
20/20 [=====] - 12s 608ms/step - loss: 0.3274 - acc: 0.8625
Epoch 359/500
20/20 [=====] - 12s 615ms/step - loss: 0.3074 - acc: 0.8763
Epoch 360/500
20/20 [=====] - 12s 603ms/step - loss: 0.3166 - acc: 0.8648
Epoch 361/500
20/20 [=====] - 12s 584ms/step - loss: 0.3046 - acc: 0.8695
Epoch 362/500
20/20 [=====] - 13s 639ms/step - loss: 0.3223 - acc: 0.8681
Epoch 363/500
20/20 [=====] - 12s 618ms/step - loss: 0.3175 - acc: 0.8624
Epoch 364/500
20/20 [=====] - 12s 608ms/step - loss: 0.3038 - acc: 0.8687
Epoch 365/500
20/20 [=====] - 12s 609ms/step - loss: 0.3204 - acc: 0.8676
Epoch 366/500
20/20 [=====] - 12s 624ms/step - loss: 0.3351 - acc: 0.8723
Epoch 367/500
20/20 [=====] - 11s 575ms/step - loss: 0.3044 - acc: 0.8825
Epoch 368/500
20/20 [=====] - 13s 627ms/step - loss: 0.2938 - acc: 0.8875
Epoch 369/500
20/20 [=====] - 13s 629ms/step - loss: 0.3313 - acc: 0.8560
Epoch 370/500
20/20 [=====] - 13s 642ms/step - loss: 0.3013 - acc: 0.8797
Epoch 371/500
20/20 [=====] - 12s 622ms/step - loss: 0.3146 - acc: 0.8697
Epoch 372/500
20/20 [=====] - 12s 618ms/step - loss: 0.2880 - acc: 0.8828
Epoch 373/500
20/20 [=====] - 12s 578ms/step - loss: 0.2689 - acc: 0.8965
Epoch 374/500
20/20 [=====] - 13s 633ms/step - loss: 0.3044 - acc: 0.8742
Epoch 375/500
20/20 [=====] - 13s 628ms/step - loss: 0.3119 - acc: 0.8754
Epoch 376/500
20/20 [=====] - 12s 613ms/step - loss: 0.3145 - acc: 0.8633
Epoch 377/500
20/20 [=====] - 12s 609ms/step - loss: 0.3204 - acc: 0.8695
Epoch 378/500
20/20 [=====] - 12s 603ms/step - loss: 0.3150 - acc: 0.8648
Epoch 379/500
20/20 [=====] - 12s 579ms/step - loss: 0.3063 - acc: 0.8770
Epoch 380/500
20/20 [=====] - 13s 637ms/step - loss: 0.3208 - acc: 0.8700

Epoch 381/500
20/20 [=====] - 12s 623ms/step - loss: 0.3070 - acc: 0.8695
Epoch 382/500
20/20 [=====] - 12s 618ms/step - loss: 0.3437 - acc: 0.8543
Epoch 383/500
20/20 [=====] - 12s 609ms/step - loss: 0.3120 - acc: 0.8797
Epoch 384/500
20/20 [=====] - 12s 613ms/step - loss: 0.3238 - acc: 0.8671
Epoch 385/500
20/20 [=====] - 12s 584ms/step - loss: 0.2990 - acc: 0.8739
Epoch 386/500
20/20 [=====] - 13s 633ms/step - loss: 0.3072 - acc: 0.8766
Epoch 387/500
20/20 [=====] - 13s 632ms/step - loss: 0.3388 - acc: 0.8642
Epoch 388/500
20/20 [=====] - 12s 609ms/step - loss: 0.3153 - acc: 0.8703
Epoch 389/500
20/20 [=====] - 12s 610ms/step - loss: 0.2980 - acc: 0.8772
Epoch 390/500
20/20 [=====] - 12s 613ms/step - loss: 0.3075 - acc: 0.8781
Epoch 391/500
20/20 [=====] - 11s 574ms/step - loss: 0.3308 - acc: 0.8688
Epoch 392/500
20/20 [=====] - 13s 643ms/step - loss: 0.3055 - acc: 0.8742
Epoch 393/500
20/20 [=====] - 13s 628ms/step - loss: 0.3031 - acc: 0.8704
Epoch 394/500
20/20 [=====] - 12s 608ms/step - loss: 0.3087 - acc: 0.8688
Epoch 395/500
20/20 [=====] - 13s 630ms/step - loss: 0.2907 - acc: 0.8888
Epoch 396/500
20/20 [=====] - 13s 631ms/step - loss: 0.3366 - acc: 0.8614
Epoch 397/500
20/20 [=====] - 12s 579ms/step - loss: 0.2877 - acc: 0.8808
Epoch 398/500
20/20 [=====] - 13s 638ms/step - loss: 0.2950 - acc: 0.8828
Epoch 399/500
20/20 [=====] - 12s 623ms/step - loss: 0.3139 - acc: 0.8777
Epoch 400/500
20/20 [=====] - 12s 619ms/step - loss: 0.3092 - acc: 0.8708
Epoch 401/500
20/20 [=====] - 12s 614ms/step - loss: 0.2833 - acc: 0.8785
Epoch 402/500
20/20 [=====] - 12s 608ms/step - loss: 0.3305 - acc: 0.8681
Epoch 403/500
20/20 [=====] - 12s 577ms/step - loss: 0.3017 - acc: 0.8789
Epoch 404/500
20/20 [=====] - 13s 628ms/step - loss: 0.3082 - acc: 0.8706
Epoch 405/500
20/20 [=====] - 13s 638ms/step - loss: 0.2833 - acc: 0.8907
Epoch 406/500
20/20 [=====] - 12s 613ms/step - loss: 0.2868 - acc: 0.8891
Epoch 407/500
20/20 [=====] - 12s 610ms/step - loss: 0.3360 - acc: 0.8707
Epoch 408/500
20/20 [=====] - 12s 604ms/step - loss: 0.2756 - acc: 0.9016
Epoch 409/500
20/20 [=====] - 12s 579ms/step - loss: 0.3171 - acc: 0.8724
Epoch 410/500
20/20 [=====] - 13s 643ms/step - loss: 0.3008 - acc: 0.8696
Epoch 411/500
20/20 [=====] - 13s 628ms/step - loss: 0.3002 - acc: 0.8724

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20/20 [=====] - 10s 620ms/step - loss: 0.3092 - acc: 0.8734
Epoch 412/500
20/20 [=====] - 12s 609ms/step - loss: 0.3088 - acc: 0.8747
Epoch 413/500
20/20 [=====] - 12s 613ms/step - loss: 0.3040 - acc: 0.8742
Epoch 414/500
20/20 [=====] - 12s 617ms/step - loss: 0.3223 - acc: 0.8711
Epoch 415/500
20/20 [=====] - 12s 584ms/step - loss: 0.3028 - acc: 0.8751
Epoch 416/500
20/20 [=====] - 13s 639ms/step - loss: 0.2882 - acc: 0.8906
Epoch 417/500
20/20 [=====] - 12s 624ms/step - loss: 0.3103 - acc: 0.8770
Epoch 418/500
20/20 [=====] - 12s 613ms/step - loss: 0.3151 - acc: 0.8728
Epoch 419/500
20/20 [=====] - 12s 612ms/step - loss: 0.3048 - acc: 0.8700
Epoch 420/500
20/20 [=====] - 12s 615ms/step - loss: 0.3272 - acc: 0.8610
Epoch 421/500
20/20 [=====] - 12s 602ms/step - loss: 0.3096 - acc: 0.8848
Epoch 422/500
20/20 [=====] - 13s 628ms/step - loss: 0.3044 - acc: 0.8750
Epoch 423/500
20/20 [=====] - 13s 628ms/step - loss: 0.2910 - acc: 0.8829
Epoch 424/500
20/20 [=====] - 12s 614ms/step - loss: 0.2894 - acc: 0.8859
Epoch 425/500
20/20 [=====] - 12s 614ms/step - loss: 0.3003 - acc: 0.8875
Epoch 426/500
20/20 [=====] - 12s 609ms/step - loss: 0.2889 - acc: 0.8848
Epoch 427/500
20/20 [=====] - 11s 574ms/step - loss: 0.2705 - acc: 0.8884
Epoch 428/500
20/20 [=====] - 12s 623ms/step - loss: 0.3239 - acc: 0.8789
Epoch 429/500
20/20 [=====] - 12s 623ms/step - loss: 0.3185 - acc: 0.8713
Epoch 430/500
20/20 [=====] - 12s 619ms/step - loss: 0.2965 - acc: 0.8813
Epoch 431/500
20/20 [=====] - 12s 613ms/step - loss: 0.3122 - acc: 0.8778
Epoch 432/500
20/20 [=====] - 12s 603ms/step - loss: 0.3268 - acc: 0.8661
Epoch 433/500
20/20 [=====] - 12s 578ms/step - loss: 0.3166 - acc: 0.8711
Epoch 434/500
20/20 [=====] - 13s 633ms/step - loss: 0.2961 - acc: 0.8871
Epoch 435/500
20/20 [=====] - 13s 633ms/step - loss: 0.2958 - acc: 0.8872
Epoch 436/500
20/20 [=====] - 12s 608ms/step - loss: 0.3025 - acc: 0.8727
Epoch 437/500
20/20 [=====] - 12s 609ms/step - loss: 0.2927 - acc: 0.8809
Epoch 438/500
20/20 [=====] - 12s 608ms/step - loss: 0.2757 - acc: 0.8896
Epoch 439/500
20/20 [=====] - 12s 583ms/step - loss: 0.3113 - acc: 0.8731
Epoch 440/500
20/20 [=====] - 13s 643ms/step - loss: 0.2884 - acc: 0.8805
Epoch 441/500
20/20 [=====] - 12s 623ms/step - loss: 0.2936 - acc: 0.8911
Epoch 442/500
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20/20 [=====] - 12s 604ms/step - loss: 0.3152 - acc: 0.8742
Epoch 443/500
20/20 [=====] - 12s 603ms/step - loss: 0.2958 - acc: 0.8852
Epoch 444/500
20/20 [=====] - 12s 619ms/step - loss: 0.3068 - acc: 0.8700
Epoch 445/500
20/20 [=====] - 12s 584ms/step - loss: 0.2663 - acc: 0.8860
Epoch 446/500
20/20 [=====] - 13s 649ms/step - loss: 0.3414 - acc: 0.8591
Epoch 447/500
20/20 [=====] - 13s 632ms/step - loss: 0.2792 - acc: 0.8953
Epoch 448/500
20/20 [=====] - 12s 620ms/step - loss: 0.3039 - acc: 0.8750
Epoch 449/500
20/20 [=====] - 12s 618ms/step - loss: 0.2895 - acc: 0.8863
Epoch 450/500
20/20 [=====] - 12s 609ms/step - loss: 0.3189 - acc: 0.8634
Epoch 451/500
20/20 [=====] - 12s 577ms/step - loss: 0.3103 - acc: 0.8693
Epoch 452/500
20/20 [=====] - 13s 628ms/step - loss: 0.2796 - acc: 0.8923
Epoch 453/500
20/20 [=====] - 12s 623ms/step - loss: 0.3177 - acc: 0.8629
Epoch 454/500
20/20 [=====] - 12s 619ms/step - loss: 0.2994 - acc: 0.8820
Epoch 455/500
20/20 [=====] - 12s 604ms/step - loss: 0.3089 - acc: 0.8735
Epoch 456/500
20/20 [=====] - 12s 604ms/step - loss: 0.3166 - acc: 0.8633
Epoch 457/500
20/20 [=====] - 11s 573ms/step - loss: 0.2968 - acc: 0.8817
Epoch 458/500
20/20 [=====] - 13s 630ms/step - loss: 0.2856 - acc: 0.8786
Epoch 459/500
20/20 [=====] - 13s 625ms/step - loss: 0.2986 - acc: 0.8836
Epoch 460/500
20/20 [=====] - 12s 604ms/step - loss: 0.2609 - acc: 0.8906
Epoch 461/500
20/20 [=====] - 12s 603ms/step - loss: 0.2850 - acc: 0.8852
Epoch 462/500
20/20 [=====] - 12s 603ms/step - loss: 0.2953 - acc: 0.8766
Epoch 463/500
20/20 [=====] - 12s 577ms/step - loss: 0.2897 - acc: 0.8882
Epoch 464/500
20/20 [=====] - 13s 644ms/step - loss: 0.2867 - acc: 0.8844
Epoch 465/500
20/20 [=====] - 12s 623ms/step - loss: 0.3085 - acc: 0.8777
Epoch 466/500
20/20 [=====] - 12s 610ms/step - loss: 0.2855 - acc: 0.8844
Epoch 467/500
20/20 [=====] - 12s 608ms/step - loss: 0.2710 - acc: 0.8914
Epoch 468/500
20/20 [=====] - 12s 608ms/step - loss: 0.3010 - acc: 0.8870
Epoch 469/500
20/20 [=====] - 12s 578ms/step - loss: 0.2724 - acc: 0.8953
Epoch 470/500
20/20 [=====] - 13s 629ms/step - loss: 0.2869 - acc: 0.8821
Epoch 471/500
20/20 [=====] - 13s 629ms/step - loss: 0.3030 - acc: 0.8859
Epoch 472/500
20/20 [=====] - 12s 617ms/step - loss: 0.2850 - acc: 0.8938
Epoch 473/500

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Epoch 473/500
20/20 [=====] - 13s 628ms/step - loss: 0.2721 - acc: 0.8927
Epoch 474/500
20/20 [=====] - 12s 608ms/step - loss: 0.2932 - acc: 0.8887
Epoch 475/500
20/20 [=====] - 11s 574ms/step - loss: 0.2616 - acc: 0.8980
Epoch 476/500
20/20 [=====] - 13s 629ms/step - loss: 0.3178 - acc: 0.8797
Epoch 477/500
20/20 [=====] - 13s 628ms/step - loss: 0.2910 - acc: 0.8832
Epoch 478/500
20/20 [=====] - 12s 614ms/step - loss: 0.2917 - acc: 0.8841
Epoch 479/500
20/20 [=====] - 12s 614ms/step - loss: 0.3170 - acc: 0.8586
Epoch 480/500
20/20 [=====] - 12s 608ms/step - loss: 0.2681 - acc: 0.8977
Epoch 481/500
20/20 [=====] - 11s 569ms/step - loss: 0.2786 - acc: 0.8946
Epoch 482/500
20/20 [=====] - 13s 629ms/step - loss: 0.2737 - acc: 0.8891
Epoch 483/500
20/20 [=====] - 13s 628ms/step - loss: 0.3001 - acc: 0.8781
Epoch 484/500
20/20 [=====] - 12s 618ms/step - loss: 0.2760 - acc: 0.8938
Epoch 485/500
20/20 [=====] - 12s 608ms/step - loss: 0.2807 - acc: 0.8813
Epoch 486/500
20/20 [=====] - 12s 604ms/step - loss: 0.2864 - acc: 0.8926
Epoch 487/500
20/20 [=====] - 11s 573ms/step - loss: 0.2791 - acc: 0.8754
Epoch 488/500
20/20 [=====] - 12s 623ms/step - loss: 0.2960 - acc: 0.8723
Epoch 489/500
20/20 [=====] - 13s 628ms/step - loss: 0.2710 - acc: 0.8977
Epoch 490/500
20/20 [=====] - 12s 608ms/step - loss: 0.2734 - acc: 0.9032
Epoch 491/500
20/20 [=====] - 12s 603ms/step - loss: 0.2643 - acc: 0.8965
Epoch 492/500
20/20 [=====] - 12s 603ms/step - loss: 0.2935 - acc: 0.8875
Epoch 493/500
20/20 [=====] - 12s 578ms/step - loss: 0.3013 - acc: 0.8859
Epoch 494/500
20/20 [=====] - 13s 628ms/step - loss: 0.2886 - acc: 0.8830
Epoch 495/500
20/20 [=====] - 12s 623ms/step - loss: 0.2938 - acc: 0.8851
Epoch 496/500
20/20 [=====] - 12s 604ms/step - loss: 0.3260 - acc: 0.8695
Epoch 497/500
20/20 [=====] - 13s 629ms/step - loss: 0.2919 - acc: 0.8766
Epoch 498/500
20/20 [=====] - 12s 618ms/step - loss: 0.2565 - acc: 0.8965
Epoch 499/500
20/20 [=====] - 12s 578ms/step - loss: 0.2780 - acc: 0.8923
Epoch 500/500
20/20 [=====] - 12s 624ms/step - loss: 0.2919 - acc: 0.8910
Accuracyloss:- 0.628878213763237
AccuracyScore 0.764000002861023
dict_keys(['val_loss', 'val_acc', 'loss', 'acc'])

```





