

Face_comparison

June 21, 2022

```
[39]: from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

```
[40]: #importing important libraries
from keras import datasets, Sequential
from keras.layers import Conv2D, Dense, MaxPooling2D, Flatten, Dropout
import matplotlib.pyplot as plt
from sklearn.metrics import confusion_matrix
from sklearn.model_selection import train_test_split
from keras.callbacks import ModelCheckpoint
import numpy as np
from keras.utils import np_utils
from keras.datasets import cifar10
import matplotlib.pyplot as plt
from tensorflow.keras.optimizers import Adam
from keras.preprocessing import image
from keras.models import load_model
from keras.preprocessing.image import load_img,
    ↳img_to_array, array_to_img, ImageDataGenerator
import numpy as np
import os
import cv2 as cv
```

```
[51]: dir_folder = '/content/drive/MyDrive/Face_comparison/train'
x_train = []
y_train = []
labels = []
count = 0

# tạo dữ liệu training
for i in os.listdir(dir_folder):

    path = os.path.join(dir_folder, i)
    labels.append(str(i))

    for j in os.listdir(path):
```

```

path_img = os.path.join(path,j)

img = load_img(path_img, target_size=(128,128))
img = img_to_array(img)
img = img.reshape(128,128,3)
img = img.astype('float32')
img = img/255

x_train.append(img)
y_train.append(count)

count += 1

```

```

[52]: x_train = np.asarray(x_train)
      y_train = np.asarray(y_train)
      y_train = np_utils.to_categorical(y_train)

      print(x_train.shape, y_train.shape)

```

(363, 128, 128, 3) (363, 12)

```

[53]: x_train, x_test, y_train, y_test = train_test_split(x_train, y_train,
      ↪test_size=0.2, random_state=70)
      print(x_train.shape, y_train.shape)
      print(x_test.shape, y_test.shape)

```

(290, 128, 128, 3) (290, 12)

(73, 128, 128, 3) (73, 12)

```

[54]: model = Sequential()

model.add(Conv2D(filters=32,
                  kernel_size=(2,2),
                  activation='relu',
                  kernel_initializer='he_uniform',
                  padding='same',
                  input_shape=(128,128,3),
                  strides=(1,1)))

model.add(Conv2D(filters=64,
                  kernel_size=(2,2),
                  activation='relu',
                  padding='same',
                  strides=(1,1)))

model.add(Conv2D(filters=128,

```

```

        kernel_size=(2,2),
        padding='same',
        activation='relu',
        strides=(2,2)))

model.add(Conv2D(filters=256,
                 kernel_size=(2,2),
                 padding='same',
                 activation='relu',
                 strides=(1,1)))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())

model.add(Dense(512, activation='relu',input_shape=(128*128*3,), name='layer1'))
model.add(Dropout(0.2))
model.add(Dense(1028, activation='relu', name='layer2'))
model.add(Dropout(0.2))
model.add(Dense(2056, activation='relu', name='layer3'))
model.add(Dropout(0.2))
model.add(Dense(2056, activation='relu', name='layer5'))
model.add(Dropout(0.2))
model.add(Dense(1028, activation='relu', name='layer6'))
model.add(Dropout(0.2))
model.add(Dense(12, activation='softmax', name='layer7'))

model.summary()

model.compile(loss = 'categorical_crossentropy', optimizer = Adam(lr=0.
↪000001),metrics = ['accuracy'])
history = model.fit(x_train, y_train, epochs=2000, verbose=1)
model.save('/content/drive/MyDrive/Face_comparison/Face_comparison.h5')

```

Model: "sequential_1"

| Layer (type) | Output Shape | Param # |
|---------------------------------|----------------------|---------|
| ===== | | |
| conv2d_4 (Conv2D) | (None, 128, 128, 32) | 416 |
| conv2d_5 (Conv2D) | (None, 128, 128, 64) | 8256 |
| conv2d_6 (Conv2D) | (None, 64, 64, 128) | 32896 |
| conv2d_7 (Conv2D) | (None, 64, 64, 256) | 131328 |
| max_pooling2d_1 (MaxPooling 2D) | (None, 32, 32, 256) | 0 |

| | | |
|---------------------|----------------|-----------|
| flatten_1 (Flatten) | (None, 262144) | 0 |
| layer1 (Dense) | (None, 512) | 134218240 |
| dropout_5 (Dropout) | (None, 512) | 0 |
| layer2 (Dense) | (None, 1028) | 527364 |
| dropout_6 (Dropout) | (None, 1028) | 0 |
| layer3 (Dense) | (None, 2056) | 2115624 |
| dropout_7 (Dropout) | (None, 2056) | 0 |
| layer5 (Dense) | (None, 2056) | 4229192 |
| dropout_8 (Dropout) | (None, 2056) | 0 |
| layer6 (Dense) | (None, 1028) | 2114596 |
| dropout_9 (Dropout) | (None, 1028) | 0 |
| layer7 (Dense) | (None, 12) | 12348 |

=====

Total params: 143,390,260

Trainable params: 143,390,260

Non-trainable params: 0

Epoch 1/2000

/usr/local/lib/python3.7/dist-packages/keras/optimizer_v2/adam.py:105:

UserWarning: The `lr` argument is deprecated, use `learning_rate` instead.

super(Adam, self).__init__(name, **kwargs)

10/10 [=====] - 2s 136ms/step - loss: 2.4856 -

accuracy: 0.0897

Epoch 2/2000

10/10 [=====] - 1s 103ms/step - loss: 2.4793 -

accuracy: 0.1034

Epoch 3/2000

10/10 [=====] - 1s 104ms/step - loss: 2.4843 -

accuracy: 0.0828

Epoch 4/2000

10/10 [=====] - 1s 109ms/step - loss: 2.4882 -

accuracy: 0.0586

Epoch 5/2000

10/10 [=====] - 1s 103ms/step - loss: 2.4787 -

accuracy: 0.0931

Epoch 6/2000
10/10 [=====] - 1s 103ms/step - loss: 2.4786 -
accuracy: 0.1172

Epoch 7/2000
10/10 [=====] - 1s 102ms/step - loss: 2.4800 -
accuracy: 0.1138

Epoch 8/2000
10/10 [=====] - 1s 103ms/step - loss: 2.4759 -
accuracy: 0.1069

Epoch 9/2000
10/10 [=====] - 1s 103ms/step - loss: 2.4783 -
accuracy: 0.1069

Epoch 10/2000
10/10 [=====] - 1s 103ms/step - loss: 2.4713 -
accuracy: 0.1276

Epoch 11/2000
10/10 [=====] - 1s 103ms/step - loss: 2.4709 -
accuracy: 0.1241

Epoch 12/2000
10/10 [=====] - 1s 103ms/step - loss: 2.4617 -
accuracy: 0.1345

Epoch 13/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4753 -
accuracy: 0.1103

Epoch 14/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4673 -
accuracy: 0.0931

Epoch 15/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4755 -
accuracy: 0.0931

Epoch 16/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4675 -
accuracy: 0.1379

Epoch 17/2000
10/10 [=====] - 1s 103ms/step - loss: 2.4633 -
accuracy: 0.1207

Epoch 18/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4659 -
accuracy: 0.0966

Epoch 19/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4650 -
accuracy: 0.1448

Epoch 20/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4674 -
accuracy: 0.1103

Epoch 21/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4624 -
accuracy: 0.1000

Epoch 22/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4715 -
accuracy: 0.1000

Epoch 23/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4599 -
accuracy: 0.1310

Epoch 24/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4603 -
accuracy: 0.1448

Epoch 25/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4643 -
accuracy: 0.1069

Epoch 26/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4580 -
accuracy: 0.1276

Epoch 27/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4664 -
accuracy: 0.1379

Epoch 28/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4577 -
accuracy: 0.1379

Epoch 29/2000
10/10 [=====] - 1s 104ms/step - loss: 2.4665 -
accuracy: 0.0966

Epoch 30/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4600 -
accuracy: 0.1138

Epoch 31/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4506 -
accuracy: 0.1276

Epoch 32/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4559 -
accuracy: 0.1276

Epoch 33/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4562 -
accuracy: 0.1241

Epoch 34/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4611 -
accuracy: 0.1138

Epoch 35/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4566 -
accuracy: 0.1310

Epoch 36/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4488 -
accuracy: 0.1207

Epoch 37/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4478 -
accuracy: 0.1414

Epoch 38/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4525 -
accuracy: 0.1069
Epoch 39/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4676 -
accuracy: 0.0966
Epoch 40/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4471 -
accuracy: 0.1138
Epoch 41/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4569 -
accuracy: 0.1069
Epoch 42/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4571 -
accuracy: 0.1414
Epoch 43/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4447 -
accuracy: 0.1207
Epoch 44/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4450 -
accuracy: 0.1310
Epoch 45/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4388 -
accuracy: 0.1448
Epoch 46/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4462 -
accuracy: 0.1517
Epoch 47/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4388 -
accuracy: 0.1414
Epoch 48/2000
10/10 [=====] - 1s 109ms/step - loss: 2.4557 -
accuracy: 0.1207
Epoch 49/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4501 -
accuracy: 0.1069
Epoch 50/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4524 -
accuracy: 0.1138
Epoch 51/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4496 -
accuracy: 0.1414
Epoch 52/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4488 -
accuracy: 0.1379
Epoch 53/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4531 -
accuracy: 0.1276

Epoch 54/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4393 -
accuracy: 0.1241
Epoch 55/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4478 -
accuracy: 0.1103
Epoch 56/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4566 -
accuracy: 0.1069
Epoch 57/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4289 -
accuracy: 0.1552
Epoch 58/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4418 -
accuracy: 0.1172
Epoch 59/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4388 -
accuracy: 0.1276
Epoch 60/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4341 -
accuracy: 0.1414
Epoch 61/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4461 -
accuracy: 0.1276
Epoch 62/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4507 -
accuracy: 0.1379
Epoch 63/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4497 -
accuracy: 0.1069
Epoch 64/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4345 -
accuracy: 0.1241
Epoch 65/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4317 -
accuracy: 0.1207
Epoch 66/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4486 -
accuracy: 0.1034
Epoch 67/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4436 -
accuracy: 0.1172
Epoch 68/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4322 -
accuracy: 0.1448
Epoch 69/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4617 -
accuracy: 0.1069

Epoch 70/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4414 -
accuracy: 0.1345

Epoch 71/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4372 -
accuracy: 0.1414

Epoch 72/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4354 -
accuracy: 0.1276

Epoch 73/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4322 -
accuracy: 0.1586

Epoch 74/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4366 -
accuracy: 0.1483

Epoch 75/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4415 -
accuracy: 0.1241

Epoch 76/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4394 -
accuracy: 0.1345

Epoch 77/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4255 -
accuracy: 0.1448

Epoch 78/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4364 -
accuracy: 0.1379

Epoch 79/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4297 -
accuracy: 0.1310

Epoch 80/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4290 -
accuracy: 0.1483

Epoch 81/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4111 -
accuracy: 0.1552

Epoch 82/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4226 -
accuracy: 0.1655

Epoch 83/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4295 -
accuracy: 0.1414

Epoch 84/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4207 -
accuracy: 0.1517

Epoch 85/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4243 -
accuracy: 0.1759

Epoch 86/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4127 -
accuracy: 0.1690
Epoch 87/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4379 -
accuracy: 0.1552
Epoch 88/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4093 -
accuracy: 0.1828
Epoch 89/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4319 -
accuracy: 0.1379
Epoch 90/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4393 -
accuracy: 0.1586
Epoch 91/2000
10/10 [=====] - 1s 105ms/step - loss: 2.4090 -
accuracy: 0.1862
Epoch 92/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4189 -
accuracy: 0.1483
Epoch 93/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4260 -
accuracy: 0.1379
Epoch 94/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4184 -
accuracy: 0.1241
Epoch 95/2000
10/10 [=====] - 1s 109ms/step - loss: 2.3985 -
accuracy: 0.1621
Epoch 96/2000
10/10 [=====] - 1s 109ms/step - loss: 2.4173 -
accuracy: 0.1621
Epoch 97/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4228 -
accuracy: 0.1552
Epoch 98/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4173 -
accuracy: 0.1483
Epoch 99/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4143 -
accuracy: 0.1345
Epoch 100/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4182 -
accuracy: 0.1483
Epoch 101/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4167 -
accuracy: 0.1862

Epoch 102/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4077 -
accuracy: 0.1414
Epoch 103/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4092 -
accuracy: 0.1724
Epoch 104/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4165 -
accuracy: 0.1621
Epoch 105/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4176 -
accuracy: 0.1483
Epoch 106/2000
10/10 [=====] - 1s 106ms/step - loss: 2.3938 -
accuracy: 0.1759
Epoch 107/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3965 -
accuracy: 0.1552
Epoch 108/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3981 -
accuracy: 0.1690
Epoch 109/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4110 -
accuracy: 0.1690
Epoch 110/2000
10/10 [=====] - 1s 106ms/step - loss: 2.3982 -
accuracy: 0.1759
Epoch 111/2000
10/10 [=====] - 1s 106ms/step - loss: 2.4019 -
accuracy: 0.1586
Epoch 112/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4033 -
accuracy: 0.1552
Epoch 113/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4003 -
accuracy: 0.1690
Epoch 114/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3889 -
accuracy: 0.1862
Epoch 115/2000
10/10 [=====] - 1s 106ms/step - loss: 2.3949 -
accuracy: 0.1793
Epoch 116/2000
10/10 [=====] - 1s 106ms/step - loss: 2.3899 -
accuracy: 0.1828
Epoch 117/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3921 -
accuracy: 0.1552

Epoch 118/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3970 -
accuracy: 0.1552

Epoch 119/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4019 -
accuracy: 0.1621

Epoch 120/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4091 -
accuracy: 0.1655

Epoch 121/2000
10/10 [=====] - 1s 105ms/step - loss: 2.3950 -
accuracy: 0.1793

Epoch 122/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3926 -
accuracy: 0.1862

Epoch 123/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3976 -
accuracy: 0.1414

Epoch 124/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3975 -
accuracy: 0.1552

Epoch 125/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3965 -
accuracy: 0.2069

Epoch 126/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3878 -
accuracy: 0.1655

Epoch 127/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3791 -
accuracy: 0.1793

Epoch 128/2000
10/10 [=====] - 1s 107ms/step - loss: 2.4012 -
accuracy: 0.1483

Epoch 129/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3990 -
accuracy: 0.1621

Epoch 130/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3862 -
accuracy: 0.1655

Epoch 131/2000
10/10 [=====] - 1s 106ms/step - loss: 2.3806 -
accuracy: 0.1759

Epoch 132/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3924 -
accuracy: 0.1724

Epoch 133/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3834 -
accuracy: 0.2000

Epoch 134/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3615 -
accuracy: 0.1931
Epoch 135/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3786 -
accuracy: 0.2034
Epoch 136/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3966 -
accuracy: 0.1931
Epoch 137/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3724 -
accuracy: 0.1931
Epoch 138/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3695 -
accuracy: 0.2034
Epoch 139/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3704 -
accuracy: 0.1862
Epoch 140/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3708 -
accuracy: 0.2276
Epoch 141/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3676 -
accuracy: 0.2069
Epoch 142/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3597 -
accuracy: 0.2310
Epoch 143/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3674 -
accuracy: 0.1931
Epoch 144/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3478 -
accuracy: 0.2207
Epoch 145/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3459 -
accuracy: 0.2138
Epoch 146/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3768 -
accuracy: 0.1793
Epoch 147/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3681 -
accuracy: 0.1793
Epoch 148/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3355 -
accuracy: 0.2310
Epoch 149/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3565 -
accuracy: 0.1931

Epoch 150/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3633 -
accuracy: 0.2034
Epoch 151/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3359 -
accuracy: 0.2379
Epoch 152/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3416 -
accuracy: 0.2172
Epoch 153/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3587 -
accuracy: 0.1931
Epoch 154/2000
10/10 [=====] - 1s 109ms/step - loss: 2.3463 -
accuracy: 0.2034
Epoch 155/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3249 -
accuracy: 0.2448
Epoch 156/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3541 -
accuracy: 0.2034
Epoch 157/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3509 -
accuracy: 0.2103
Epoch 158/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3346 -
accuracy: 0.2207
Epoch 159/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3307 -
accuracy: 0.2448
Epoch 160/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3272 -
accuracy: 0.2207
Epoch 161/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3380 -
accuracy: 0.1828
Epoch 162/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3187 -
accuracy: 0.2379
Epoch 163/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3141 -
accuracy: 0.2379
Epoch 164/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3316 -
accuracy: 0.2172
Epoch 165/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3398 -
accuracy: 0.2034

Epoch 166/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3301 -
accuracy: 0.2310
Epoch 167/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3398 -
accuracy: 0.2483
Epoch 168/2000
10/10 [=====] - 1s 106ms/step - loss: 2.3128 -
accuracy: 0.2138
Epoch 169/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3116 -
accuracy: 0.2379
Epoch 170/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3242 -
accuracy: 0.2345
Epoch 171/2000
10/10 [=====] - 1s 106ms/step - loss: 2.3268 -
accuracy: 0.2241
Epoch 172/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3161 -
accuracy: 0.2586
Epoch 173/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3139 -
accuracy: 0.2379
Epoch 174/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2995 -
accuracy: 0.2448
Epoch 175/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3051 -
accuracy: 0.2931
Epoch 176/2000
10/10 [=====] - 1s 106ms/step - loss: 2.3096 -
accuracy: 0.2621
Epoch 177/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3191 -
accuracy: 0.2448
Epoch 178/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3128 -
accuracy: 0.2448
Epoch 179/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2982 -
accuracy: 0.2379
Epoch 180/2000
10/10 [=====] - 1s 108ms/step - loss: 2.3098 -
accuracy: 0.2483
Epoch 181/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2883 -
accuracy: 0.2897

Epoch 182/2000
10/10 [=====] - 1s 107ms/step - loss: 2.3029 -
accuracy: 0.2345
Epoch 183/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2853 -
accuracy: 0.2966
Epoch 184/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2721 -
accuracy: 0.2759
Epoch 185/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2654 -
accuracy: 0.2690
Epoch 186/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2941 -
accuracy: 0.2655
Epoch 187/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2745 -
accuracy: 0.2414
Epoch 188/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2973 -
accuracy: 0.2414
Epoch 189/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2790 -
accuracy: 0.2828
Epoch 190/2000
10/10 [=====] - 1s 106ms/step - loss: 2.2791 -
accuracy: 0.2345
Epoch 191/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2653 -
accuracy: 0.2759
Epoch 192/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2724 -
accuracy: 0.2552
Epoch 193/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2650 -
accuracy: 0.2310
Epoch 194/2000
10/10 [=====] - 1s 109ms/step - loss: 2.2526 -
accuracy: 0.2897
Epoch 195/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2870 -
accuracy: 0.2483
Epoch 196/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2687 -
accuracy: 0.2483
Epoch 197/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2413 -
accuracy: 0.2828

Epoch 198/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2384 -
accuracy: 0.2483
Epoch 199/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2529 -
accuracy: 0.3034
Epoch 200/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2416 -
accuracy: 0.2690
Epoch 201/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2374 -
accuracy: 0.3069
Epoch 202/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2443 -
accuracy: 0.3000
Epoch 203/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2502 -
accuracy: 0.3000
Epoch 204/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2405 -
accuracy: 0.3069
Epoch 205/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2379 -
accuracy: 0.3276
Epoch 206/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2342 -
accuracy: 0.3069
Epoch 207/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2125 -
accuracy: 0.3483
Epoch 208/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2343 -
accuracy: 0.3000
Epoch 209/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2458 -
accuracy: 0.2655
Epoch 210/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2080 -
accuracy: 0.3241
Epoch 211/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2318 -
accuracy: 0.3103
Epoch 212/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2083 -
accuracy: 0.2828
Epoch 213/2000
10/10 [=====] - 1s 108ms/step - loss: 2.2234 -
accuracy: 0.3000

Epoch 214/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2079 -
accuracy: 0.3207
Epoch 215/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2114 -
accuracy: 0.3241
Epoch 216/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2075 -
accuracy: 0.2828
Epoch 217/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2007 -
accuracy: 0.3241
Epoch 218/2000
10/10 [=====] - 1s 107ms/step - loss: 2.2115 -
accuracy: 0.2828
Epoch 219/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1834 -
accuracy: 0.3379
Epoch 220/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1999 -
accuracy: 0.3138
Epoch 221/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1805 -
accuracy: 0.3379
Epoch 222/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1934 -
accuracy: 0.3103
Epoch 223/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1665 -
accuracy: 0.3621
Epoch 224/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1817 -
accuracy: 0.3310
Epoch 225/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1877 -
accuracy: 0.3069
Epoch 226/2000
10/10 [=====] - 1s 106ms/step - loss: 2.1581 -
accuracy: 0.3621
Epoch 227/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1762 -
accuracy: 0.3379
Epoch 228/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1872 -
accuracy: 0.3103
Epoch 229/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1718 -
accuracy: 0.3172

Epoch 230/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1642 -
accuracy: 0.3655
Epoch 231/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1603 -
accuracy: 0.3276
Epoch 232/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1697 -
accuracy: 0.3345
Epoch 233/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1626 -
accuracy: 0.3379
Epoch 234/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1565 -
accuracy: 0.3207
Epoch 235/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1630 -
accuracy: 0.3172
Epoch 236/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1611 -
accuracy: 0.3552
Epoch 237/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1517 -
accuracy: 0.3379
Epoch 238/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1412 -
accuracy: 0.3517
Epoch 239/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1571 -
accuracy: 0.3517
Epoch 240/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1312 -
accuracy: 0.3448
Epoch 241/2000
10/10 [=====] - 1s 107ms/step - loss: 2.1203 -
accuracy: 0.3172
Epoch 242/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1077 -
accuracy: 0.3414
Epoch 243/2000
10/10 [=====] - 1s 109ms/step - loss: 2.1205 -
accuracy: 0.3379
Epoch 244/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1249 -
accuracy: 0.3172
Epoch 245/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0797 -
accuracy: 0.3931

Epoch 246/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1009 -
accuracy: 0.3862
Epoch 247/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1152 -
accuracy: 0.3552
Epoch 248/2000
10/10 [=====] - 1s 108ms/step - loss: 2.1185 -
accuracy: 0.3448
Epoch 249/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0640 -
accuracy: 0.3862
Epoch 250/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0893 -
accuracy: 0.3724
Epoch 251/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0797 -
accuracy: 0.3897
Epoch 252/2000
10/10 [=====] - 1s 107ms/step - loss: 2.0953 -
accuracy: 0.3483
Epoch 253/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0715 -
accuracy: 0.4000
Epoch 254/2000
10/10 [=====] - 1s 109ms/step - loss: 2.0583 -
accuracy: 0.3724
Epoch 255/2000
10/10 [=====] - 1s 107ms/step - loss: 2.0529 -
accuracy: 0.3828
Epoch 256/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0742 -
accuracy: 0.3690
Epoch 257/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0918 -
accuracy: 0.3552
Epoch 258/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0804 -
accuracy: 0.3655
Epoch 259/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0541 -
accuracy: 0.3724
Epoch 260/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0459 -
accuracy: 0.3931
Epoch 261/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0677 -
accuracy: 0.3690

Epoch 262/2000
10/10 [=====] - 1s 107ms/step - loss: 2.0494 -
accuracy: 0.3655
Epoch 263/2000
10/10 [=====] - 1s 107ms/step - loss: 2.0678 -
accuracy: 0.3621
Epoch 264/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0490 -
accuracy: 0.3931
Epoch 265/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0203 -
accuracy: 0.4069
Epoch 266/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0178 -
accuracy: 0.4103
Epoch 267/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0396 -
accuracy: 0.3655
Epoch 268/2000
10/10 [=====] - 1s 107ms/step - loss: 2.0159 -
accuracy: 0.4345
Epoch 269/2000
10/10 [=====] - 1s 107ms/step - loss: 2.0314 -
accuracy: 0.3862
Epoch 270/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0106 -
accuracy: 0.4276
Epoch 271/2000
10/10 [=====] - 1s 109ms/step - loss: 2.0044 -
accuracy: 0.3862
Epoch 272/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0012 -
accuracy: 0.4000
Epoch 273/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0022 -
accuracy: 0.4138
Epoch 274/2000
10/10 [=====] - 1s 107ms/step - loss: 2.0197 -
accuracy: 0.4034
Epoch 275/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0073 -
accuracy: 0.3966
Epoch 276/2000
10/10 [=====] - 1s 108ms/step - loss: 2.0056 -
accuracy: 0.3793
Epoch 277/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9944 -
accuracy: 0.3931

Epoch 278/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9778 -
accuracy: 0.4655
Epoch 279/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9917 -
accuracy: 0.4310
Epoch 280/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9679 -
accuracy: 0.4414
Epoch 281/2000
10/10 [=====] - 1s 109ms/step - loss: 1.9862 -
accuracy: 0.4448
Epoch 282/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9883 -
accuracy: 0.3724
Epoch 283/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9702 -
accuracy: 0.4414
Epoch 284/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9650 -
accuracy: 0.4103
Epoch 285/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9386 -
accuracy: 0.4759
Epoch 286/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9538 -
accuracy: 0.4138
Epoch 287/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9591 -
accuracy: 0.4414
Epoch 288/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9235 -
accuracy: 0.4759
Epoch 289/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9207 -
accuracy: 0.4517
Epoch 290/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9185 -
accuracy: 0.4552
Epoch 291/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9192 -
accuracy: 0.4759
Epoch 292/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9322 -
accuracy: 0.4310
Epoch 293/2000
10/10 [=====] - 1s 107ms/step - loss: 1.8991 -
accuracy: 0.4448

Epoch 294/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9162 -
accuracy: 0.4483
Epoch 295/2000
10/10 [=====] - 1s 108ms/step - loss: 1.9112 -
accuracy: 0.5000
Epoch 296/2000
10/10 [=====] - 1s 107ms/step - loss: 1.9077 -
accuracy: 0.4690
Epoch 297/2000
10/10 [=====] - 1s 106ms/step - loss: 1.9140 -
accuracy: 0.4172
Epoch 298/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8772 -
accuracy: 0.4724
Epoch 299/2000
10/10 [=====] - 1s 109ms/step - loss: 1.8960 -
accuracy: 0.4414
Epoch 300/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8895 -
accuracy: 0.4793
Epoch 301/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8940 -
accuracy: 0.4379
Epoch 302/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8922 -
accuracy: 0.4897
Epoch 303/2000
10/10 [=====] - 1s 109ms/step - loss: 1.8816 -
accuracy: 0.4862
Epoch 304/2000
10/10 [=====] - 1s 109ms/step - loss: 1.8844 -
accuracy: 0.4655
Epoch 305/2000
10/10 [=====] - 1s 107ms/step - loss: 1.8596 -
accuracy: 0.4655
Epoch 306/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8890 -
accuracy: 0.4724
Epoch 307/2000
10/10 [=====] - 1s 109ms/step - loss: 1.8412 -
accuracy: 0.5138
Epoch 308/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8414 -
accuracy: 0.5103
Epoch 309/2000
10/10 [=====] - 1s 107ms/step - loss: 1.8459 -
accuracy: 0.4793

Epoch 310/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8066 -
accuracy: 0.5172

Epoch 311/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8424 -
accuracy: 0.5207

Epoch 312/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8134 -
accuracy: 0.5034

Epoch 313/2000
10/10 [=====] - 1s 107ms/step - loss: 1.8210 -
accuracy: 0.4966

Epoch 314/2000
10/10 [=====] - 1s 107ms/step - loss: 1.8040 -
accuracy: 0.5276

Epoch 315/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8105 -
accuracy: 0.5000

Epoch 316/2000
10/10 [=====] - 1s 108ms/step - loss: 1.8283 -
accuracy: 0.4966

Epoch 317/2000
10/10 [=====] - 1s 107ms/step - loss: 1.8186 -
accuracy: 0.4931

Epoch 318/2000
10/10 [=====] - 1s 108ms/step - loss: 1.7632 -
accuracy: 0.5138

Epoch 319/2000
10/10 [=====] - 1s 108ms/step - loss: 1.7958 -
accuracy: 0.5103

Epoch 320/2000
10/10 [=====] - 1s 107ms/step - loss: 1.8061 -
accuracy: 0.5276

Epoch 321/2000
10/10 [=====] - 1s 110ms/step - loss: 1.7931 -
accuracy: 0.5379

Epoch 322/2000
10/10 [=====] - 1s 108ms/step - loss: 1.7895 -
accuracy: 0.5103

Epoch 323/2000
10/10 [=====] - 1s 108ms/step - loss: 1.7701 -
accuracy: 0.5138

Epoch 324/2000
10/10 [=====] - 1s 107ms/step - loss: 1.7705 -
accuracy: 0.5103

Epoch 325/2000
10/10 [=====] - 1s 107ms/step - loss: 1.7472 -
accuracy: 0.5414

Epoch 326/2000
10/10 [=====] - 1s 108ms/step - loss: 1.7215 -
accuracy: 0.5172
Epoch 327/2000
10/10 [=====] - 1s 109ms/step - loss: 1.7364 -
accuracy: 0.5586
Epoch 328/2000
10/10 [=====] - 1s 109ms/step - loss: 1.7727 -
accuracy: 0.5414
Epoch 329/2000
10/10 [=====] - 1s 108ms/step - loss: 1.7472 -
accuracy: 0.5241
Epoch 330/2000
10/10 [=====] - 1s 109ms/step - loss: 1.7051 -
accuracy: 0.5586
Epoch 331/2000
10/10 [=====] - 1s 109ms/step - loss: 1.7418 -
accuracy: 0.5138
Epoch 332/2000
10/10 [=====] - 1s 108ms/step - loss: 1.7313 -
accuracy: 0.5069
Epoch 333/2000
10/10 [=====] - 1s 109ms/step - loss: 1.7326 -
accuracy: 0.5517
Epoch 334/2000
10/10 [=====] - 1s 109ms/step - loss: 1.7138 -
accuracy: 0.5379
Epoch 335/2000
10/10 [=====] - 1s 109ms/step - loss: 1.6624 -
accuracy: 0.5621
Epoch 336/2000
10/10 [=====] - 1s 108ms/step - loss: 1.7030 -
accuracy: 0.5586
Epoch 337/2000
10/10 [=====] - 1s 109ms/step - loss: 1.6924 -
accuracy: 0.5724
Epoch 338/2000
10/10 [=====] - 1s 109ms/step - loss: 1.7078 -
accuracy: 0.5241
Epoch 339/2000
10/10 [=====] - 1s 109ms/step - loss: 1.6761 -
accuracy: 0.5552
Epoch 340/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6679 -
accuracy: 0.5448
Epoch 341/2000
10/10 [=====] - 1s 107ms/step - loss: 1.6772 -
accuracy: 0.5931

Epoch 342/2000
10/10 [=====] - 1s 110ms/step - loss: 1.6450 -
accuracy: 0.5724

Epoch 343/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6619 -
accuracy: 0.5414

Epoch 344/2000
10/10 [=====] - 1s 110ms/step - loss: 1.6668 -
accuracy: 0.5655

Epoch 345/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6637 -
accuracy: 0.5690

Epoch 346/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6558 -
accuracy: 0.5759

Epoch 347/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6417 -
accuracy: 0.5621

Epoch 348/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6189 -
accuracy: 0.5862

Epoch 349/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6173 -
accuracy: 0.6138

Epoch 350/2000
10/10 [=====] - 1s 109ms/step - loss: 1.6021 -
accuracy: 0.6103

Epoch 351/2000
10/10 [=====] - 1s 109ms/step - loss: 1.5616 -
accuracy: 0.6103

Epoch 352/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6127 -
accuracy: 0.5483

Epoch 353/2000
10/10 [=====] - 1s 109ms/step - loss: 1.6230 -
accuracy: 0.5724

Epoch 354/2000
10/10 [=====] - 1s 108ms/step - loss: 1.6123 -
accuracy: 0.5483

Epoch 355/2000
10/10 [=====] - 1s 107ms/step - loss: 1.6330 -
accuracy: 0.5241

Epoch 356/2000
10/10 [=====] - 1s 109ms/step - loss: 1.6030 -
accuracy: 0.5724

Epoch 357/2000
10/10 [=====] - 1s 107ms/step - loss: 1.5765 -
accuracy: 0.6000

Epoch 358/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5794 -
accuracy: 0.6034
Epoch 359/2000
10/10 [=====] - 1s 107ms/step - loss: 1.5586 -
accuracy: 0.6241
Epoch 360/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5670 -
accuracy: 0.6034
Epoch 361/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5819 -
accuracy: 0.5724
Epoch 362/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5068 -
accuracy: 0.6310
Epoch 363/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5726 -
accuracy: 0.6069
Epoch 364/2000
10/10 [=====] - 1s 109ms/step - loss: 1.5612 -
accuracy: 0.6276
Epoch 365/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5331 -
accuracy: 0.5828
Epoch 366/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5167 -
accuracy: 0.6414
Epoch 367/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5099 -
accuracy: 0.6414
Epoch 368/2000
10/10 [=====] - 1s 106ms/step - loss: 1.5333 -
accuracy: 0.5931
Epoch 369/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5422 -
accuracy: 0.5862
Epoch 370/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5276 -
accuracy: 0.6069
Epoch 371/2000
10/10 [=====] - 1s 108ms/step - loss: 1.5102 -
accuracy: 0.6241
Epoch 372/2000
10/10 [=====] - 1s 109ms/step - loss: 1.4969 -
accuracy: 0.6310
Epoch 373/2000
10/10 [=====] - 1s 109ms/step - loss: 1.5395 -
accuracy: 0.5966

Epoch 374/2000
10/10 [=====] - 1s 108ms/step - loss: 1.4635 -
accuracy: 0.6552

Epoch 375/2000
10/10 [=====] - 1s 107ms/step - loss: 1.4937 -
accuracy: 0.6414

Epoch 376/2000
10/10 [=====] - 1s 107ms/step - loss: 1.4978 -
accuracy: 0.5828

Epoch 377/2000
10/10 [=====] - 1s 108ms/step - loss: 1.4792 -
accuracy: 0.6345

Epoch 378/2000
10/10 [=====] - 1s 110ms/step - loss: 1.4588 -
accuracy: 0.6724

Epoch 379/2000
10/10 [=====] - 1s 109ms/step - loss: 1.4211 -
accuracy: 0.6483

Epoch 380/2000
10/10 [=====] - 1s 109ms/step - loss: 1.4138 -
accuracy: 0.6414

Epoch 381/2000
10/10 [=====] - 1s 108ms/step - loss: 1.4081 -
accuracy: 0.6655

Epoch 382/2000
10/10 [=====] - 1s 108ms/step - loss: 1.4782 -
accuracy: 0.6276

Epoch 383/2000
10/10 [=====] - 1s 109ms/step - loss: 1.4225 -
accuracy: 0.6655

Epoch 384/2000
10/10 [=====] - 1s 109ms/step - loss: 1.4457 -
accuracy: 0.5966

Epoch 385/2000
10/10 [=====] - 1s 110ms/step - loss: 1.4413 -
accuracy: 0.6379

Epoch 386/2000
10/10 [=====] - 1s 108ms/step - loss: 1.4338 -
accuracy: 0.6862

Epoch 387/2000
10/10 [=====] - 1s 110ms/step - loss: 1.3728 -
accuracy: 0.6966

Epoch 388/2000
10/10 [=====] - 1s 108ms/step - loss: 1.4169 -
accuracy: 0.6552

Epoch 389/2000
10/10 [=====] - 1s 107ms/step - loss: 1.3816 -
accuracy: 0.6828

Epoch 390/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3967 -
accuracy: 0.6724
Epoch 391/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3760 -
accuracy: 0.6621
Epoch 392/2000
10/10 [=====] - 1s 107ms/step - loss: 1.3548 -
accuracy: 0.6655
Epoch 393/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3682 -
accuracy: 0.6621
Epoch 394/2000
10/10 [=====] - 1s 108ms/step - loss: 1.3930 -
accuracy: 0.6724
Epoch 395/2000
10/10 [=====] - 1s 108ms/step - loss: 1.3673 -
accuracy: 0.7000
Epoch 396/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3618 -
accuracy: 0.7034
Epoch 397/2000
10/10 [=====] - 1s 110ms/step - loss: 1.3461 -
accuracy: 0.6793
Epoch 398/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3375 -
accuracy: 0.6759
Epoch 399/2000
10/10 [=====] - 1s 108ms/step - loss: 1.3844 -
accuracy: 0.6414
Epoch 400/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3226 -
accuracy: 0.6862
Epoch 401/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3451 -
accuracy: 0.6793
Epoch 402/2000
10/10 [=====] - 1s 110ms/step - loss: 1.3552 -
accuracy: 0.7138
Epoch 403/2000
10/10 [=====] - 1s 110ms/step - loss: 1.3301 -
accuracy: 0.6931
Epoch 404/2000
10/10 [=====] - 1s 110ms/step - loss: 1.3215 -
accuracy: 0.7069
Epoch 405/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3161 -
accuracy: 0.6862

Epoch 406/2000
10/10 [=====] - 1s 110ms/step - loss: 1.3154 -
accuracy: 0.7172
Epoch 407/2000
10/10 [=====] - 1s 109ms/step - loss: 1.2703 -
accuracy: 0.7034
Epoch 408/2000
10/10 [=====] - 1s 109ms/step - loss: 1.2824 -
accuracy: 0.7138
Epoch 409/2000
10/10 [=====] - 1s 109ms/step - loss: 1.3002 -
accuracy: 0.6862
Epoch 410/2000
10/10 [=====] - 1s 109ms/step - loss: 1.2663 -
accuracy: 0.7069
Epoch 411/2000
10/10 [=====] - 1s 109ms/step - loss: 1.2752 -
accuracy: 0.7103
Epoch 412/2000
10/10 [=====] - 1s 108ms/step - loss: 1.2237 -
accuracy: 0.7310
Epoch 413/2000
10/10 [=====] - 1s 109ms/step - loss: 1.2152 -
accuracy: 0.7379
Epoch 414/2000
10/10 [=====] - 1s 109ms/step - loss: 1.2527 -
accuracy: 0.7172
Epoch 415/2000
10/10 [=====] - 1s 109ms/step - loss: 1.2388 -
accuracy: 0.7207
Epoch 416/2000
10/10 [=====] - 1s 109ms/step - loss: 1.2166 -
accuracy: 0.7034
Epoch 417/2000
10/10 [=====] - 1s 110ms/step - loss: 1.2174 -
accuracy: 0.6966
Epoch 418/2000
10/10 [=====] - 1s 108ms/step - loss: 1.2586 -
accuracy: 0.7103
Epoch 419/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1832 -
accuracy: 0.7379
Epoch 420/2000
10/10 [=====] - 1s 110ms/step - loss: 1.1822 -
accuracy: 0.7241
Epoch 421/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1700 -
accuracy: 0.7310

Epoch 422/2000
10/10 [=====] - 1s 107ms/step - loss: 1.2269 -
accuracy: 0.7379
Epoch 423/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1432 -
accuracy: 0.7483
Epoch 424/2000
10/10 [=====] - 1s 108ms/step - loss: 1.1900 -
accuracy: 0.7517
Epoch 425/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1637 -
accuracy: 0.7552
Epoch 426/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1598 -
accuracy: 0.7483
Epoch 427/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1475 -
accuracy: 0.7690
Epoch 428/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1602 -
accuracy: 0.7138
Epoch 429/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1774 -
accuracy: 0.7379
Epoch 430/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1697 -
accuracy: 0.6793
Epoch 431/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1273 -
accuracy: 0.7483
Epoch 432/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0925 -
accuracy: 0.7690
Epoch 433/2000
10/10 [=====] - 1s 108ms/step - loss: 1.1858 -
accuracy: 0.7034
Epoch 434/2000
10/10 [=====] - 1s 108ms/step - loss: 1.1563 -
accuracy: 0.7172
Epoch 435/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1305 -
accuracy: 0.7586
Epoch 436/2000
10/10 [=====] - 1s 109ms/step - loss: 1.1331 -
accuracy: 0.7345
Epoch 437/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0872 -
accuracy: 0.7517

Epoch 438/2000
10/10 [=====] - 1s 107ms/step - loss: 1.1212 -
accuracy: 0.7483
Epoch 439/2000
10/10 [=====] - 1s 110ms/step - loss: 1.0838 -
accuracy: 0.7931
Epoch 440/2000
10/10 [=====] - 1s 110ms/step - loss: 1.1274 -
accuracy: 0.7552
Epoch 441/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0871 -
accuracy: 0.7655
Epoch 442/2000
10/10 [=====] - 1s 108ms/step - loss: 1.0653 -
accuracy: 0.7862
Epoch 443/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0899 -
accuracy: 0.7759
Epoch 444/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0717 -
accuracy: 0.7793
Epoch 445/2000
10/10 [=====] - 1s 107ms/step - loss: 1.0603 -
accuracy: 0.7897
Epoch 446/2000
10/10 [=====] - 1s 110ms/step - loss: 1.0551 -
accuracy: 0.7759
Epoch 447/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0323 -
accuracy: 0.7690
Epoch 448/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0457 -
accuracy: 0.7828
Epoch 449/2000
10/10 [=====] - 1s 108ms/step - loss: 1.0889 -
accuracy: 0.7379
Epoch 450/2000
10/10 [=====] - 1s 107ms/step - loss: 1.0571 -
accuracy: 0.7448
Epoch 451/2000
10/10 [=====] - 1s 107ms/step - loss: 1.0845 -
accuracy: 0.7586
Epoch 452/2000
10/10 [=====] - 1s 108ms/step - loss: 1.0551 -
accuracy: 0.7897
Epoch 453/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0517 -
accuracy: 0.7690

Epoch 454/2000
10/10 [=====] - 1s 110ms/step - loss: 0.9905 -
accuracy: 0.7759
Epoch 455/2000
10/10 [=====] - 1s 108ms/step - loss: 1.0483 -
accuracy: 0.7724
Epoch 456/2000
10/10 [=====] - 1s 109ms/step - loss: 1.0361 -
accuracy: 0.7690
Epoch 457/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9977 -
accuracy: 0.8276
Epoch 458/2000
10/10 [=====] - 1s 111ms/step - loss: 0.9988 -
accuracy: 0.8069
Epoch 459/2000
10/10 [=====] - 1s 110ms/step - loss: 0.9607 -
accuracy: 0.7966
Epoch 460/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9692 -
accuracy: 0.8103
Epoch 461/2000
10/10 [=====] - 1s 110ms/step - loss: 0.9989 -
accuracy: 0.8034
Epoch 462/2000
10/10 [=====] - 1s 108ms/step - loss: 0.9583 -
accuracy: 0.8276
Epoch 463/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9783 -
accuracy: 0.8172
Epoch 464/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9697 -
accuracy: 0.7931
Epoch 465/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9685 -
accuracy: 0.8172
Epoch 466/2000
10/10 [=====] - 1s 107ms/step - loss: 0.9822 -
accuracy: 0.8000
Epoch 467/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9365 -
accuracy: 0.8310
Epoch 468/2000
10/10 [=====] - 1s 108ms/step - loss: 0.9666 -
accuracy: 0.8241
Epoch 469/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9419 -
accuracy: 0.8241

Epoch 470/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9202 -
accuracy: 0.8345
Epoch 471/2000
10/10 [=====] - 1s 110ms/step - loss: 0.9287 -
accuracy: 0.8207
Epoch 472/2000
10/10 [=====] - 1s 109ms/step - loss: 0.9066 -
accuracy: 0.8414
Epoch 473/2000
10/10 [=====] - 1s 108ms/step - loss: 0.9234 -
accuracy: 0.8345
Epoch 474/2000
10/10 [=====] - 1s 108ms/step - loss: 0.9284 -
accuracy: 0.8207
Epoch 475/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8973 -
accuracy: 0.8379
Epoch 476/2000
10/10 [=====] - 1s 110ms/step - loss: 0.8912 -
accuracy: 0.8310
Epoch 477/2000
10/10 [=====] - 1s 110ms/step - loss: 0.8717 -
accuracy: 0.8207
Epoch 478/2000
10/10 [=====] - 1s 110ms/step - loss: 0.8818 -
accuracy: 0.8138
Epoch 479/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8749 -
accuracy: 0.8138
Epoch 480/2000
10/10 [=====] - 1s 108ms/step - loss: 0.8860 -
accuracy: 0.8207
Epoch 481/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8427 -
accuracy: 0.8345
Epoch 482/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8715 -
accuracy: 0.8069
Epoch 483/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8423 -
accuracy: 0.8276
Epoch 484/2000
10/10 [=====] - 1s 108ms/step - loss: 0.8586 -
accuracy: 0.8621
Epoch 485/2000
10/10 [=====] - 1s 108ms/step - loss: 0.8217 -
accuracy: 0.8621

Epoch 486/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8661 -
accuracy: 0.8310
Epoch 487/2000
10/10 [=====] - 1s 108ms/step - loss: 0.8432 -
accuracy: 0.8310
Epoch 488/2000
10/10 [=====] - 1s 108ms/step - loss: 0.8570 -
accuracy: 0.8034
Epoch 489/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8571 -
accuracy: 0.8207
Epoch 490/2000
10/10 [=====] - 1s 110ms/step - loss: 0.8428 -
accuracy: 0.8172
Epoch 491/2000
10/10 [=====] - 1s 107ms/step - loss: 0.8022 -
accuracy: 0.8517
Epoch 492/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8351 -
accuracy: 0.8310
Epoch 493/2000
10/10 [=====] - 1s 108ms/step - loss: 0.7911 -
accuracy: 0.8793
Epoch 494/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8199 -
accuracy: 0.8379
Epoch 495/2000
10/10 [=====] - 1s 108ms/step - loss: 0.8249 -
accuracy: 0.8207
Epoch 496/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7868 -
accuracy: 0.8552
Epoch 497/2000
10/10 [=====] - 1s 109ms/step - loss: 0.8129 -
accuracy: 0.8414
Epoch 498/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7731 -
accuracy: 0.8483
Epoch 499/2000
10/10 [=====] - 1s 108ms/step - loss: 0.8517 -
accuracy: 0.8345
Epoch 500/2000
10/10 [=====] - 1s 108ms/step - loss: 0.8261 -
accuracy: 0.8517
Epoch 501/2000
10/10 [=====] - 1s 108ms/step - loss: 0.7704 -
accuracy: 0.8793

Epoch 502/2000
10/10 [=====] - 1s 108ms/step - loss: 0.7379 -
accuracy: 0.8655

Epoch 503/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7593 -
accuracy: 0.8517

Epoch 504/2000
10/10 [=====] - 1s 110ms/step - loss: 0.7442 -
accuracy: 0.8690

Epoch 505/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7589 -
accuracy: 0.8586

Epoch 506/2000
10/10 [=====] - 1s 108ms/step - loss: 0.7149 -
accuracy: 0.8966

Epoch 507/2000
10/10 [=====] - 1s 110ms/step - loss: 0.7089 -
accuracy: 0.8724

Epoch 508/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7395 -
accuracy: 0.8586

Epoch 509/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7454 -
accuracy: 0.8759

Epoch 510/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6930 -
accuracy: 0.8966

Epoch 511/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7470 -
accuracy: 0.8897

Epoch 512/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6896 -
accuracy: 0.8862

Epoch 513/2000
10/10 [=====] - 1s 110ms/step - loss: 0.7460 -
accuracy: 0.8448

Epoch 514/2000
10/10 [=====] - 1s 110ms/step - loss: 0.7195 -
accuracy: 0.8483

Epoch 515/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7184 -
accuracy: 0.8759

Epoch 516/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6760 -
accuracy: 0.9069

Epoch 517/2000
10/10 [=====] - 1s 108ms/step - loss: 0.7165 -
accuracy: 0.8759

Epoch 518/2000
10/10 [=====] - 1s 108ms/step - loss: 0.6566 -
accuracy: 0.8862
Epoch 519/2000
10/10 [=====] - 1s 108ms/step - loss: 0.7098 -
accuracy: 0.9103
Epoch 520/2000
10/10 [=====] - 1s 107ms/step - loss: 0.7044 -
accuracy: 0.8690
Epoch 521/2000
10/10 [=====] - 1s 107ms/step - loss: 0.7124 -
accuracy: 0.8586
Epoch 522/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6696 -
accuracy: 0.9000
Epoch 523/2000
10/10 [=====] - 1s 110ms/step - loss: 0.6901 -
accuracy: 0.8690
Epoch 524/2000
10/10 [=====] - 1s 108ms/step - loss: 0.6682 -
accuracy: 0.8897
Epoch 525/2000
10/10 [=====] - 1s 108ms/step - loss: 0.6381 -
accuracy: 0.9138
Epoch 526/2000
10/10 [=====] - 1s 109ms/step - loss: 0.7006 -
accuracy: 0.8621
Epoch 527/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6587 -
accuracy: 0.8862
Epoch 528/2000
10/10 [=====] - 1s 108ms/step - loss: 0.6194 -
accuracy: 0.9138
Epoch 529/2000
10/10 [=====] - 1s 108ms/step - loss: 0.6530 -
accuracy: 0.9069
Epoch 530/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6230 -
accuracy: 0.8862
Epoch 531/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6382 -
accuracy: 0.8931
Epoch 532/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6273 -
accuracy: 0.9034
Epoch 533/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6254 -
accuracy: 0.9000

Epoch 534/2000
10/10 [=====] - 1s 110ms/step - loss: 0.6217 -
accuracy: 0.9069
Epoch 535/2000
10/10 [=====] - 1s 109ms/step - loss: 0.6151 -
accuracy: 0.9103
Epoch 536/2000
10/10 [=====] - 1s 108ms/step - loss: 0.6208 -
accuracy: 0.8862
Epoch 537/2000
10/10 [=====] - 1s 108ms/step - loss: 0.6413 -
accuracy: 0.8862
Epoch 538/2000
10/10 [=====] - 1s 110ms/step - loss: 0.6141 -
accuracy: 0.9000
Epoch 539/2000
10/10 [=====] - 1s 107ms/step - loss: 0.6218 -
accuracy: 0.8897
Epoch 540/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5853 -
accuracy: 0.9172
Epoch 541/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5766 -
accuracy: 0.9138
Epoch 542/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5454 -
accuracy: 0.9172
Epoch 543/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5736 -
accuracy: 0.9138
Epoch 544/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5799 -
accuracy: 0.9138
Epoch 545/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5445 -
accuracy: 0.9103
Epoch 546/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5640 -
accuracy: 0.9172
Epoch 547/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5782 -
accuracy: 0.9069
Epoch 548/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5749 -
accuracy: 0.9069
Epoch 549/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5745 -
accuracy: 0.9069

Epoch 550/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5581 -
accuracy: 0.8931
Epoch 551/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5438 -
accuracy: 0.9103
Epoch 552/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5688 -
accuracy: 0.9000
Epoch 553/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5647 -
accuracy: 0.9103
Epoch 554/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5755 -
accuracy: 0.9103
Epoch 555/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5673 -
accuracy: 0.8931
Epoch 556/2000
10/10 [=====] - 1s 110ms/step - loss: 0.5383 -
accuracy: 0.9241
Epoch 557/2000
10/10 [=====] - 1s 110ms/step - loss: 0.5107 -
accuracy: 0.9345
Epoch 558/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5201 -
accuracy: 0.9241
Epoch 559/2000
10/10 [=====] - 1s 110ms/step - loss: 0.5317 -
accuracy: 0.9276
Epoch 560/2000
10/10 [=====] - 1s 110ms/step - loss: 0.5257 -
accuracy: 0.9414
Epoch 561/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5018 -
accuracy: 0.9276
Epoch 562/2000
10/10 [=====] - 1s 108ms/step - loss: 0.5162 -
accuracy: 0.9276
Epoch 563/2000
10/10 [=====] - 1s 110ms/step - loss: 0.5351 -
accuracy: 0.9138
Epoch 564/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5073 -
accuracy: 0.9103
Epoch 565/2000
10/10 [=====] - 1s 109ms/step - loss: 0.5275 -
accuracy: 0.9276

Epoch 566/2000
10/10 [=====] - 1s 108ms/step - loss: 0.4868 -
accuracy: 0.9448

Epoch 567/2000
10/10 [=====] - 1s 107ms/step - loss: 0.4986 -
accuracy: 0.9379

Epoch 568/2000
10/10 [=====] - 1s 108ms/step - loss: 0.4918 -
accuracy: 0.9276

Epoch 569/2000
10/10 [=====] - 1s 107ms/step - loss: 0.4660 -
accuracy: 0.9414

Epoch 570/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4869 -
accuracy: 0.9172

Epoch 571/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4787 -
accuracy: 0.9310

Epoch 572/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4984 -
accuracy: 0.9310

Epoch 573/2000
10/10 [=====] - 1s 108ms/step - loss: 0.4812 -
accuracy: 0.9379

Epoch 574/2000
10/10 [=====] - 1s 108ms/step - loss: 0.4564 -
accuracy: 0.9345

Epoch 575/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4747 -
accuracy: 0.9207

Epoch 576/2000
10/10 [=====] - 1s 108ms/step - loss: 0.4483 -
accuracy: 0.9483

Epoch 577/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4839 -
accuracy: 0.9276

Epoch 578/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4653 -
accuracy: 0.9586

Epoch 579/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4523 -
accuracy: 0.9414

Epoch 580/2000
10/10 [=====] - 1s 108ms/step - loss: 0.4544 -
accuracy: 0.9414

Epoch 581/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4764 -
accuracy: 0.9276

Epoch 582/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4374 -
accuracy: 0.9483
Epoch 583/2000
10/10 [=====] - 1s 111ms/step - loss: 0.4351 -
accuracy: 0.9448
Epoch 584/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4341 -
accuracy: 0.9379
Epoch 585/2000
10/10 [=====] - 1s 111ms/step - loss: 0.4086 -
accuracy: 0.9552
Epoch 586/2000
10/10 [=====] - 1s 110ms/step - loss: 0.4074 -
accuracy: 0.9586
Epoch 587/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4080 -
accuracy: 0.9517
Epoch 588/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4268 -
accuracy: 0.9448
Epoch 589/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4304 -
accuracy: 0.9448
Epoch 590/2000
10/10 [=====] - 1s 111ms/step - loss: 0.3964 -
accuracy: 0.9655
Epoch 591/2000
10/10 [=====] - 1s 106ms/step - loss: 0.4039 -
accuracy: 0.9517
Epoch 592/2000
10/10 [=====] - 1s 110ms/step - loss: 0.4177 -
accuracy: 0.9552
Epoch 593/2000
10/10 [=====] - 1s 110ms/step - loss: 0.4040 -
accuracy: 0.9483
Epoch 594/2000
10/10 [=====] - 1s 108ms/step - loss: 0.4141 -
accuracy: 0.9517
Epoch 595/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4030 -
accuracy: 0.9483
Epoch 596/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3893 -
accuracy: 0.9448
Epoch 597/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3617 -
accuracy: 0.9621

Epoch 598/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3772 -
accuracy: 0.9586

Epoch 599/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3883 -
accuracy: 0.9586

Epoch 600/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3878 -
accuracy: 0.9483

Epoch 601/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3889 -
accuracy: 0.9483

Epoch 602/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3817 -
accuracy: 0.9621

Epoch 603/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3545 -
accuracy: 0.9724

Epoch 604/2000
10/10 [=====] - 1s 109ms/step - loss: 0.4031 -
accuracy: 0.9379

Epoch 605/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3521 -
accuracy: 0.9586

Epoch 606/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3679 -
accuracy: 0.9655

Epoch 607/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3551 -
accuracy: 0.9759

Epoch 608/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3757 -
accuracy: 0.9621

Epoch 609/2000
10/10 [=====] - 1s 111ms/step - loss: 0.3449 -
accuracy: 0.9690

Epoch 610/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3617 -
accuracy: 0.9483

Epoch 611/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3137 -
accuracy: 0.9690

Epoch 612/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3530 -
accuracy: 0.9552

Epoch 613/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3507 -
accuracy: 0.9690

Epoch 614/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3398 -
accuracy: 0.9724
Epoch 615/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3544 -
accuracy: 0.9690
Epoch 616/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3724 -
accuracy: 0.9655
Epoch 617/2000
10/10 [=====] - 1s 111ms/step - loss: 0.3626 -
accuracy: 0.9724
Epoch 618/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3329 -
accuracy: 0.9621
Epoch 619/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3233 -
accuracy: 0.9759
Epoch 620/2000
10/10 [=====] - 1s 107ms/step - loss: 0.3399 -
accuracy: 0.9655
Epoch 621/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3335 -
accuracy: 0.9793
Epoch 622/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2763 -
accuracy: 0.9759
Epoch 623/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3301 -
accuracy: 0.9690
Epoch 624/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3336 -
accuracy: 0.9690
Epoch 625/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3449 -
accuracy: 0.9552
Epoch 626/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3284 -
accuracy: 0.9552
Epoch 627/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3238 -
accuracy: 0.9552
Epoch 628/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3203 -
accuracy: 0.9690
Epoch 629/2000
10/10 [=====] - 1s 110ms/step - loss: 0.3160 -
accuracy: 0.9621

Epoch 630/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3119 -
accuracy: 0.9586
Epoch 631/2000
10/10 [=====] - 1s 111ms/step - loss: 0.3049 -
accuracy: 0.9724
Epoch 632/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2885 -
accuracy: 0.9759
Epoch 633/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3128 -
accuracy: 0.9621
Epoch 634/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2921 -
accuracy: 0.9759
Epoch 635/2000
10/10 [=====] - 1s 111ms/step - loss: 0.3007 -
accuracy: 0.9655
Epoch 636/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2992 -
accuracy: 0.9793
Epoch 637/2000
10/10 [=====] - 1s 108ms/step - loss: 0.3023 -
accuracy: 0.9724
Epoch 638/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2709 -
accuracy: 0.9759
Epoch 639/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2749 -
accuracy: 0.9724
Epoch 640/2000
10/10 [=====] - 1s 109ms/step - loss: 0.3033 -
accuracy: 0.9724
Epoch 641/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2799 -
accuracy: 0.9724
Epoch 642/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2927 -
accuracy: 0.9690
Epoch 643/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2994 -
accuracy: 0.9517
Epoch 644/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2732 -
accuracy: 0.9828
Epoch 645/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2502 -
accuracy: 0.9828

Epoch 646/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2549 -
accuracy: 0.9828
Epoch 647/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2573 -
accuracy: 0.9862
Epoch 648/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2383 -
accuracy: 0.9897
Epoch 649/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2413 -
accuracy: 0.9793
Epoch 650/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2403 -
accuracy: 0.9897
Epoch 651/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2469 -
accuracy: 0.9828
Epoch 652/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2699 -
accuracy: 0.9690
Epoch 653/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2352 -
accuracy: 0.9724
Epoch 654/2000
10/10 [=====] - 1s 112ms/step - loss: 0.2357 -
accuracy: 0.9759
Epoch 655/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2490 -
accuracy: 0.9724
Epoch 656/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2394 -
accuracy: 0.9690
Epoch 657/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2390 -
accuracy: 0.9793
Epoch 658/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2329 -
accuracy: 0.9862
Epoch 659/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2543 -
accuracy: 0.9897
Epoch 660/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2163 -
accuracy: 0.9828
Epoch 661/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2244 -
accuracy: 0.9828

Epoch 662/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2168 -
accuracy: 0.9862

Epoch 663/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1894 -
accuracy: 0.9966

Epoch 664/2000
10/10 [=====] - 1s 111ms/step - loss: 0.2489 -
accuracy: 0.9724

Epoch 665/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2376 -
accuracy: 0.9724

Epoch 666/2000
10/10 [=====] - 1s 108ms/step - loss: 0.2308 -
accuracy: 0.9759

Epoch 667/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2110 -
accuracy: 0.9793

Epoch 668/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2152 -
accuracy: 0.9897

Epoch 669/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2307 -
accuracy: 0.9828

Epoch 670/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2063 -
accuracy: 0.9828

Epoch 671/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2117 -
accuracy: 0.9828

Epoch 672/2000
10/10 [=====] - 1s 107ms/step - loss: 0.2003 -
accuracy: 0.9828

Epoch 673/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2219 -
accuracy: 0.9759

Epoch 674/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2176 -
accuracy: 0.9793

Epoch 675/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2057 -
accuracy: 0.9897

Epoch 676/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2120 -
accuracy: 0.9862

Epoch 677/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1988 -
accuracy: 0.9793

Epoch 678/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1906 -
accuracy: 0.9862
Epoch 679/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2085 -
accuracy: 0.9862
Epoch 680/2000
10/10 [=====] - 1s 111ms/step - loss: 0.2105 -
accuracy: 0.9655
Epoch 681/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2040 -
accuracy: 0.9828
Epoch 682/2000
10/10 [=====] - 1s 109ms/step - loss: 0.2037 -
accuracy: 0.9793
Epoch 683/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1837 -
accuracy: 0.9897
Epoch 684/2000
10/10 [=====] - 1s 110ms/step - loss: 0.2155 -
accuracy: 0.9690
Epoch 685/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1708 -
accuracy: 0.9966
Epoch 686/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1847 -
accuracy: 0.9897
Epoch 687/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1877 -
accuracy: 0.9897
Epoch 688/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1959 -
accuracy: 0.9828
Epoch 689/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1746 -
accuracy: 0.9931
Epoch 690/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1866 -
accuracy: 0.9828
Epoch 691/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1947 -
accuracy: 0.9931
Epoch 692/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1712 -
accuracy: 0.9862
Epoch 693/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1720 -
accuracy: 0.9862

Epoch 694/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1775 -
accuracy: 0.9828
Epoch 695/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1914 -
accuracy: 0.9759
Epoch 696/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1957 -
accuracy: 0.9897
Epoch 697/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1691 -
accuracy: 0.9862
Epoch 698/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1714 -
accuracy: 0.9897
Epoch 699/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1653 -
accuracy: 0.9897
Epoch 700/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1576 -
accuracy: 0.9897
Epoch 701/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1705 -
accuracy: 0.9966
Epoch 702/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1543 -
accuracy: 0.9931
Epoch 703/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1724 -
accuracy: 0.9897
Epoch 704/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1563 -
accuracy: 0.9897
Epoch 705/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1447 -
accuracy: 0.9931
Epoch 706/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1480 -
accuracy: 0.9897
Epoch 707/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1574 -
accuracy: 0.9966
Epoch 708/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1652 -
accuracy: 0.9828
Epoch 709/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1648 -
accuracy: 0.9931

Epoch 710/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1493 -
accuracy: 0.9862
Epoch 711/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1581 -
accuracy: 0.9897
Epoch 712/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1460 -
accuracy: 0.9931
Epoch 713/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1524 -
accuracy: 0.9897
Epoch 714/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1440 -
accuracy: 1.0000
Epoch 715/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1308 -
accuracy: 0.9897
Epoch 716/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1386 -
accuracy: 0.9966
Epoch 717/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1657 -
accuracy: 0.9828
Epoch 718/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1603 -
accuracy: 0.9724
Epoch 719/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1389 -
accuracy: 0.9931
Epoch 720/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1442 -
accuracy: 0.9931
Epoch 721/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1493 -
accuracy: 0.9862
Epoch 722/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1218 -
accuracy: 0.9931
Epoch 723/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1371 -
accuracy: 0.9931
Epoch 724/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1249 -
accuracy: 0.9966
Epoch 725/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1329 -
accuracy: 0.9931

Epoch 726/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1343 -
accuracy: 0.9862
Epoch 727/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1242 -
accuracy: 1.0000
Epoch 728/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1324 -
accuracy: 0.9931
Epoch 729/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1130 -
accuracy: 1.0000
Epoch 730/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1356 -
accuracy: 0.9897
Epoch 731/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1299 -
accuracy: 0.9966
Epoch 732/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1377 -
accuracy: 0.9931
Epoch 733/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1299 -
accuracy: 0.9897
Epoch 734/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1196 -
accuracy: 1.0000
Epoch 735/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1274 -
accuracy: 0.9931
Epoch 736/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1242 -
accuracy: 0.9931
Epoch 737/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1272 -
accuracy: 0.9966
Epoch 738/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1252 -
accuracy: 0.9966
Epoch 739/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1124 -
accuracy: 0.9966
Epoch 740/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1246 -
accuracy: 0.9931
Epoch 741/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1181 -
accuracy: 0.9966

Epoch 742/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1025 -
accuracy: 0.9966
Epoch 743/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1121 -
accuracy: 0.9931
Epoch 744/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1309 -
accuracy: 0.9897
Epoch 745/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1298 -
accuracy: 0.9897
Epoch 746/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1370 -
accuracy: 0.9862
Epoch 747/2000
10/10 [=====] - 1s 108ms/step - loss: 0.1123 -
accuracy: 0.9966
Epoch 748/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1063 -
accuracy: 0.9966
Epoch 749/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1244 -
accuracy: 0.9931
Epoch 750/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1207 -
accuracy: 1.0000
Epoch 751/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1232 -
accuracy: 0.9862
Epoch 752/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1191 -
accuracy: 0.9897
Epoch 753/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1070 -
accuracy: 0.9966
Epoch 754/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1062 -
accuracy: 0.9931
Epoch 755/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1261 -
accuracy: 0.9897
Epoch 756/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1015 -
accuracy: 0.9897
Epoch 757/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1126 -
accuracy: 1.0000

Epoch 758/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1057 -
accuracy: 0.9966
Epoch 759/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1074 -
accuracy: 0.9931
Epoch 760/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1096 -
accuracy: 0.9897
Epoch 761/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0919 -
accuracy: 0.9966
Epoch 762/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0992 -
accuracy: 1.0000
Epoch 763/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0878 -
accuracy: 0.9966
Epoch 764/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0878 -
accuracy: 0.9966
Epoch 765/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1061 -
accuracy: 0.9931
Epoch 766/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1112 -
accuracy: 0.9897
Epoch 767/2000
10/10 [=====] - 1s 111ms/step - loss: 0.1134 -
accuracy: 0.9897
Epoch 768/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1082 -
accuracy: 0.9966
Epoch 769/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1128 -
accuracy: 0.9966
Epoch 770/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0976 -
accuracy: 1.0000
Epoch 771/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1012 -
accuracy: 0.9966
Epoch 772/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1012 -
accuracy: 1.0000
Epoch 773/2000
10/10 [=====] - 1s 110ms/step - loss: 0.1089 -
accuracy: 0.9966

Epoch 774/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1005 -
accuracy: 0.9966
Epoch 775/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0961 -
accuracy: 1.0000
Epoch 776/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0896 -
accuracy: 1.0000
Epoch 777/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0990 -
accuracy: 0.9931
Epoch 778/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0842 -
accuracy: 1.0000
Epoch 779/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0923 -
accuracy: 0.9966
Epoch 780/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0726 -
accuracy: 1.0000
Epoch 781/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0877 -
accuracy: 0.9966
Epoch 782/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0854 -
accuracy: 1.0000
Epoch 783/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0856 -
accuracy: 0.9966
Epoch 784/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0845 -
accuracy: 0.9966
Epoch 785/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0872 -
accuracy: 0.9966
Epoch 786/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0920 -
accuracy: 0.9931
Epoch 787/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0835 -
accuracy: 1.0000
Epoch 788/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0829 -
accuracy: 1.0000
Epoch 789/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0771 -
accuracy: 0.9966

Epoch 790/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0776 -
accuracy: 1.0000
Epoch 791/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0747 -
accuracy: 1.0000
Epoch 792/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0738 -
accuracy: 0.9931
Epoch 793/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0810 -
accuracy: 0.9966
Epoch 794/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0732 -
accuracy: 1.0000
Epoch 795/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0960 -
accuracy: 0.9897
Epoch 796/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0804 -
accuracy: 1.0000
Epoch 797/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0840 -
accuracy: 1.0000
Epoch 798/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0916 -
accuracy: 0.9966
Epoch 799/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0895 -
accuracy: 0.9966
Epoch 800/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0738 -
accuracy: 0.9966
Epoch 801/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0707 -
accuracy: 1.0000
Epoch 802/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0711 -
accuracy: 1.0000
Epoch 803/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0729 -
accuracy: 0.9966
Epoch 804/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0695 -
accuracy: 0.9966
Epoch 805/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0791 -
accuracy: 0.9966

Epoch 806/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0639 -
accuracy: 1.0000
Epoch 807/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0665 -
accuracy: 1.0000
Epoch 808/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0648 -
accuracy: 1.0000
Epoch 809/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0701 -
accuracy: 1.0000
Epoch 810/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0577 -
accuracy: 0.9966
Epoch 811/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0636 -
accuracy: 1.0000
Epoch 812/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0619 -
accuracy: 1.0000
Epoch 813/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0683 -
accuracy: 1.0000
Epoch 814/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0668 -
accuracy: 0.9966
Epoch 815/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0673 -
accuracy: 0.9966
Epoch 816/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0511 -
accuracy: 0.9966
Epoch 817/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0799 -
accuracy: 0.9931
Epoch 818/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0731 -
accuracy: 0.9931
Epoch 819/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0625 -
accuracy: 0.9931
Epoch 820/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0687 -
accuracy: 0.9966
Epoch 821/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0695 -
accuracy: 1.0000

Epoch 822/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0720 -
accuracy: 0.9966
Epoch 823/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0733 -
accuracy: 0.9931
Epoch 824/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0544 -
accuracy: 1.0000
Epoch 825/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0606 -
accuracy: 1.0000
Epoch 826/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0538 -
accuracy: 1.0000
Epoch 827/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0606 -
accuracy: 1.0000
Epoch 828/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0537 -
accuracy: 1.0000
Epoch 829/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0666 -
accuracy: 0.9966
Epoch 830/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0587 -
accuracy: 0.9966
Epoch 831/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0651 -
accuracy: 1.0000
Epoch 832/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0570 -
accuracy: 0.9966
Epoch 833/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0629 -
accuracy: 0.9931
Epoch 834/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0639 -
accuracy: 0.9966
Epoch 835/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0560 -
accuracy: 1.0000
Epoch 836/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0633 -
accuracy: 1.0000
Epoch 837/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0529 -
accuracy: 1.0000

Epoch 838/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0635 -
accuracy: 0.9966
Epoch 839/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0649 -
accuracy: 0.9931
Epoch 840/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0566 -
accuracy: 0.9931
Epoch 841/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0580 -
accuracy: 1.0000
Epoch 842/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0570 -
accuracy: 0.9931
Epoch 843/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0544 -
accuracy: 0.9931
Epoch 844/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0543 -
accuracy: 1.0000
Epoch 845/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0537 -
accuracy: 0.9966
Epoch 846/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0495 -
accuracy: 1.0000
Epoch 847/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0490 -
accuracy: 0.9966
Epoch 848/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0459 -
accuracy: 0.9966
Epoch 849/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0507 -
accuracy: 1.0000
Epoch 850/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0537 -
accuracy: 1.0000
Epoch 851/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0518 -
accuracy: 0.9966
Epoch 852/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0526 -
accuracy: 1.0000
Epoch 853/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0534 -
accuracy: 0.9931

Epoch 854/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0532 -
accuracy: 1.0000
Epoch 855/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0524 -
accuracy: 1.0000
Epoch 856/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0416 -
accuracy: 1.0000
Epoch 857/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0482 -
accuracy: 1.0000
Epoch 858/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0466 -
accuracy: 1.0000
Epoch 859/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0459 -
accuracy: 1.0000
Epoch 860/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0422 -
accuracy: 1.0000
Epoch 861/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0541 -
accuracy: 1.0000
Epoch 862/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0555 -
accuracy: 0.9966
Epoch 863/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0576 -
accuracy: 0.9931
Epoch 864/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0491 -
accuracy: 1.0000
Epoch 865/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0460 -
accuracy: 0.9966
Epoch 866/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0588 -
accuracy: 1.0000
Epoch 867/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0386 -
accuracy: 1.0000
Epoch 868/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0420 -
accuracy: 1.0000
Epoch 869/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0475 -
accuracy: 1.0000

Epoch 870/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0433 -
accuracy: 1.0000
Epoch 871/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0398 -
accuracy: 1.0000
Epoch 872/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0331 -
accuracy: 1.0000
Epoch 873/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0328 -
accuracy: 1.0000
Epoch 874/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0395 -
accuracy: 1.0000
Epoch 875/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0349 -
accuracy: 0.9966
Epoch 876/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0412 -
accuracy: 1.0000
Epoch 877/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0383 -
accuracy: 1.0000
Epoch 878/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0353 -
accuracy: 1.0000
Epoch 879/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0445 -
accuracy: 0.9966
Epoch 880/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0435 -
accuracy: 1.0000
Epoch 881/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0433 -
accuracy: 1.0000
Epoch 882/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0461 -
accuracy: 1.0000
Epoch 883/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0417 -
accuracy: 1.0000
Epoch 884/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0386 -
accuracy: 1.0000
Epoch 885/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0380 -
accuracy: 1.0000

Epoch 886/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0364 -
accuracy: 0.9966
Epoch 887/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0321 -
accuracy: 1.0000
Epoch 888/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0294 -
accuracy: 1.0000
Epoch 889/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0370 -
accuracy: 1.0000
Epoch 890/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0404 -
accuracy: 0.9966
Epoch 891/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0432 -
accuracy: 0.9966
Epoch 892/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0452 -
accuracy: 1.0000
Epoch 893/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0466 -
accuracy: 0.9966
Epoch 894/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0360 -
accuracy: 0.9966
Epoch 895/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0306 -
accuracy: 1.0000
Epoch 896/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0524 -
accuracy: 1.0000
Epoch 897/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0379 -
accuracy: 0.9966
Epoch 898/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0369 -
accuracy: 1.0000
Epoch 899/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0424 -
accuracy: 1.0000
Epoch 900/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0315 -
accuracy: 1.0000
Epoch 901/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0327 -
accuracy: 1.0000

Epoch 902/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0498 -
accuracy: 0.9966
Epoch 903/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0352 -
accuracy: 1.0000
Epoch 904/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0317 -
accuracy: 1.0000
Epoch 905/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0295 -
accuracy: 1.0000
Epoch 906/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0334 -
accuracy: 1.0000
Epoch 907/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0292 -
accuracy: 1.0000
Epoch 908/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0324 -
accuracy: 1.0000
Epoch 909/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0370 -
accuracy: 0.9966
Epoch 910/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0318 -
accuracy: 0.9966
Epoch 911/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0321 -
accuracy: 0.9966
Epoch 912/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0338 -
accuracy: 1.0000
Epoch 913/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0398 -
accuracy: 0.9931
Epoch 914/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0294 -
accuracy: 1.0000
Epoch 915/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0376 -
accuracy: 1.0000
Epoch 916/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0356 -
accuracy: 0.9966
Epoch 917/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0306 -
accuracy: 1.0000

Epoch 918/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0336 -
accuracy: 1.0000

Epoch 919/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0307 -
accuracy: 1.0000

Epoch 920/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0294 -
accuracy: 1.0000

Epoch 921/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0292 -
accuracy: 0.9966

Epoch 922/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0374 -
accuracy: 0.9966

Epoch 923/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0267 -
accuracy: 1.0000

Epoch 924/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0339 -
accuracy: 0.9966

Epoch 925/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0267 -
accuracy: 1.0000

Epoch 926/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0285 -
accuracy: 0.9966

Epoch 927/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0246 -
accuracy: 1.0000

Epoch 928/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0253 -
accuracy: 1.0000

Epoch 929/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0311 -
accuracy: 1.0000

Epoch 930/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0273 -
accuracy: 1.0000

Epoch 931/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0264 -
accuracy: 1.0000

Epoch 932/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0254 -
accuracy: 1.0000

Epoch 933/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0377 -
accuracy: 0.9966

Epoch 934/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0304 -
accuracy: 1.0000
Epoch 935/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0269 -
accuracy: 0.9966
Epoch 936/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0249 -
accuracy: 1.0000
Epoch 937/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0211 -
accuracy: 1.0000
Epoch 938/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0306 -
accuracy: 1.0000
Epoch 939/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0251 -
accuracy: 1.0000
Epoch 940/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0280 -
accuracy: 1.0000
Epoch 941/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0258 -
accuracy: 0.9966
Epoch 942/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0281 -
accuracy: 0.9966
Epoch 943/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0250 -
accuracy: 1.0000
Epoch 944/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0230 -
accuracy: 1.0000
Epoch 945/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0253 -
accuracy: 1.0000
Epoch 946/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0227 -
accuracy: 1.0000
Epoch 947/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0262 -
accuracy: 1.0000
Epoch 948/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0220 -
accuracy: 1.0000
Epoch 949/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0268 -
accuracy: 1.0000

Epoch 950/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0260 -
accuracy: 1.0000
Epoch 951/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0220 -
accuracy: 1.0000
Epoch 952/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0309 -
accuracy: 1.0000
Epoch 953/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0269 -
accuracy: 1.0000
Epoch 954/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0209 -
accuracy: 1.0000
Epoch 955/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0260 -
accuracy: 0.9966
Epoch 956/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0452 -
accuracy: 0.9931
Epoch 957/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0426 -
accuracy: 1.0000
Epoch 958/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0355 -
accuracy: 0.9966
Epoch 959/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0374 -
accuracy: 0.9966
Epoch 960/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0287 -
accuracy: 1.0000
Epoch 961/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0227 -
accuracy: 1.0000
Epoch 962/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0232 -
accuracy: 1.0000
Epoch 963/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0237 -
accuracy: 1.0000
Epoch 964/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0209 -
accuracy: 1.0000
Epoch 965/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0221 -
accuracy: 0.9966

Epoch 966/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0238 -
accuracy: 1.0000
Epoch 967/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0186 -
accuracy: 1.0000
Epoch 968/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0202 -
accuracy: 1.0000
Epoch 969/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0270 -
accuracy: 1.0000
Epoch 970/2000
10/10 [=====] - 1s 114ms/step - loss: 0.0193 -
accuracy: 1.0000
Epoch 971/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0246 -
accuracy: 1.0000
Epoch 972/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0272 -
accuracy: 0.9966
Epoch 973/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0187 -
accuracy: 1.0000
Epoch 974/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0226 -
accuracy: 1.0000
Epoch 975/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0192 -
accuracy: 1.0000
Epoch 976/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0207 -
accuracy: 1.0000
Epoch 977/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0194 -
accuracy: 0.9966
Epoch 978/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0206 -
accuracy: 1.0000
Epoch 979/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0226 -
accuracy: 1.0000
Epoch 980/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0193 -
accuracy: 1.0000
Epoch 981/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0243 -
accuracy: 0.9966

Epoch 982/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0168 -
accuracy: 1.0000
Epoch 983/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0213 -
accuracy: 1.0000
Epoch 984/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0193 -
accuracy: 1.0000
Epoch 985/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0207 -
accuracy: 1.0000
Epoch 986/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0192 -
accuracy: 1.0000
Epoch 987/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0216 -
accuracy: 1.0000
Epoch 988/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0178 -
accuracy: 1.0000
Epoch 989/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0176 -
accuracy: 1.0000
Epoch 990/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0168 -
accuracy: 1.0000
Epoch 991/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0179 -
accuracy: 1.0000
Epoch 992/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0124 -
accuracy: 1.0000
Epoch 993/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0156 -
accuracy: 1.0000
Epoch 994/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0181 -
accuracy: 1.0000
Epoch 995/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0167 -
accuracy: 1.0000
Epoch 996/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0162 -
accuracy: 1.0000
Epoch 997/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0162 -
accuracy: 1.0000

Epoch 998/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0177 -
accuracy: 1.0000
Epoch 999/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0205 -
accuracy: 1.0000
Epoch 1000/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0217 -
accuracy: 1.0000
Epoch 1001/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0213 -
accuracy: 1.0000
Epoch 1002/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0180 -
accuracy: 1.0000
Epoch 1003/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0163 -
accuracy: 1.0000
Epoch 1004/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0233 -
accuracy: 0.9966
Epoch 1005/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0252 -
accuracy: 0.9966
Epoch 1006/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0193 -
accuracy: 1.0000
Epoch 1007/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0257 -
accuracy: 1.0000
Epoch 1008/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0251 -
accuracy: 1.0000
Epoch 1009/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0182 -
accuracy: 1.0000
Epoch 1010/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0148 -
accuracy: 1.0000
Epoch 1011/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0227 -
accuracy: 1.0000
Epoch 1012/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0163 -
accuracy: 1.0000
Epoch 1013/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0197 -
accuracy: 1.0000

Epoch 1014/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0169 -
accuracy: 1.0000
Epoch 1015/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0146 -
accuracy: 1.0000
Epoch 1016/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0151 -
accuracy: 1.0000
Epoch 1017/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0183 -
accuracy: 1.0000
Epoch 1018/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0146 -
accuracy: 1.0000
Epoch 1019/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0144 -
accuracy: 1.0000
Epoch 1020/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0174 -
accuracy: 0.9966
Epoch 1021/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0222 -
accuracy: 1.0000
Epoch 1022/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0159 -
accuracy: 1.0000
Epoch 1023/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0116 -
accuracy: 1.0000
Epoch 1024/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0180 -
accuracy: 1.0000
Epoch 1025/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0165 -
accuracy: 0.9966
Epoch 1026/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0197 -
accuracy: 1.0000
Epoch 1027/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0125 -
accuracy: 1.0000
Epoch 1028/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0147 -
accuracy: 1.0000
Epoch 1029/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0185 -
accuracy: 1.0000

Epoch 1030/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0117 -
accuracy: 1.0000
Epoch 1031/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0126 -
accuracy: 1.0000
Epoch 1032/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0127 -
accuracy: 1.0000
Epoch 1033/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0116 -
accuracy: 1.0000
Epoch 1034/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0204 -
accuracy: 1.0000
Epoch 1035/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0681 -
accuracy: 0.9793
Epoch 1036/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0541 -
accuracy: 0.9966
Epoch 1037/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0286 -
accuracy: 1.0000
Epoch 1038/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0268 -
accuracy: 0.9966
Epoch 1039/2000
10/10 [=====] - 1s 113ms/step - loss: 0.0256 -
accuracy: 1.0000
Epoch 1040/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0274 -
accuracy: 0.9966
Epoch 1041/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0195 -
accuracy: 1.0000
Epoch 1042/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0188 -
accuracy: 1.0000
Epoch 1043/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0265 -
accuracy: 0.9966
Epoch 1044/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0256 -
accuracy: 0.9966
Epoch 1045/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0182 -
accuracy: 1.0000

Epoch 1046/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0170 -
accuracy: 1.0000

Epoch 1047/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0140 -
accuracy: 1.0000

Epoch 1048/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0148 -
accuracy: 1.0000

Epoch 1049/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0142 -
accuracy: 1.0000

Epoch 1050/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0128 -
accuracy: 1.0000

Epoch 1051/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0217 -
accuracy: 0.9966

Epoch 1052/2000
10/10 [=====] - 1s 109ms/step - loss: 0.1275 -
accuracy: 0.9621

Epoch 1053/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0581 -
accuracy: 1.0000

Epoch 1054/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0666 -
accuracy: 0.9931

Epoch 1055/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0400 -
accuracy: 1.0000

Epoch 1056/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0344 -
accuracy: 0.9966

Epoch 1057/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0263 -
accuracy: 1.0000

Epoch 1058/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0214 -
accuracy: 1.0000

Epoch 1059/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0195 -
accuracy: 1.0000

Epoch 1060/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0207 -
accuracy: 1.0000

Epoch 1061/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0151 -
accuracy: 1.0000

Epoch 1062/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0170 -
accuracy: 1.0000
Epoch 1063/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0179 -
accuracy: 1.0000
Epoch 1064/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0103 -
accuracy: 1.0000
Epoch 1065/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0154 -
accuracy: 1.0000
Epoch 1066/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0127 -
accuracy: 1.0000
Epoch 1067/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0209 -
accuracy: 1.0000
Epoch 1068/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0125 -
accuracy: 1.0000
Epoch 1069/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0141 -
accuracy: 1.0000
Epoch 1070/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0133 -
accuracy: 1.0000
Epoch 1071/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0155 -
accuracy: 1.0000
Epoch 1072/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0115 -
accuracy: 1.0000
Epoch 1073/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0153 -
accuracy: 0.9966
Epoch 1074/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0126 -
accuracy: 1.0000
Epoch 1075/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0115 -
accuracy: 1.0000
Epoch 1076/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0122 -
accuracy: 1.0000
Epoch 1077/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0136 -
accuracy: 1.0000

Epoch 1078/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0129 -
accuracy: 1.0000
Epoch 1079/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0105 -
accuracy: 1.0000
Epoch 1080/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0137 -
accuracy: 1.0000
Epoch 1081/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0116 -
accuracy: 1.0000
Epoch 1082/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0105 -
accuracy: 1.0000
Epoch 1083/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0104 -
accuracy: 1.0000
Epoch 1084/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0144 -
accuracy: 0.9966
Epoch 1085/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0112 -
accuracy: 1.0000
Epoch 1086/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0136 -
accuracy: 1.0000
Epoch 1087/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0117 -
accuracy: 1.0000
Epoch 1088/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0100 -
accuracy: 1.0000
Epoch 1089/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0106 -
accuracy: 1.0000
Epoch 1090/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0126 -
accuracy: 1.0000
Epoch 1091/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0109 -
accuracy: 1.0000
Epoch 1092/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0108 -
accuracy: 1.0000
Epoch 1093/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0103 -
accuracy: 1.0000

Epoch 1094/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0091 -
accuracy: 1.0000
Epoch 1095/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0260 -
accuracy: 0.9966
Epoch 1096/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0211 -
accuracy: 0.9966
Epoch 1097/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0131 -
accuracy: 1.0000
Epoch 1098/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0169 -
accuracy: 0.9966
Epoch 1099/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0121 -
accuracy: 1.0000
Epoch 1100/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0117 -
accuracy: 1.0000
Epoch 1101/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0131 -
accuracy: 1.0000
Epoch 1102/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0122 -
accuracy: 1.0000
Epoch 1103/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0091 -
accuracy: 1.0000
Epoch 1104/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0087 -
accuracy: 1.0000
Epoch 1105/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0111 -
accuracy: 1.0000
Epoch 1106/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0128 -
accuracy: 1.0000
Epoch 1107/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0111 -
accuracy: 1.0000
Epoch 1108/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0095 -
accuracy: 1.0000
Epoch 1109/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0078 -
accuracy: 1.0000

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Epoch 1110/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0098 -
accuracy: 0.9966
Epoch 1111/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0105 -
accuracy: 1.0000
Epoch 1112/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0086 -
accuracy: 1.0000
Epoch 1113/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0096 -
accuracy: 1.0000
Epoch 1114/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0101 -
accuracy: 1.0000
Epoch 1115/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0059 -
accuracy: 1.0000
Epoch 1116/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0094 -
accuracy: 1.0000
Epoch 1117/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0076 -
accuracy: 1.0000
Epoch 1118/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0087 -
accuracy: 1.0000
Epoch 1119/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0080 -
accuracy: 1.0000
Epoch 1120/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0090 -
accuracy: 1.0000
Epoch 1121/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0080 -
accuracy: 1.0000
Epoch 1122/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0073 -
accuracy: 1.0000
Epoch 1123/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0081 -
accuracy: 1.0000
Epoch 1124/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0082 -
accuracy: 1.0000
Epoch 1125/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0117 -
accuracy: 1.0000

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Epoch 1126/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0075 -
accuracy: 1.0000
Epoch 1127/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0074 -
accuracy: 1.0000
Epoch 1128/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0087 -
accuracy: 1.0000
Epoch 1129/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0090 -
accuracy: 1.0000
Epoch 1130/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0077 -
accuracy: 1.0000
Epoch 1131/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0083 -
accuracy: 1.0000
Epoch 1132/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0071 -
accuracy: 1.0000
Epoch 1133/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0075 -
accuracy: 1.0000
Epoch 1134/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0065 -
accuracy: 1.0000
Epoch 1135/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0068 -
accuracy: 1.0000
Epoch 1136/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0083 -
accuracy: 1.0000
Epoch 1137/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0079 -
accuracy: 1.0000
Epoch 1138/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0075 -
accuracy: 1.0000
Epoch 1139/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0141 -
accuracy: 0.9966
Epoch 1140/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0080 -
accuracy: 1.0000
Epoch 1141/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0076 -
accuracy: 1.0000

Epoch 1142/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0118 -
accuracy: 0.9966

Epoch 1143/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0078 -
accuracy: 1.0000

Epoch 1144/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0093 -
accuracy: 1.0000

Epoch 1145/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0084 -
accuracy: 1.0000

Epoch 1146/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0086 -
accuracy: 1.0000

Epoch 1147/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0087 -
accuracy: 1.0000

Epoch 1148/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0081 -
accuracy: 1.0000

Epoch 1149/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0081 -
accuracy: 1.0000

Epoch 1150/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0087 -
accuracy: 1.0000

Epoch 1151/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0084 -
accuracy: 1.0000

Epoch 1152/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0065 -
accuracy: 1.0000

Epoch 1153/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0103 -
accuracy: 1.0000

Epoch 1154/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0102 -
accuracy: 1.0000

Epoch 1155/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0109 -
accuracy: 1.0000

Epoch 1156/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0076 -
accuracy: 1.0000

Epoch 1157/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0109 -
accuracy: 1.0000

Epoch 1158/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0061 -
accuracy: 1.0000
Epoch 1159/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0077 -
accuracy: 1.0000
Epoch 1160/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0059 -
accuracy: 1.0000
Epoch 1161/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0074 -
accuracy: 1.0000
Epoch 1162/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0062 -
accuracy: 1.0000
Epoch 1163/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0060 -
accuracy: 1.0000
Epoch 1164/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0076 -
accuracy: 1.0000
Epoch 1165/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0076 -
accuracy: 1.0000
Epoch 1166/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0158 -
accuracy: 1.0000
Epoch 1167/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0056 -
accuracy: 1.0000
Epoch 1168/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0081 -
accuracy: 1.0000
Epoch 1169/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0079 -
accuracy: 1.0000
Epoch 1170/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0123 -
accuracy: 1.0000
Epoch 1171/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0061 -
accuracy: 1.0000
Epoch 1172/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0074 -
accuracy: 1.0000
Epoch 1173/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0095 -
accuracy: 1.0000

Epoch 1174/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0054 -
accuracy: 1.0000
Epoch 1175/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0070 -
accuracy: 1.0000
Epoch 1176/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0063 -
accuracy: 1.0000
Epoch 1177/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0056 -
accuracy: 1.0000
Epoch 1178/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0067 -
accuracy: 1.0000
Epoch 1179/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0073 -
accuracy: 1.0000
Epoch 1180/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0087 -
accuracy: 1.0000
Epoch 1181/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0066 -
accuracy: 1.0000
Epoch 1182/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0062 -
accuracy: 1.0000
Epoch 1183/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0051 -
accuracy: 1.0000
Epoch 1184/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0080 -
accuracy: 1.0000
Epoch 1185/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0048 -
accuracy: 1.0000
Epoch 1186/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0055 -
accuracy: 1.0000
Epoch 1187/2000
10/10 [=====] - 1s 113ms/step - loss: 0.0090 -
accuracy: 1.0000
Epoch 1188/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0084 -
accuracy: 1.0000
Epoch 1189/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0051 -
accuracy: 1.0000

Epoch 1190/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0056 -
accuracy: 1.0000
Epoch 1191/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0051 -
accuracy: 1.0000
Epoch 1192/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0050 -
accuracy: 1.0000
Epoch 1193/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0059 -
accuracy: 1.0000
Epoch 1194/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0051 -
accuracy: 1.0000
Epoch 1195/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0043 -
accuracy: 1.0000
Epoch 1196/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0084 -
accuracy: 1.0000
Epoch 1197/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0086 -
accuracy: 1.0000
Epoch 1198/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0056 -
accuracy: 1.0000
Epoch 1199/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0048 -
accuracy: 1.0000
Epoch 1200/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0064 -
accuracy: 1.0000
Epoch 1201/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0062 -
accuracy: 1.0000
Epoch 1202/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1203/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0053 -
accuracy: 1.0000
Epoch 1204/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0056 -
accuracy: 1.0000
Epoch 1205/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0056 -
accuracy: 1.0000

Epoch 1206/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0073 -
accuracy: 1.0000
Epoch 1207/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0079 -
accuracy: 1.0000
Epoch 1208/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0094 -
accuracy: 1.0000
Epoch 1209/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0063 -
accuracy: 1.0000
Epoch 1210/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0072 -
accuracy: 1.0000
Epoch 1211/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0087 -
accuracy: 1.0000
Epoch 1212/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0049 -
accuracy: 1.0000
Epoch 1213/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0053 -
accuracy: 1.0000
Epoch 1214/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0116 -
accuracy: 1.0000
Epoch 1215/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0059 -
accuracy: 1.0000
Epoch 1216/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0069 -
accuracy: 1.0000
Epoch 1217/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0088 -
accuracy: 1.0000
Epoch 1218/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0066 -
accuracy: 1.0000
Epoch 1219/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0076 -
accuracy: 1.0000
Epoch 1220/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0101 -
accuracy: 1.0000
Epoch 1221/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0068 -
accuracy: 1.0000

Epoch 1222/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0052 -
accuracy: 1.0000
Epoch 1223/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0052 -
accuracy: 1.0000
Epoch 1224/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0051 -
accuracy: 1.0000
Epoch 1225/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0051 -
accuracy: 1.0000
Epoch 1226/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0052 -
accuracy: 1.0000
Epoch 1227/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0151 -
accuracy: 0.9966
Epoch 1228/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0121 -
accuracy: 1.0000
Epoch 1229/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0056 -
accuracy: 1.0000
Epoch 1230/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0077 -
accuracy: 1.0000
Epoch 1231/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0088 -
accuracy: 1.0000
Epoch 1232/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0126 -
accuracy: 0.9966
Epoch 1233/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0130 -
accuracy: 0.9966
Epoch 1234/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0068 -
accuracy: 1.0000
Epoch 1235/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0149 -
accuracy: 0.9966
Epoch 1236/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0111 -
accuracy: 1.0000
Epoch 1237/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0070 -
accuracy: 1.0000

Epoch 1238/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0090 -
accuracy: 1.0000
Epoch 1239/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0066 -
accuracy: 1.0000
Epoch 1240/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0058 -
accuracy: 1.0000
Epoch 1241/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0066 -
accuracy: 1.0000
Epoch 1242/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0074 -
accuracy: 1.0000
Epoch 1243/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1244/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0048 -
accuracy: 1.0000
Epoch 1245/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0069 -
accuracy: 1.0000
Epoch 1246/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0049 -
accuracy: 1.0000
Epoch 1247/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0053 -
accuracy: 1.0000
Epoch 1248/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0062 -
accuracy: 1.0000
Epoch 1249/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0037 -
accuracy: 1.0000
Epoch 1250/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0037 -
accuracy: 1.0000
Epoch 1251/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0046 -
accuracy: 1.0000
Epoch 1252/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0045 -
accuracy: 1.0000
Epoch 1253/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0049 -
accuracy: 1.0000

Epoch 1254/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0047 -
accuracy: 1.0000
Epoch 1255/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0053 -
accuracy: 1.0000
Epoch 1256/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1257/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0040 -
accuracy: 1.0000
Epoch 1258/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1259/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0053 -
accuracy: 1.0000
Epoch 1260/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0039 -
accuracy: 1.0000
Epoch 1261/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0100 -
accuracy: 1.0000
Epoch 1262/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0065 -
accuracy: 1.0000
Epoch 1263/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0048 -
accuracy: 1.0000
Epoch 1264/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0066 -
accuracy: 1.0000
Epoch 1265/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1266/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1267/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0042 -
accuracy: 1.0000
Epoch 1268/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0040 -
accuracy: 1.0000
Epoch 1269/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0042 -
accuracy: 1.0000

Epoch 1270/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0031 -
accuracy: 1.0000
Epoch 1271/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1272/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0042 -
accuracy: 1.0000
Epoch 1273/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0036 -
accuracy: 1.0000
Epoch 1274/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0031 -
accuracy: 1.0000
Epoch 1275/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0036 -
accuracy: 1.0000
Epoch 1276/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0070 -
accuracy: 1.0000
Epoch 1277/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0049 -
accuracy: 1.0000
Epoch 1278/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0047 -
accuracy: 1.0000
Epoch 1279/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0044 -
accuracy: 1.0000
Epoch 1280/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0033 -
accuracy: 1.0000
Epoch 1281/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0040 -
accuracy: 1.0000
Epoch 1282/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0081 -
accuracy: 0.9966
Epoch 1283/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0052 -
accuracy: 1.0000
Epoch 1284/2000
10/10 [=====] - 1s 114ms/step - loss: 0.0049 -
accuracy: 1.0000
Epoch 1285/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0056 -
accuracy: 1.0000

Epoch 1286/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1287/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1288/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0055 -
accuracy: 1.0000
Epoch 1289/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0030 -
accuracy: 1.0000
Epoch 1290/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0039 -
accuracy: 1.0000
Epoch 1291/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0060 -
accuracy: 1.0000
Epoch 1292/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1293/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0065 -
accuracy: 1.0000
Epoch 1294/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0055 -
accuracy: 1.0000
Epoch 1295/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0045 -
accuracy: 1.0000
Epoch 1296/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1297/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0040 -
accuracy: 1.0000
Epoch 1298/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0037 -
accuracy: 1.0000
Epoch 1299/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0034 -
accuracy: 1.0000
Epoch 1300/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1301/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0042 -
accuracy: 1.0000

Epoch 1302/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0054 -
accuracy: 1.0000
Epoch 1303/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0040 -
accuracy: 1.0000
Epoch 1304/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0039 -
accuracy: 1.0000
Epoch 1305/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0044 -
accuracy: 1.0000
Epoch 1306/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1307/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0031 -
accuracy: 1.0000
Epoch 1308/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1309/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0046 -
accuracy: 1.0000
Epoch 1310/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1311/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1312/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0054 -
accuracy: 1.0000
Epoch 1313/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0031 -
accuracy: 1.0000
Epoch 1314/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1315/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0036 -
accuracy: 1.0000
Epoch 1316/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0036 -
accuracy: 1.0000
Epoch 1317/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0046 -
accuracy: 1.0000

Epoch 1318/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1319/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0048 -
accuracy: 1.0000
Epoch 1320/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1321/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0069 -
accuracy: 1.0000
Epoch 1322/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0040 -
accuracy: 1.0000
Epoch 1323/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0034 -
accuracy: 1.0000
Epoch 1324/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0031 -
accuracy: 1.0000
Epoch 1325/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1326/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0048 -
accuracy: 1.0000
Epoch 1327/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1328/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1329/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1330/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1331/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0047 -
accuracy: 1.0000
Epoch 1332/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0034 -
accuracy: 1.0000
Epoch 1333/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0051 -
accuracy: 1.0000

Epoch 1334/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0046 -
accuracy: 1.0000
Epoch 1335/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0039 -
accuracy: 1.0000
Epoch 1336/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0050 -
accuracy: 1.0000
Epoch 1337/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0037 -
accuracy: 1.0000
Epoch 1338/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0033 -
accuracy: 1.0000
Epoch 1339/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1340/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0044 -
accuracy: 1.0000
Epoch 1341/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0039 -
accuracy: 1.0000
Epoch 1342/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1343/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0039 -
accuracy: 1.0000
Epoch 1344/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1345/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0046 -
accuracy: 1.0000
Epoch 1346/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1347/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0034 -
accuracy: 1.0000
Epoch 1348/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0032 -
accuracy: 1.0000
Epoch 1349/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0026 -
accuracy: 1.0000

Epoch 1350/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0030 -
accuracy: 1.0000
Epoch 1351/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0042 -
accuracy: 1.0000
Epoch 1352/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1353/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1354/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0043 -
accuracy: 1.0000
Epoch 1355/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0026 -
accuracy: 1.0000
Epoch 1356/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0026 -
accuracy: 1.0000
Epoch 1357/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1358/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1359/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0032 -
accuracy: 1.0000
Epoch 1360/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1361/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1362/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1363/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1364/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0034 -
accuracy: 1.0000
Epoch 1365/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0016 -
accuracy: 1.0000

Epoch 1366/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1367/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1368/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0024 -
accuracy: 1.0000
Epoch 1369/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1370/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1371/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1372/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1373/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0027 -
accuracy: 1.0000
Epoch 1374/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1375/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1376/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1377/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0027 -
accuracy: 1.0000
Epoch 1378/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1379/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0027 -
accuracy: 1.0000
Epoch 1380/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1381/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0024 -
accuracy: 1.0000

Epoch 1382/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1383/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1384/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1385/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1386/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1387/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1388/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1389/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1390/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0031 -
accuracy: 1.0000
Epoch 1391/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0037 -
accuracy: 1.0000
Epoch 1392/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1393/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0033 -
accuracy: 1.0000
Epoch 1394/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0030 -
accuracy: 1.0000
Epoch 1395/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1396/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1397/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0030 -
accuracy: 1.0000

Epoch 1398/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0033 -
accuracy: 1.0000
Epoch 1399/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1400/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0032 -
accuracy: 1.0000
Epoch 1401/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1402/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1403/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1404/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1405/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0025 -
accuracy: 1.0000
Epoch 1406/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0055 -
accuracy: 1.0000
Epoch 1407/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0046 -
accuracy: 1.0000
Epoch 1408/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0066 -
accuracy: 0.9966
Epoch 1409/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0044 -
accuracy: 1.0000
Epoch 1410/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0030 -
accuracy: 1.0000
Epoch 1411/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0032 -
accuracy: 1.0000
Epoch 1412/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1413/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0027 -
accuracy: 1.0000

Epoch 1414/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0034 -
accuracy: 1.0000
Epoch 1415/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1416/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1417/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1418/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0032 -
accuracy: 1.0000
Epoch 1419/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1420/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1421/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1422/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0102 -
accuracy: 0.9966
Epoch 1423/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1424/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0036 -
accuracy: 1.0000
Epoch 1425/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1426/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0066 -
accuracy: 1.0000
Epoch 1427/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0050 -
accuracy: 1.0000
Epoch 1428/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0037 -
accuracy: 1.0000
Epoch 1429/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000

Epoch 1430/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1431/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0037 -
accuracy: 1.0000
Epoch 1432/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0031 -
accuracy: 1.0000
Epoch 1433/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1434/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0025 -
accuracy: 1.0000
Epoch 1435/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1436/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1437/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1438/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1439/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1440/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1441/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0027 -
accuracy: 1.0000
Epoch 1442/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1443/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1444/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1445/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0027 -
accuracy: 1.0000

Epoch 1446/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1447/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1448/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0044 -
accuracy: 1.0000
Epoch 1449/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0026 -
accuracy: 1.0000
Epoch 1450/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0037 -
accuracy: 1.0000
Epoch 1451/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0039 -
accuracy: 1.0000
Epoch 1452/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0034 -
accuracy: 1.0000
Epoch 1453/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1454/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0046 -
accuracy: 0.9966
Epoch 1455/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1456/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1457/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1458/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1459/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0030 -
accuracy: 1.0000
Epoch 1460/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1461/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0024 -
accuracy: 1.0000

Epoch 1462/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0027 -
accuracy: 1.0000
Epoch 1463/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0024 -
accuracy: 1.0000
Epoch 1464/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1465/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1466/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1467/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1468/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1469/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1470/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0025 -
accuracy: 1.0000
Epoch 1471/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1472/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1473/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0032 -
accuracy: 1.0000
Epoch 1474/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1475/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0014 -
accuracy: 1.0000
Epoch 1476/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1477/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0018 -
accuracy: 1.0000

Epoch 1478/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0024 -
accuracy: 1.0000
Epoch 1479/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1480/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1481/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1482/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1483/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0014 -
accuracy: 1.0000
Epoch 1484/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1485/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1486/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1487/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1488/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1489/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1490/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1491/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1492/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1493/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0013 -
accuracy: 1.0000

Epoch 1494/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0030 -
accuracy: 1.0000
Epoch 1495/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1496/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0030 -
accuracy: 1.0000
Epoch 1497/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1498/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1499/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1500/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1501/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1502/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0030 -
accuracy: 1.0000
Epoch 1503/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1504/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1505/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1506/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1507/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0032 -
accuracy: 1.0000
Epoch 1508/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1509/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0034 -
accuracy: 1.0000

Epoch 1510/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1511/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1512/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1513/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1514/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1515/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1516/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1517/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1518/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1519/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0014 -
accuracy: 1.0000
Epoch 1520/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1521/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1522/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1523/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1524/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1525/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0014 -
accuracy: 1.0000

Epoch 1526/2000
 10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
 accuracy: 1.0000
 Epoch 1527/2000
 10/10 [=====] - 1s 110ms/step - loss: 0.0021 -
 accuracy: 1.0000
 Epoch 1528/2000
 10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
 accuracy: 1.0000
 Epoch 1529/2000
 10/10 [=====] - 1s 110ms/step - loss: 0.0012 -
 accuracy: 1.0000
 Epoch 1530/2000
 10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
 accuracy: 1.0000
 Epoch 1531/2000
 10/10 [=====] - 1s 107ms/step - loss: 0.0011 -
 accuracy: 1.0000
 Epoch 1532/2000
 10/10 [=====] - 1s 110ms/step - loss: 0.0011 -
 accuracy: 1.0000
 Epoch 1533/2000
 10/10 [=====] - 1s 110ms/step - loss: 0.0014 -
 accuracy: 1.0000
 Epoch 1534/2000
 10/10 [=====] - 1s 108ms/step - loss: 0.0012 -
 accuracy: 1.0000
 Epoch 1535/2000
 10/10 [=====] - 1s 109ms/step - loss: 9.8308e-04 -
 accuracy: 1.0000
 Epoch 1536/2000
 10/10 [=====] - 1s 109ms/step - loss: 0.0014 -
 accuracy: 1.0000
 Epoch 1537/2000
 10/10 [=====] - 1s 110ms/step - loss: 9.8515e-04 -
 accuracy: 1.0000
 Epoch 1538/2000
 10/10 [=====] - 1s 109ms/step - loss: 9.2400e-04 -
 accuracy: 1.0000
 Epoch 1539/2000
 10/10 [=====] - 1s 108ms/step - loss: 8.1456e-04 -
 accuracy: 1.0000
 Epoch 1540/2000
 10/10 [=====] - 1s 110ms/step - loss: 0.0012 -
 accuracy: 1.0000
 Epoch 1541/2000
 10/10 [=====] - 1s 109ms/step - loss: 9.0222e-04 -
 accuracy: 1.0000

Epoch 1542/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1543/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1544/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1545/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1546/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1547/2000
10/10 [=====] - 1s 108ms/step - loss: 9.3241e-04 -
accuracy: 1.0000
Epoch 1548/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1549/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0087 -
accuracy: 1.0000
Epoch 1550/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0133 -
accuracy: 0.9966
Epoch 1551/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0106 -
accuracy: 1.0000
Epoch 1552/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0084 -
accuracy: 1.0000
Epoch 1553/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0063 -
accuracy: 1.0000
Epoch 1554/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0038 -
accuracy: 1.0000
Epoch 1555/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0047 -
accuracy: 1.0000
Epoch 1556/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0029 -
accuracy: 1.0000
Epoch 1557/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0031 -
accuracy: 1.0000

Epoch 1558/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1559/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1560/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1561/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1562/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1563/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1564/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1565/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1566/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1567/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1568/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0024 -
accuracy: 1.0000
Epoch 1569/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1570/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0027 -
accuracy: 1.0000
Epoch 1571/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1572/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1573/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0011 -
accuracy: 1.0000

Epoch 1574/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1575/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1576/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1577/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1578/2000
10/10 [=====] - 1s 110ms/step - loss: 9.5612e-04 -
accuracy: 1.0000
Epoch 1579/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0025 -
accuracy: 1.0000
Epoch 1580/2000
10/10 [=====] - 1s 109ms/step - loss: 9.9137e-04 -
accuracy: 1.0000
Epoch 1581/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1582/2000
10/10 [=====] - 1s 109ms/step - loss: 8.3798e-04 -
accuracy: 1.0000
Epoch 1583/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1584/2000
10/10 [=====] - 1s 107ms/step - loss: 8.9708e-04 -
accuracy: 1.0000
Epoch 1585/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1586/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1587/2000
10/10 [=====] - 1s 108ms/step - loss: 9.5680e-04 -
accuracy: 1.0000
Epoch 1588/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1589/2000
10/10 [=====] - 1s 108ms/step - loss: 5.7140e-04 -
accuracy: 1.0000

Epoch 1590/2000
10/10 [=====] - 1s 109ms/step - loss: 8.2835e-04 -
accuracy: 1.0000
Epoch 1591/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1592/2000
10/10 [=====] - 1s 110ms/step - loss: 7.2247e-04 -
accuracy: 1.0000
Epoch 1593/2000
10/10 [=====] - 1s 109ms/step - loss: 9.9186e-04 -
accuracy: 1.0000
Epoch 1594/2000
10/10 [=====] - 1s 111ms/step - loss: 8.1626e-04 -
accuracy: 1.0000
Epoch 1595/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0025 -
accuracy: 1.0000
Epoch 1596/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1597/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1598/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0033 -
accuracy: 1.0000
Epoch 1599/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1600/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0050 -
accuracy: 1.0000
Epoch 1601/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1602/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0032 -
accuracy: 1.0000
Epoch 1603/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1604/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1605/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0017 -
accuracy: 1.0000

Epoch 1606/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000

Epoch 1607/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0013 -
accuracy: 1.0000

Epoch 1608/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0014 -
accuracy: 1.0000

Epoch 1609/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0015 -
accuracy: 1.0000

Epoch 1610/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0011 -
accuracy: 1.0000

Epoch 1611/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0020 -
accuracy: 1.0000

Epoch 1612/2000
10/10 [=====] - 1s 109ms/step - loss: 7.5830e-04 -
accuracy: 1.0000

Epoch 1613/2000
10/10 [=====] - 1s 108ms/step - loss: 9.0799e-04 -
accuracy: 1.0000

Epoch 1614/2000
10/10 [=====] - 1s 109ms/step - loss: 9.4780e-04 -
accuracy: 1.0000

Epoch 1615/2000
10/10 [=====] - 1s 109ms/step - loss: 6.4330e-04 -
accuracy: 1.0000

Epoch 1616/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0011 -
accuracy: 1.0000

Epoch 1617/2000
10/10 [=====] - 1s 110ms/step - loss: 8.6676e-04 -
accuracy: 1.0000

Epoch 1618/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0011 -
accuracy: 1.0000

Epoch 1619/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0013 -
accuracy: 1.0000

Epoch 1620/2000
10/10 [=====] - 1s 108ms/step - loss: 9.0788e-04 -
accuracy: 1.0000

Epoch 1621/2000
10/10 [=====] - 1s 109ms/step - loss: 9.7792e-04 -
accuracy: 1.0000

Epoch 1622/2000
10/10 [=====] - 1s 108ms/step - loss: 7.7932e-04 -
accuracy: 1.0000
Epoch 1623/2000
10/10 [=====] - 1s 109ms/step - loss: 9.0476e-04 -
accuracy: 1.0000
Epoch 1624/2000
10/10 [=====] - 1s 107ms/step - loss: 9.9438e-04 -
accuracy: 1.0000
Epoch 1625/2000
10/10 [=====] - 1s 110ms/step - loss: 6.5099e-04 -
accuracy: 1.0000
Epoch 1626/2000
10/10 [=====] - 1s 110ms/step - loss: 6.8237e-04 -
accuracy: 1.0000
Epoch 1627/2000
10/10 [=====] - 1s 109ms/step - loss: 6.5916e-04 -
accuracy: 1.0000
Epoch 1628/2000
10/10 [=====] - 1s 111ms/step - loss: 7.8332e-04 -
accuracy: 1.0000
Epoch 1629/2000
10/10 [=====] - 1s 110ms/step - loss: 6.1529e-04 -
accuracy: 1.0000
Epoch 1630/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1631/2000
10/10 [=====] - 1s 108ms/step - loss: 8.9108e-04 -
accuracy: 1.0000
Epoch 1632/2000
10/10 [=====] - 1s 110ms/step - loss: 5.9814e-04 -
accuracy: 1.0000
Epoch 1633/2000
10/10 [=====] - 1s 109ms/step - loss: 7.0523e-04 -
accuracy: 1.0000
Epoch 1634/2000
10/10 [=====] - 1s 107ms/step - loss: 6.6523e-04 -
accuracy: 1.0000
Epoch 1635/2000
10/10 [=====] - 1s 108ms/step - loss: 7.0770e-04 -
accuracy: 1.0000
Epoch 1636/2000
10/10 [=====] - 1s 109ms/step - loss: 8.2419e-04 -
accuracy: 1.0000
Epoch 1637/2000
10/10 [=====] - 1s 107ms/step - loss: 8.4539e-04 -
accuracy: 1.0000

Epoch 1638/2000
10/10 [=====] - 1s 111ms/step - loss: 6.3673e-04 -
accuracy: 1.0000
Epoch 1639/2000
10/10 [=====] - 1s 108ms/step - loss: 7.0102e-04 -
accuracy: 1.0000
Epoch 1640/2000
10/10 [=====] - 1s 109ms/step - loss: 7.1891e-04 -
accuracy: 1.0000
Epoch 1641/2000
10/10 [=====] - 1s 107ms/step - loss: 8.4065e-04 -
accuracy: 1.0000
Epoch 1642/2000
10/10 [=====] - 1s 110ms/step - loss: 4.5531e-04 -
accuracy: 1.0000
Epoch 1643/2000
10/10 [=====] - 1s 108ms/step - loss: 5.5354e-04 -
accuracy: 1.0000
Epoch 1644/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1645/2000
10/10 [=====] - 1s 109ms/step - loss: 7.2536e-04 -
accuracy: 1.0000
Epoch 1646/2000
10/10 [=====] - 1s 109ms/step - loss: 4.6287e-04 -
accuracy: 1.0000
Epoch 1647/2000
10/10 [=====] - 1s 109ms/step - loss: 5.7433e-04 -
accuracy: 1.0000
Epoch 1648/2000
10/10 [=====] - 1s 107ms/step - loss: 6.6485e-04 -
accuracy: 1.0000
Epoch 1649/2000
10/10 [=====] - 1s 107ms/step - loss: 7.4848e-04 -
accuracy: 1.0000
Epoch 1650/2000
10/10 [=====] - 1s 108ms/step - loss: 9.6537e-04 -
accuracy: 1.0000
Epoch 1651/2000
10/10 [=====] - 1s 109ms/step - loss: 6.1813e-04 -
accuracy: 1.0000
Epoch 1652/2000
10/10 [=====] - 1s 109ms/step - loss: 5.9666e-04 -
accuracy: 1.0000
Epoch 1653/2000
10/10 [=====] - 1s 111ms/step - loss: 7.7272e-04 -
accuracy: 1.0000

Epoch 1654/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0013 -
accuracy: 1.0000

Epoch 1655/2000
10/10 [=====] - 1s 110ms/step - loss: 9.1210e-04 -
accuracy: 1.0000

Epoch 1656/2000
10/10 [=====] - 1s 109ms/step - loss: 5.4274e-04 -
accuracy: 1.0000

Epoch 1657/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0010 -
accuracy: 1.0000

Epoch 1658/2000
10/10 [=====] - 1s 110ms/step - loss: 9.1588e-04 -
accuracy: 1.0000

Epoch 1659/2000
10/10 [=====] - 1s 109ms/step - loss: 6.9542e-04 -
accuracy: 1.0000

Epoch 1660/2000
10/10 [=====] - 1s 110ms/step - loss: 8.6593e-04 -
accuracy: 1.0000

Epoch 1661/2000
10/10 [=====] - 1s 108ms/step - loss: 6.2163e-04 -
accuracy: 1.0000

Epoch 1662/2000
10/10 [=====] - 1s 112ms/step - loss: 6.0249e-04 -
accuracy: 1.0000

Epoch 1663/2000
10/10 [=====] - 1s 108ms/step - loss: 7.4136e-04 -
accuracy: 1.0000

Epoch 1664/2000
10/10 [=====] - 1s 110ms/step - loss: 7.7976e-04 -
accuracy: 1.0000

Epoch 1665/2000
10/10 [=====] - 1s 110ms/step - loss: 6.7383e-04 -
accuracy: 1.0000

Epoch 1666/2000
10/10 [=====] - 1s 110ms/step - loss: 6.0833e-04 -
accuracy: 1.0000

Epoch 1667/2000
10/10 [=====] - 1s 108ms/step - loss: 9.8722e-04 -
accuracy: 1.0000

Epoch 1668/2000
10/10 [=====] - 1s 112ms/step - loss: 9.4045e-04 -
accuracy: 1.0000

Epoch 1669/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
accuracy: 1.0000

Epoch 1670/2000
10/10 [=====] - 1s 108ms/step - loss: 6.2055e-04 -
accuracy: 1.0000
Epoch 1671/2000
10/10 [=====] - 1s 107ms/step - loss: 7.0586e-04 -
accuracy: 1.0000
Epoch 1672/2000
10/10 [=====] - 1s 108ms/step - loss: 5.6759e-04 -
accuracy: 1.0000
Epoch 1673/2000
10/10 [=====] - 1s 110ms/step - loss: 9.5270e-04 -
accuracy: 1.0000
Epoch 1674/2000
10/10 [=====] - 1s 111ms/step - loss: 7.4857e-04 -
accuracy: 1.0000
Epoch 1675/2000
10/10 [=====] - 1s 109ms/step - loss: 5.9967e-04 -
accuracy: 1.0000
Epoch 1676/2000
10/10 [=====] - 1s 108ms/step - loss: 8.1253e-04 -
accuracy: 1.0000
Epoch 1677/2000
10/10 [=====] - 1s 108ms/step - loss: 9.6711e-04 -
accuracy: 1.0000
Epoch 1678/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1679/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1680/2000
10/10 [=====] - 1s 112ms/step - loss: 6.7384e-04 -
accuracy: 1.0000
Epoch 1681/2000
10/10 [=====] - 1s 108ms/step - loss: 5.3932e-04 -
accuracy: 1.0000
Epoch 1682/2000
10/10 [=====] - 1s 108ms/step - loss: 4.9572e-04 -
accuracy: 1.0000
Epoch 1683/2000
10/10 [=====] - 1s 108ms/step - loss: 9.2142e-04 -
accuracy: 1.0000
Epoch 1684/2000
10/10 [=====] - 1s 111ms/step - loss: 4.7593e-04 -
accuracy: 1.0000
Epoch 1685/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0015 -
accuracy: 1.0000

Epoch 1686/2000
10/10 [=====] - 1s 109ms/step - loss: 5.8657e-04 -
accuracy: 1.0000
Epoch 1687/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1688/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1689/2000
10/10 [=====] - 1s 109ms/step - loss: 5.9786e-04 -
accuracy: 1.0000
Epoch 1690/2000
10/10 [=====] - 1s 109ms/step - loss: 5.6215e-04 -
accuracy: 1.0000
Epoch 1691/2000
10/10 [=====] - 1s 109ms/step - loss: 7.4325e-04 -
accuracy: 1.0000
Epoch 1692/2000
10/10 [=====] - 1s 110ms/step - loss: 6.7589e-04 -
accuracy: 1.0000
Epoch 1693/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0014 -
accuracy: 1.0000
Epoch 1694/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1695/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0020 -
accuracy: 1.0000
Epoch 1696/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1697/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1698/2000
10/10 [=====] - 1s 108ms/step - loss: 8.4777e-04 -
accuracy: 1.0000
Epoch 1699/2000
10/10 [=====] - 1s 108ms/step - loss: 7.5334e-04 -
accuracy: 1.0000
Epoch 1700/2000
10/10 [=====] - 1s 108ms/step - loss: 7.7918e-04 -
accuracy: 1.0000
Epoch 1701/2000
10/10 [=====] - 1s 109ms/step - loss: 9.7477e-04 -
accuracy: 1.0000

Epoch 1702/2000
10/10 [=====] - 1s 109ms/step - loss: 6.5257e-04 -
accuracy: 1.0000
Epoch 1703/2000
10/10 [=====] - 1s 109ms/step - loss: 5.3794e-04 -
accuracy: 1.0000
Epoch 1704/2000
10/10 [=====] - 1s 113ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1705/2000
10/10 [=====] - 1s 110ms/step - loss: 6.3842e-04 -
accuracy: 1.0000
Epoch 1706/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1707/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0051 -
accuracy: 1.0000
Epoch 1708/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0043 -
accuracy: 1.0000
Epoch 1709/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000
Epoch 1710/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1711/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1712/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1713/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0013 -
accuracy: 1.0000
Epoch 1714/2000
10/10 [=====] - 1s 109ms/step - loss: 9.3006e-04 -
accuracy: 1.0000
Epoch 1715/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0031 -
accuracy: 1.0000
Epoch 1716/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1717/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0042 -
accuracy: 1.0000

Epoch 1718/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0032 -
accuracy: 1.0000

Epoch 1719/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0032 -
accuracy: 1.0000

Epoch 1720/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0015 -
accuracy: 1.0000

Epoch 1721/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0028 -
accuracy: 1.0000

Epoch 1722/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0023 -
accuracy: 1.0000

Epoch 1723/2000
10/10 [=====] - 1s 109ms/step - loss: 9.2426e-04 -
accuracy: 1.0000

Epoch 1724/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0016 -
accuracy: 1.0000

Epoch 1725/2000
10/10 [=====] - 1s 110ms/step - loss: 9.8488e-04 -
accuracy: 1.0000

Epoch 1726/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0015 -
accuracy: 1.0000

Epoch 1727/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0012 -
accuracy: 1.0000

Epoch 1728/2000
10/10 [=====] - 1s 110ms/step - loss: 7.2077e-04 -
accuracy: 1.0000

Epoch 1729/2000
10/10 [=====] - 1s 108ms/step - loss: 6.9775e-04 -
accuracy: 1.0000

Epoch 1730/2000
10/10 [=====] - 1s 110ms/step - loss: 4.5895e-04 -
accuracy: 1.0000

Epoch 1731/2000
10/10 [=====] - 1s 109ms/step - loss: 8.2047e-04 -
accuracy: 1.0000

Epoch 1732/2000
10/10 [=====] - 1s 109ms/step - loss: 4.7675e-04 -
accuracy: 1.0000

Epoch 1733/2000
10/10 [=====] - 1s 111ms/step - loss: 6.8740e-04 -
accuracy: 1.0000

Epoch 1734/2000
10/10 [=====] - 1s 110ms/step - loss: 4.8431e-04 -
accuracy: 1.0000
Epoch 1735/2000
10/10 [=====] - 1s 110ms/step - loss: 6.7097e-04 -
accuracy: 1.0000
Epoch 1736/2000
10/10 [=====] - 1s 112ms/step - loss: 9.9742e-04 -
accuracy: 1.0000
Epoch 1737/2000
10/10 [=====] - 1s 110ms/step - loss: 4.5362e-04 -
accuracy: 1.0000
Epoch 1738/2000
10/10 [=====] - 1s 110ms/step - loss: 6.8770e-04 -
accuracy: 1.0000
Epoch 1739/2000
10/10 [=====] - 1s 109ms/step - loss: 6.7280e-04 -
accuracy: 1.0000
Epoch 1740/2000
10/10 [=====] - 1s 108ms/step - loss: 4.0842e-04 -
accuracy: 1.0000
Epoch 1741/2000
10/10 [=====] - 1s 110ms/step - loss: 5.2158e-04 -
accuracy: 1.0000
Epoch 1742/2000
10/10 [=====] - 1s 110ms/step - loss: 9.0735e-04 -
accuracy: 1.0000
Epoch 1743/2000
10/10 [=====] - 1s 109ms/step - loss: 5.8244e-04 -
accuracy: 1.0000
Epoch 1744/2000
10/10 [=====] - 1s 109ms/step - loss: 7.5331e-04 -
accuracy: 1.0000
Epoch 1745/2000
10/10 [=====] - 1s 112ms/step - loss: 4.8426e-04 -
accuracy: 1.0000
Epoch 1746/2000
10/10 [=====] - 1s 112ms/step - loss: 7.4610e-04 -
accuracy: 1.0000
Epoch 1747/2000
10/10 [=====] - 1s 109ms/step - loss: 7.4590e-04 -
accuracy: 1.0000
Epoch 1748/2000
10/10 [=====] - 1s 109ms/step - loss: 5.7535e-04 -
accuracy: 1.0000
Epoch 1749/2000
10/10 [=====] - 1s 109ms/step - loss: 4.5916e-04 -
accuracy: 1.0000

Epoch 1750/2000
10/10 [=====] - 1s 110ms/step - loss: 5.6990e-04 -
accuracy: 1.0000
Epoch 1751/2000
10/10 [=====] - 1s 109ms/step - loss: 6.1966e-04 -
accuracy: 1.0000
Epoch 1752/2000
10/10 [=====] - 1s 110ms/step - loss: 2.6152e-04 -
accuracy: 1.0000
Epoch 1753/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1754/2000
10/10 [=====] - 1s 110ms/step - loss: 6.2787e-04 -
accuracy: 1.0000
Epoch 1755/2000
10/10 [=====] - 1s 110ms/step - loss: 4.0284e-04 -
accuracy: 1.0000
Epoch 1756/2000
10/10 [=====] - 1s 110ms/step - loss: 3.6722e-04 -
accuracy: 1.0000
Epoch 1757/2000
10/10 [=====] - 1s 108ms/step - loss: 9.7767e-04 -
accuracy: 1.0000
Epoch 1758/2000
10/10 [=====] - 1s 109ms/step - loss: 4.9149e-04 -
accuracy: 1.0000
Epoch 1759/2000
10/10 [=====] - 1s 108ms/step - loss: 4.9514e-04 -
accuracy: 1.0000
Epoch 1760/2000
10/10 [=====] - 1s 108ms/step - loss: 8.8743e-04 -
accuracy: 1.0000
Epoch 1761/2000
10/10 [=====] - 1s 110ms/step - loss: 6.8291e-04 -
accuracy: 1.0000
Epoch 1762/2000
10/10 [=====] - 1s 109ms/step - loss: 4.2085e-04 -
accuracy: 1.0000
Epoch 1763/2000
10/10 [=====] - 1s 110ms/step - loss: 5.7438e-04 -
accuracy: 1.0000
Epoch 1764/2000
10/10 [=====] - 1s 110ms/step - loss: 4.5171e-04 -
accuracy: 1.0000
Epoch 1765/2000
10/10 [=====] - 1s 110ms/step - loss: 5.7297e-04 -
accuracy: 1.0000

Epoch 1766/2000
10/10 [=====] - 1s 111ms/step - loss: 5.8590e-04 -
accuracy: 1.0000
Epoch 1767/2000
10/10 [=====] - 1s 111ms/step - loss: 3.7367e-04 -
accuracy: 1.0000
Epoch 1768/2000
10/10 [=====] - 1s 110ms/step - loss: 4.4474e-04 -
accuracy: 1.0000
Epoch 1769/2000
10/10 [=====] - 1s 108ms/step - loss: 4.2266e-04 -
accuracy: 1.0000
Epoch 1770/2000
10/10 [=====] - 1s 109ms/step - loss: 5.3239e-04 -
accuracy: 1.0000
Epoch 1771/2000
10/10 [=====] - 1s 109ms/step - loss: 4.8885e-04 -
accuracy: 1.0000
Epoch 1772/2000
10/10 [=====] - 1s 110ms/step - loss: 2.5261e-04 -
accuracy: 1.0000
Epoch 1773/2000
10/10 [=====] - 1s 109ms/step - loss: 3.9329e-04 -
accuracy: 1.0000
Epoch 1774/2000
10/10 [=====] - 1s 107ms/step - loss: 5.7247e-04 -
accuracy: 1.0000
Epoch 1775/2000
10/10 [=====] - 1s 108ms/step - loss: 5.3016e-04 -
accuracy: 1.0000
Epoch 1776/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0014 -
accuracy: 1.0000
Epoch 1777/2000
10/10 [=====] - 1s 109ms/step - loss: 7.5148e-04 -
accuracy: 1.0000
Epoch 1778/2000
10/10 [=====] - 1s 110ms/step - loss: 5.4532e-04 -
accuracy: 1.0000
Epoch 1779/2000
10/10 [=====] - 1s 108ms/step - loss: 6.1893e-04 -
accuracy: 1.0000
Epoch 1780/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1781/2000
10/10 [=====] - 1s 111ms/step - loss: 4.4123e-04 -
accuracy: 1.0000

Epoch 1782/2000
10/10 [=====] - 1s 108ms/step - loss: 5.3817e-04 -
accuracy: 1.0000

Epoch 1783/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0010 -
accuracy: 1.0000

Epoch 1784/2000
10/10 [=====] - 1s 110ms/step - loss: 4.5316e-04 -
accuracy: 1.0000

Epoch 1785/2000
10/10 [=====] - 1s 109ms/step - loss: 5.2586e-04 -
accuracy: 1.0000

Epoch 1786/2000
10/10 [=====] - 1s 110ms/step - loss: 3.8290e-04 -
accuracy: 1.0000

Epoch 1787/2000
10/10 [=====] - 1s 109ms/step - loss: 6.4262e-04 -
accuracy: 1.0000

Epoch 1788/2000
10/10 [=====] - 1s 110ms/step - loss: 7.0374e-04 -
accuracy: 1.0000

Epoch 1789/2000
10/10 [=====] - 1s 109ms/step - loss: 3.8604e-04 -
accuracy: 1.0000

Epoch 1790/2000
10/10 [=====] - 1s 109ms/step - loss: 4.3999e-04 -
accuracy: 1.0000

Epoch 1791/2000
10/10 [=====] - 1s 109ms/step - loss: 4.5622e-04 -
accuracy: 1.0000

Epoch 1792/2000
10/10 [=====] - 1s 109ms/step - loss: 6.3677e-04 -
accuracy: 1.0000

Epoch 1793/2000
10/10 [=====] - 1s 109ms/step - loss: 4.9425e-04 -
accuracy: 1.0000

Epoch 1794/2000
10/10 [=====] - 1s 107ms/step - loss: 4.9216e-04 -
accuracy: 1.0000

Epoch 1795/2000
10/10 [=====] - 1s 108ms/step - loss: 3.2927e-04 -
accuracy: 1.0000

Epoch 1796/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0019 -
accuracy: 1.0000

Epoch 1797/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0070 -
accuracy: 0.9966

Epoch 1798/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0712 -
accuracy: 0.9828
Epoch 1799/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0480 -
accuracy: 0.9897
Epoch 1800/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0282 -
accuracy: 0.9966
Epoch 1801/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0105 -
accuracy: 1.0000
Epoch 1802/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0196 -
accuracy: 0.9931
Epoch 1803/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0118 -
accuracy: 1.0000
Epoch 1804/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0068 -
accuracy: 1.0000
Epoch 1805/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0024 -
accuracy: 1.0000
Epoch 1806/2000
10/10 [=====] - 1s 112ms/step - loss: 0.0041 -
accuracy: 1.0000
Epoch 1807/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0034 -
accuracy: 1.0000
Epoch 1808/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0023 -
accuracy: 1.0000
Epoch 1809/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0018 -
accuracy: 1.0000
Epoch 1810/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0039 -
accuracy: 0.9966
Epoch 1811/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0040 -
accuracy: 1.0000
Epoch 1812/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0042 -
accuracy: 1.0000
Epoch 1813/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0029 -
accuracy: 1.0000

Epoch 1814/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0024 -
accuracy: 1.0000
Epoch 1815/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0024 -
accuracy: 1.0000
Epoch 1816/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1817/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0104 -
accuracy: 0.9931
Epoch 1818/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0035 -
accuracy: 1.0000
Epoch 1819/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0021 -
accuracy: 1.0000
Epoch 1820/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1821/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1822/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1823/2000
10/10 [=====] - 1s 112ms/step - loss: 9.8953e-04 -
accuracy: 1.0000
Epoch 1824/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1825/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1826/2000
10/10 [=====] - 1s 108ms/step - loss: 7.9451e-04 -
accuracy: 1.0000
Epoch 1827/2000
10/10 [=====] - 1s 110ms/step - loss: 7.0583e-04 -
accuracy: 1.0000
Epoch 1828/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0014 -
accuracy: 1.0000
Epoch 1829/2000
10/10 [=====] - 1s 109ms/step - loss: 7.2135e-04 -
accuracy: 1.0000

Epoch 1830/2000
10/10 [=====] - 1s 110ms/step - loss: 7.9995e-04 -
accuracy: 1.0000
Epoch 1831/2000
10/10 [=====] - 1s 111ms/step - loss: 9.3744e-04 -
accuracy: 1.0000
Epoch 1832/2000
10/10 [=====] - 1s 109ms/step - loss: 9.4800e-04 -
accuracy: 1.0000
Epoch 1833/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1834/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0016 -
accuracy: 1.0000
Epoch 1835/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0022 -
accuracy: 1.0000
Epoch 1836/2000
10/10 [=====] - 1s 108ms/step - loss: 9.3858e-04 -
accuracy: 1.0000
Epoch 1837/2000
10/10 [=====] - 1s 110ms/step - loss: 7.0453e-04 -
accuracy: 1.0000
Epoch 1838/2000
10/10 [=====] - 1s 110ms/step - loss: 7.0476e-04 -
accuracy: 1.0000
Epoch 1839/2000
10/10 [=====] - 1s 109ms/step - loss: 9.5879e-04 -
accuracy: 1.0000
Epoch 1840/2000
10/10 [=====] - 1s 109ms/step - loss: 9.1904e-04 -
accuracy: 1.0000
Epoch 1841/2000
10/10 [=====] - 1s 110ms/step - loss: 8.7321e-04 -
accuracy: 1.0000
Epoch 1842/2000
10/10 [=====] - 1s 110ms/step - loss: 7.7028e-04 -
accuracy: 1.0000
Epoch 1843/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0033 -
accuracy: 1.0000
Epoch 1844/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1845/2000
10/10 [=====] - 1s 110ms/step - loss: 9.9671e-04 -
accuracy: 1.0000

Epoch 1846/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0017 -
accuracy: 1.0000
Epoch 1847/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1848/2000
10/10 [=====] - 1s 108ms/step - loss: 8.1563e-04 -
accuracy: 1.0000
Epoch 1849/2000
10/10 [=====] - 1s 109ms/step - loss: 7.4164e-04 -
accuracy: 1.0000
Epoch 1850/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1851/2000
10/10 [=====] - 1s 109ms/step - loss: 6.9234e-04 -
accuracy: 1.0000
Epoch 1852/2000
10/10 [=====] - 1s 108ms/step - loss: 8.8042e-04 -
accuracy: 1.0000
Epoch 1853/2000
10/10 [=====] - 1s 108ms/step - loss: 7.4257e-04 -
accuracy: 1.0000
Epoch 1854/2000
10/10 [=====] - 1s 109ms/step - loss: 6.8681e-04 -
accuracy: 1.0000
Epoch 1855/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1856/2000
10/10 [=====] - 1s 109ms/step - loss: 8.2220e-04 -
accuracy: 1.0000
Epoch 1857/2000
10/10 [=====] - 1s 108ms/step - loss: 7.8622e-04 -
accuracy: 1.0000
Epoch 1858/2000
10/10 [=====] - 1s 110ms/step - loss: 9.6425e-04 -
accuracy: 1.0000
Epoch 1859/2000
10/10 [=====] - 1s 109ms/step - loss: 6.2494e-04 -
accuracy: 1.0000
Epoch 1860/2000
10/10 [=====] - 1s 109ms/step - loss: 5.4522e-04 -
accuracy: 1.0000
Epoch 1861/2000
10/10 [=====] - 1s 107ms/step - loss: 5.6831e-04 -
accuracy: 1.0000

Epoch 1862/2000
10/10 [=====] - 1s 109ms/step - loss: 4.5639e-04 -
accuracy: 1.0000
Epoch 1863/2000
10/10 [=====] - 1s 108ms/step - loss: 5.7137e-04 -
accuracy: 1.0000
Epoch 1864/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1865/2000
10/10 [=====] - 1s 107ms/step - loss: 7.1628e-04 -
accuracy: 1.0000
Epoch 1866/2000
10/10 [=====] - 1s 108ms/step - loss: 6.2768e-04 -
accuracy: 1.0000
Epoch 1867/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0014 -
accuracy: 1.0000
Epoch 1868/2000
10/10 [=====] - 1s 107ms/step - loss: 6.3898e-04 -
accuracy: 1.0000
Epoch 1869/2000
10/10 [=====] - 1s 108ms/step - loss: 7.3186e-04 -
accuracy: 1.0000
Epoch 1870/2000
10/10 [=====] - 1s 108ms/step - loss: 8.0985e-04 -
accuracy: 1.0000
Epoch 1871/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0014 -
accuracy: 1.0000
Epoch 1872/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1873/2000
10/10 [=====] - 1s 108ms/step - loss: 6.7395e-04 -
accuracy: 1.0000
Epoch 1874/2000
10/10 [=====] - 1s 110ms/step - loss: 5.7375e-04 -
accuracy: 1.0000
Epoch 1875/2000
10/10 [=====] - 1s 109ms/step - loss: 8.4228e-04 -
accuracy: 1.0000
Epoch 1876/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0019 -
accuracy: 1.0000
Epoch 1877/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0012 -
accuracy: 1.0000

Epoch 1878/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0019 -
accuracy: 1.0000

Epoch 1879/2000
10/10 [=====] - 1s 110ms/step - loss: 0.0035 -
accuracy: 1.0000

Epoch 1880/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0013 -
accuracy: 1.0000

Epoch 1881/2000
10/10 [=====] - 1s 110ms/step - loss: 7.5654e-04 -
accuracy: 1.0000

Epoch 1882/2000
10/10 [=====] - 1s 109ms/step - loss: 6.0108e-04 -
accuracy: 1.0000

Epoch 1883/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0016 -
accuracy: 1.0000

Epoch 1884/2000
10/10 [=====] - 1s 109ms/step - loss: 5.8745e-04 -
accuracy: 1.0000

Epoch 1885/2000
10/10 [=====] - 1s 109ms/step - loss: 6.4134e-04 -
accuracy: 1.0000

Epoch 1886/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0013 -
accuracy: 1.0000

Epoch 1887/2000
10/10 [=====] - 1s 111ms/step - loss: 0.0010 -
accuracy: 1.0000

Epoch 1888/2000
10/10 [=====] - 1s 111ms/step - loss: 6.7968e-04 -
accuracy: 1.0000

Epoch 1889/2000
10/10 [=====] - 1s 109ms/step - loss: 6.2834e-04 -
accuracy: 1.0000

Epoch 1890/2000
10/10 [=====] - 1s 110ms/step - loss: 6.4292e-04 -
accuracy: 1.0000

Epoch 1891/2000
10/10 [=====] - 1s 109ms/step - loss: 7.3225e-04 -
accuracy: 1.0000

Epoch 1892/2000
10/10 [=====] - 1s 108ms/step - loss: 5.1346e-04 -
accuracy: 1.0000

Epoch 1893/2000
10/10 [=====] - 1s 109ms/step - loss: 4.2130e-04 -
accuracy: 1.0000

Epoch 1894/2000
10/10 [=====] - 1s 108ms/step - loss: 4.5615e-04 -
accuracy: 1.0000

Epoch 1895/2000
10/10 [=====] - 1s 108ms/step - loss: 4.2747e-04 -
accuracy: 1.0000

Epoch 1896/2000
10/10 [=====] - 1s 111ms/step - loss: 4.8478e-04 -
accuracy: 1.0000

Epoch 1897/2000
10/10 [=====] - 1s 110ms/step - loss: 4.6802e-04 -
accuracy: 1.0000

Epoch 1898/2000
10/10 [=====] - 1s 108ms/step - loss: 5.2331e-04 -
accuracy: 1.0000

Epoch 1899/2000
10/10 [=====] - 1s 112ms/step - loss: 5.0320e-04 -
accuracy: 1.0000

Epoch 1900/2000
10/10 [=====] - 1s 111ms/step - loss: 4.3109e-04 -
accuracy: 1.0000

Epoch 1901/2000
10/10 [=====] - 1s 110ms/step - loss: 4.1418e-04 -
accuracy: 1.0000

Epoch 1902/2000
10/10 [=====] - 1s 107ms/step - loss: 7.5447e-04 -
accuracy: 1.0000

Epoch 1903/2000
10/10 [=====] - 1s 110ms/step - loss: 5.6549e-04 -
accuracy: 1.0000

Epoch 1904/2000
10/10 [=====] - 1s 111ms/step - loss: 3.3699e-04 -
accuracy: 1.0000

Epoch 1905/2000
10/10 [=====] - 1s 108ms/step - loss: 4.5209e-04 -
accuracy: 1.0000

Epoch 1906/2000
10/10 [=====] - 1s 108ms/step - loss: 6.9263e-04 -
accuracy: 1.0000

Epoch 1907/2000
10/10 [=====] - 1s 109ms/step - loss: 9.3971e-04 -
accuracy: 1.0000

Epoch 1908/2000
10/10 [=====] - 1s 110ms/step - loss: 6.2292e-04 -
accuracy: 1.0000

Epoch 1909/2000
10/10 [=====] - 1s 111ms/step - loss: 6.1715e-04 -
accuracy: 1.0000

Epoch 1910/2000
10/10 [=====] - 1s 109ms/step - loss: 8.2832e-04 -
accuracy: 1.0000

Epoch 1911/2000
10/10 [=====] - 1s 108ms/step - loss: 6.1495e-04 -
accuracy: 1.0000

Epoch 1912/2000
10/10 [=====] - 1s 108ms/step - loss: 8.1560e-04 -
accuracy: 1.0000

Epoch 1913/2000
10/10 [=====] - 1s 110ms/step - loss: 3.4560e-04 -
accuracy: 1.0000

Epoch 1914/2000
10/10 [=====] - 1s 107ms/step - loss: 6.4567e-04 -
accuracy: 1.0000

Epoch 1915/2000
10/10 [=====] - 1s 109ms/step - loss: 4.9410e-04 -
accuracy: 1.0000

Epoch 1916/2000
10/10 [=====] - 1s 111ms/step - loss: 6.0185e-04 -
accuracy: 1.0000

Epoch 1917/2000
10/10 [=====] - 1s 109ms/step - loss: 4.4866e-04 -
accuracy: 1.0000

Epoch 1918/2000
10/10 [=====] - 1s 110ms/step - loss: 4.7177e-04 -
accuracy: 1.0000

Epoch 1919/2000
10/10 [=====] - 1s 110ms/step - loss: 5.8241e-04 -
accuracy: 1.0000

Epoch 1920/2000
10/10 [=====] - 1s 107ms/step - loss: 5.6881e-04 -
accuracy: 1.0000

Epoch 1921/2000
10/10 [=====] - 1s 111ms/step - loss: 6.4610e-04 -
accuracy: 1.0000

Epoch 1922/2000
10/10 [=====] - 1s 111ms/step - loss: 4.0459e-04 -
accuracy: 1.0000

Epoch 1923/2000
10/10 [=====] - 1s 107ms/step - loss: 4.5569e-04 -
accuracy: 1.0000

Epoch 1924/2000
10/10 [=====] - 1s 108ms/step - loss: 3.8951e-04 -
accuracy: 1.0000

Epoch 1925/2000
10/10 [=====] - 1s 111ms/step - loss: 5.2878e-04 -
accuracy: 1.0000

Epoch 1926/2000
10/10 [=====] - 1s 112ms/step - loss: 5.4097e-04 -
accuracy: 1.0000
Epoch 1927/2000
10/10 [=====] - 1s 111ms/step - loss: 3.3391e-04 -
accuracy: 1.0000
Epoch 1928/2000
10/10 [=====] - 1s 110ms/step - loss: 6.5608e-04 -
accuracy: 1.0000
Epoch 1929/2000
10/10 [=====] - 1s 109ms/step - loss: 3.0964e-04 -
accuracy: 1.0000
Epoch 1930/2000
10/10 [=====] - 1s 109ms/step - loss: 2.2214e-04 -
accuracy: 1.0000
Epoch 1931/2000
10/10 [=====] - 1s 111ms/step - loss: 5.1563e-04 -
accuracy: 1.0000
Epoch 1932/2000
10/10 [=====] - 1s 109ms/step - loss: 2.7005e-04 -
accuracy: 1.0000
Epoch 1933/2000
10/10 [=====] - 1s 110ms/step - loss: 4.3504e-04 -
accuracy: 1.0000
Epoch 1934/2000
10/10 [=====] - 1s 109ms/step - loss: 5.8168e-04 -
accuracy: 1.0000
Epoch 1935/2000
10/10 [=====] - 1s 108ms/step - loss: 5.6183e-04 -
accuracy: 1.0000
Epoch 1936/2000
10/10 [=====] - 1s 108ms/step - loss: 2.9112e-04 -
accuracy: 1.0000
Epoch 1937/2000
10/10 [=====] - 1s 108ms/step - loss: 3.0812e-04 -
accuracy: 1.0000
Epoch 1938/2000
10/10 [=====] - 1s 108ms/step - loss: 4.9678e-04 -
accuracy: 1.0000
Epoch 1939/2000
10/10 [=====] - 1s 108ms/step - loss: 4.0276e-04 -
accuracy: 1.0000
Epoch 1940/2000
10/10 [=====] - 1s 109ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1941/2000
10/10 [=====] - 1s 108ms/step - loss: 3.3887e-04 -
accuracy: 1.0000

Epoch 1942/2000
10/10 [=====] - 1s 109ms/step - loss: 3.5951e-04 -
accuracy: 1.0000
Epoch 1943/2000
10/10 [=====] - 1s 110ms/step - loss: 5.3921e-04 -
accuracy: 1.0000
Epoch 1944/2000
10/10 [=====] - 1s 109ms/step - loss: 6.8608e-04 -
accuracy: 1.0000
Epoch 1945/2000
10/10 [=====] - 1s 109ms/step - loss: 4.1093e-04 -
accuracy: 1.0000
Epoch 1946/2000
10/10 [=====] - 1s 110ms/step - loss: 3.9558e-04 -
accuracy: 1.0000
Epoch 1947/2000
10/10 [=====] - 1s 110ms/step - loss: 4.4557e-04 -
accuracy: 1.0000
Epoch 1948/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0011 -
accuracy: 1.0000
Epoch 1949/2000
10/10 [=====] - 1s 109ms/step - loss: 9.2861e-04 -
accuracy: 1.0000
Epoch 1950/2000
10/10 [=====] - 1s 108ms/step - loss: 6.6499e-04 -
accuracy: 1.0000
Epoch 1951/2000
10/10 [=====] - 1s 109ms/step - loss: 5.1469e-04 -
accuracy: 1.0000
Epoch 1952/2000
10/10 [=====] - 1s 109ms/step - loss: 6.2407e-04 -
accuracy: 1.0000
Epoch 1953/2000
10/10 [=====] - 1s 108ms/step - loss: 7.4174e-04 -
accuracy: 1.0000
Epoch 1954/2000
10/10 [=====] - 1s 108ms/step - loss: 4.4135e-04 -
accuracy: 1.0000
Epoch 1955/2000
10/10 [=====] - 1s 109ms/step - loss: 3.9022e-04 -
accuracy: 1.0000
Epoch 1956/2000
10/10 [=====] - 1s 110ms/step - loss: 6.8793e-04 -
accuracy: 1.0000
Epoch 1957/2000
10/10 [=====] - 1s 110ms/step - loss: 2.9283e-04 -
accuracy: 1.0000

Epoch 1958/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0012 -
accuracy: 1.0000

Epoch 1959/2000
10/10 [=====] - 1s 110ms/step - loss: 2.9737e-04 -
accuracy: 1.0000

Epoch 1960/2000
10/10 [=====] - 1s 108ms/step - loss: 4.9702e-04 -
accuracy: 1.0000

Epoch 1961/2000
10/10 [=====] - 1s 108ms/step - loss: 3.6423e-04 -
accuracy: 1.0000

Epoch 1962/2000
10/10 [=====] - 1s 108ms/step - loss: 2.9787e-04 -
accuracy: 1.0000

Epoch 1963/2000
10/10 [=====] - 1s 108ms/step - loss: 4.8914e-04 -
accuracy: 1.0000

Epoch 1964/2000
10/10 [=====] - 1s 108ms/step - loss: 4.2029e-04 -
accuracy: 1.0000

Epoch 1965/2000
10/10 [=====] - 1s 109ms/step - loss: 4.0244e-04 -
accuracy: 1.0000

Epoch 1966/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4659e-04 -
accuracy: 1.0000

Epoch 1967/2000
10/10 [=====] - 1s 109ms/step - loss: 2.7436e-04 -
accuracy: 1.0000

Epoch 1968/2000
10/10 [=====] - 1s 108ms/step - loss: 2.8533e-04 -
accuracy: 1.0000

Epoch 1969/2000
10/10 [=====] - 1s 108ms/step - loss: 2.6533e-04 -
accuracy: 1.0000

Epoch 1970/2000
10/10 [=====] - 1s 108ms/step - loss: 4.6244e-04 -
accuracy: 1.0000

Epoch 1971/2000
10/10 [=====] - 1s 109ms/step - loss: 2.7587e-04 -
accuracy: 1.0000

Epoch 1972/2000
10/10 [=====] - 1s 108ms/step - loss: 4.7206e-04 -
accuracy: 1.0000

Epoch 1973/2000
10/10 [=====] - 1s 109ms/step - loss: 4.1667e-04 -
accuracy: 1.0000

Epoch 1974/2000
10/10 [=====] - 1s 111ms/step - loss: 5.3214e-04 -
accuracy: 1.0000
Epoch 1975/2000
10/10 [=====] - 1s 108ms/step - loss: 2.4119e-04 -
accuracy: 1.0000
Epoch 1976/2000
10/10 [=====] - 1s 111ms/step - loss: 3.9546e-04 -
accuracy: 1.0000
Epoch 1977/2000
10/10 [=====] - 1s 108ms/step - loss: 6.1856e-04 -
accuracy: 1.0000
Epoch 1978/2000
10/10 [=====] - 1s 109ms/step - loss: 4.7782e-04 -
accuracy: 1.0000
Epoch 1979/2000
10/10 [=====] - 1s 108ms/step - loss: 3.4410e-04 -
accuracy: 1.0000
Epoch 1980/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0012 -
accuracy: 1.0000
Epoch 1981/2000
10/10 [=====] - 1s 108ms/step - loss: 0.0010 -
accuracy: 1.0000
Epoch 1982/2000
10/10 [=====] - 1s 109ms/step - loss: 4.2076e-04 -
accuracy: 1.0000
Epoch 1983/2000
10/10 [=====] - 1s 110ms/step - loss: 3.9577e-04 -
accuracy: 1.0000
Epoch 1984/2000
10/10 [=====] - 1s 112ms/step - loss: 3.3742e-04 -
accuracy: 1.0000
Epoch 1985/2000
10/10 [=====] - 1s 109ms/step - loss: 4.2191e-04 -
accuracy: 1.0000
Epoch 1986/2000
10/10 [=====] - 1s 107ms/step - loss: 6.0652e-04 -
accuracy: 1.0000
Epoch 1987/2000
10/10 [=====] - 1s 107ms/step - loss: 0.0015 -
accuracy: 1.0000
Epoch 1988/2000
10/10 [=====] - 1s 108ms/step - loss: 5.5744e-04 -
accuracy: 1.0000
Epoch 1989/2000
10/10 [=====] - 1s 109ms/step - loss: 8.9742e-04 -
accuracy: 1.0000


```

Epoch 1990/2000
10/10 [=====] - 1s 110ms/step - loss: 5.0429e-04 -
accuracy: 1.0000
Epoch 1991/2000
10/10 [=====] - 1s 107ms/step - loss: 7.9086e-04 -
accuracy: 1.0000
Epoch 1992/2000
10/10 [=====] - 1s 109ms/step - loss: 2.4927e-04 -
accuracy: 1.0000
Epoch 1993/2000
10/10 [=====] - 1s 110ms/step - loss: 6.7407e-04 -
accuracy: 1.0000
Epoch 1994/2000
10/10 [=====] - 1s 106ms/step - loss: 3.9507e-04 -
accuracy: 1.0000
Epoch 1995/2000
10/10 [=====] - 1s 108ms/step - loss: 2.8957e-04 -
accuracy: 1.0000
Epoch 1996/2000
10/10 [=====] - 1s 108ms/step - loss: 4.1498e-04 -
accuracy: 1.0000
Epoch 1997/2000
10/10 [=====] - 1s 110ms/step - loss: 4.8003e-04 -
accuracy: 1.0000
Epoch 1998/2000
10/10 [=====] - 1s 109ms/step - loss: 3.3590e-04 -
accuracy: 1.0000
Epoch 1999/2000
10/10 [=====] - 1s 108ms/step - loss: 5.0284e-04 -
accuracy: 1.0000
Epoch 2000/2000
10/10 [=====] - 1s 109ms/step - loss: 2.7567e-04 -
accuracy: 1.0000

```

```
[55]: model = load_model('/content/drive/MyDrive/Face_comparison/Face_comparison.h5')
```

```
[56]: print(labels)
```

```

['Xuan_Nghi', 'Hoai_Linh', 'Truong_Giang', 'Doan_Quoc_Dam', 'Quyen_Linh',
'Tien_Luat', 'Tran_Thanh', 'Viet_Anh', 'Duy_Hung', 'Anh_Tu', 'Kieu_Anh_Tuan',
'Thanh_Son']

```

```
[57]: classes = ['Xuan_Nghi', 'Hoai_Linh', 'Truong_Giang', 'Doan_Quoc_Dam',
↳ 'Quyen_Linh', 'Tien_Luat', 'Tran_Thanh', 'Viet_Anh', 'Duy_Hung', 'Anh_Tu',
↳ 'Kieu_Anh_Tuan', 'Thanh_Son']
```

```
[58]: import matplotlib.pyplot as plt
import numpy as np
img = load_img('1.jpg', target_size=(128,128))
plt.imshow(img)
imgRe = img_to_array(img)
imgRe = imgRe.reshape(1,128,128,3)
imgRe = imgRe.astype('float32')
imgRe /= 255
y_pred = model.predict(imgRe)
percentage = y_pred.max()
percentage = percentage * 100

print(y_pred)
y_classes = [np.argmax(element) for element in y_pred]
y_classes
print("Khuôn mặt giống:",classes[y_classes[0]])
print("Tỉ lệ chính xác:",percentage, "%")
```

```
[[1.1333944e-08 2.1311695e-09 1.7819091e-09 4.2001593e-09 7.1697251e-08
 1.3366817e-10 9.999976e-01 2.1642164e-11 1.0933723e-09 1.8336428e-10
 1.1277736e-10 6.1431265e-08]]
```

Khuôn mặt giống: Tran_Thanh

Tỉ lệ chính xác: 99.99997615814209 %



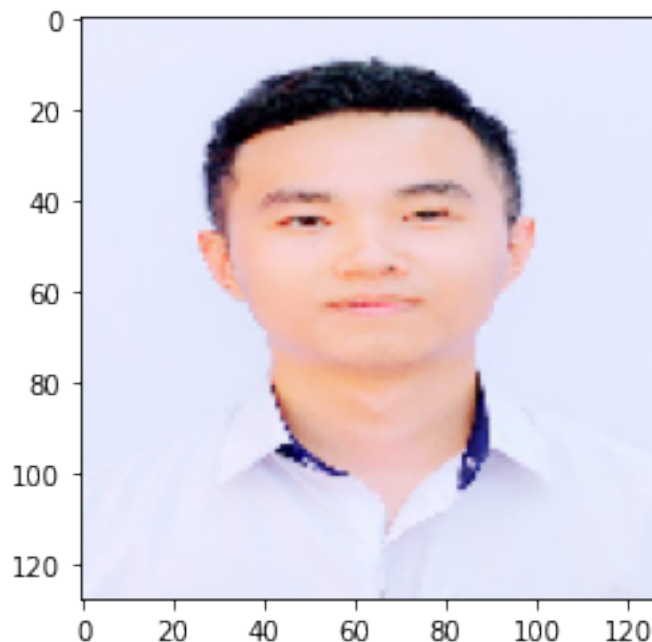
```
[61]: import matplotlib.pyplot as plt
import numpy as np
img = load_img('HINHTHE.jpg', target_size=(128,128))
plt.imshow(img)
imgRe = img_to_array(img)
imgRe = imgRe.reshape(1,128,128,3)
imgRe = imgRe.astype('float32')
imgRe /= 255
y_pred = model.predict(imgRe)
percentage = y_pred.max()
percentage = percentage * 100

print(y_pred)
y_classes = [np.argmax(element) for element in y_pred]
y_classes
print("Khuôn mặt giống:",classes[y_classes[0]])
print("Tỉ lệ chính xác:",percentage, "%")
```

```
[[1.7292370e-01 5.7085468e-05 2.2582306e-06 1.8647742e-04 3.2870194e-06
 1.6001521e-05 8.2646108e-01 9.7649013e-07 4.8085344e-06 5.8181518e-05
 6.2915551e-06 2.7986211e-04]]
```

Khuôn mặt giống: Tran_Thanh

Tỉ lệ chính xác: 82.64610767364502 %



```
[62]: import matplotlib.pyplot as plt
import numpy as np
img = load_img('12.jpg', target_size=(128,128))
plt.imshow(img)
imgRe = img_to_array(img)
imgRe = imgRe.reshape(1,128,128,3)
imgRe = imgRe.astype('float32')
imgRe /= 255
y_pred = model.predict(imgRe)
percentage = y_pred.max()
percentage = percentage * 100

print(y_pred)
y_classes = [np.argmax(element) for element in y_pred]
y_classes
print("Khuôn mặt giống:",classes[y_classes[0]])
print("Tỉ lệ chính xác:",percentage, "%")
```

```
[[2.5983319e-08 9.7304145e-08 1.4164326e-09 3.3435002e-10 9.4793506e-09
 7.1952516e-10 9.9999964e-01 1.5664327e-11 1.0477286e-08 2.0725263e-07
 2.5143518e-09 1.0619265e-08]]
```

Khuôn mặt giống: Tran_Thanh

Tỉ lệ chính xác: 99.99996423721313 %



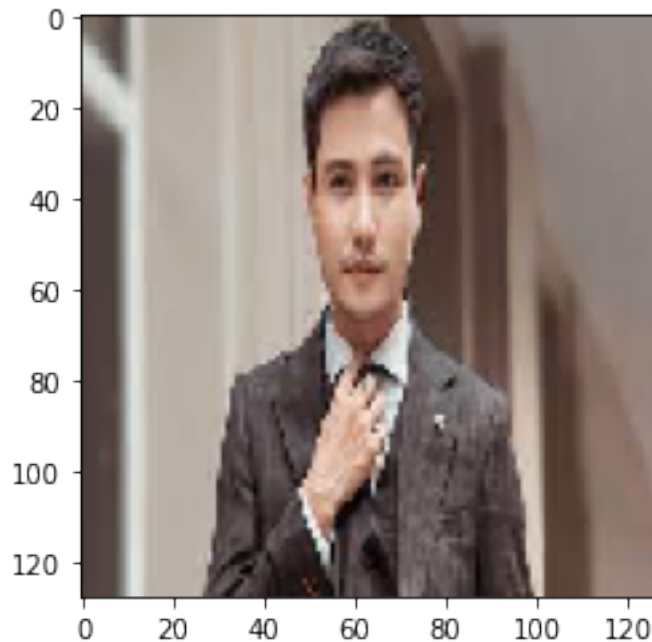
```
[63]: import matplotlib.pyplot as plt
import numpy as np
img = load_img('5.jpg', target_size=(128,128))
plt.imshow(img)
imgRe = img_to_array(img)
imgRe = imgRe.reshape(1,128,128,3)
imgRe = imgRe.astype('float32')
imgRe /= 255
y_pred = model.predict(imgRe)
percentage = y_pred.max()
percentage = percentage * 100

print(y_pred)
y_classes = [np.argmax(element) for element in y_pred]
y_classes
print("Khuôn mặt giống:",classes[y_classes[0]])
print("Tỉ lệ chính xác:",percentage, "%")
```

```
[[1.58485189e-08 9.09713371e-09 4.24133795e-09 7.47642126e-09
 2.65059863e-10 1.57112656e-09 1.09753735e-08 7.34737715e-10
 1.14476606e-08 7.38383410e-10 8.03941566e-11 1.00000000e+00]]
```

Khuôn mặt giống: Thanh_Son

Tỉ lệ chính xác: 100.0 %



```
[ ]: import matplotlib.pyplot as plt
import numpy as np
img = load_img('5.jpg', target_size=(128,128))
plt.imshow(img)
imgRe = img_to_array(img)
imgRe = imgRe.reshape(1,128,128,3)
imgRe = imgRe.astype('float32')
imgRe /= 255
y_pred = model.predict(imgRe)
percentage = y_pred.max()
percentage = percentage * 100

print(y_pred)
y_classes = [np.argmax(element) for element in y_pred]
y_classes
print("Khuôn mặt giống:", classes[y_classes[0]])
print("Tỉ lệ chính xác:", percentage, "%")
```

```
[ ]: from google.colab import drive
drive.mount('/content/drive')
!wget -nc https://raw.githubusercontent.com/brpy/colab-pdf/master/colab_pdf.py
from colab_pdf import colab_pdf
colab_pdf('Face_comparison.ipynb')
```

Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).

--2022-06-21 17:42:03-- https://raw.githubusercontent.com/brpy/colab-pdf/master/colab_pdf.py

Resolving raw.githubusercontent.com (raw.githubusercontent.com)...

185.199.108.133, 185.199.109.133, 185.199.110.133, ...

Connecting to raw.githubusercontent.com

(raw.githubusercontent.com)|185.199.108.133|:443... connected.

HTTP request sent, awaiting response... 200 OK

Length: 1864 (1.8K) [text/plain]

Saving to: 'colab_pdf.py'

colab_pdf.py 100%[=====>] 1.82K --.-KB/s in 0s

2022-06-21 17:42:04 (38.3 MB/s) - 'colab_pdf.py' saved [1864/1864]

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

Extracting templates from packages: 100%

[]: