Principal Component Analysis

The goal of this question is to build a conceptual understanding of dimensionality reduction using PCA and implement it on a toy dataset. You'll only have to use numpy and matplotlib for this question.

In [1]:
```python
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
import matplotlib.pyplot as plt
```

In [2]:
```python
# (a) Load data (features)
X = 0
def load_data(X):
    X = 'features.npy'
    data = np.load(X)

    mu = np.mean(data,axis=0)
    sigma = np.std(data,axis=0)
    data-=mu
    data/=sigma
    return data

test = load_data(X)
print(test.shape)
print('Mean: {}\nSTD: {}'.format(np.mean(test), np.std(test)))
```

```
(150, 8)
Mean: -6.158037043254202e-16
STD: 1.0
```

In [3]:
```python
# (b) Perform eigen decomposition and return eigen pairs in desecending order
def eigendecomp(X):
    covariance = np.cov(X.T)
#     print(covariance)
#     print(covariance.shape)
    sorted_eig_vals,sorted_eig_vecs = np.linalg.eig(covariance)
#     print(w,v)
    return (sorted_eig_vals, sorted_eig_vecs)
eigendecomp(test)
```

Out[3]: (array([4.74298961e+00, 2.29585309e+00, 7.76910512e-01, 2.04172901e-01,
                3.37651661e-02, -7.03281987e-16, 6.34199026e-18, 8.43406727e-16]),
         array([[-0.39124937, 0.13884872, -0.46160937, 0.58034539, 0.24934936,
                  0.20978664, -0.42116938, 0.09320476],
                [0.11687696, -0.4391715 , -0.78711289, -0.2905579 , -0.12725786,
                  0.07280114, 0.20605814, 0.14672413],
                [-0.40655289, 0.29080021, -0.13961871, -0.12636707, -0.54994554,
                 -0.59631459, -0.06875535, 0.21509872],
                [-0.39944906, 0.26454833, -0.16206048, -0.54404218, 0.49904279,
                 -0.06355642, 0.05521708, -0.43718158],
                [-0.3778555 , -0.35426671, 0.07790627, 0.42060984, 0.12822569,
                 -0.32964346, 0.66179491, -0.14645517],
                [-0.09816172, -0.64299795, 0.11941452, -0.04972667, -0.0795516 ,
                 -0.20011335, -0.56640575, -0.40331041],
                [-0.45509399, -0.03231459, 0.12200908, -0.08034689, -0.51935676,
                  0.65722825, 0.07577872, -0.23707109],
                [-0.38587285, -0.30545597, 0.29393481, -0.28457653, 0.27864817,
                  0.10197996, -0.08859901, 0.70148315]]))

In [4]:
```python
# (c) Evaluate using variance_explained as the metric
#ratio between sum of k eigenvalues and sum of all eigenvalues
def eval(X):
    eigenval,eigenvec = eigendecomp(X)

    for k in range(1,9):
        var_expl = np.sum(eigenval[0:k])
        var_tot = np.sum(eigenval)
        ratio = var_expl/var_tot
        print('Ratio:',ratio)
    print('Eigenvalue',eigenval)
eval(test)
```

```
Ratio: 0.5889212098295772
Ratio: 0.8739896347022311
Ratio: 0.9704560233211404
Ratio: 0.9958074918820439
Ratio: 1.0
Ratio: 1.0
Ratio: 1.0
Ratio: 1.0
Eigenvalue [ 4.74298961e+00  2.29585309e+00  7.76910512e-01  2.04172901e-01
   3.37651661e-02 -7.03281987e-16  6.34199026e-18  8.43406727e-16]
```

In [5]:

```python
def project(X):
    eigenval,eigenvec = eigendecomp(X)
#     print(eigenvec)
    eigenvector = np.column_stack((eigenvec[:,0],eigenvec[:,1]))
    print('eigenvector',eigenvector)
#     print(arr.shape)
#     print(X.shape)
    reduced_data = (np.matmul(X,eigenvector))
    return reduced_data
print('reduced_data',project(test))
```

```
eigenvector [[-0.39124937  0.13884872]
 [ 0.11687696 -0.4391715 ]
 [-0.40655289  0.29080021]
 [-0.39944906  0.26454833]
 [-0.3778555  -0.35426671]
 [-0.09816172 -0.64299795]
 [-0.45509399 -0.03231459]
 [-0.38587285 -0.30545597]]
reduced_data [[ 1.14283537 -2.75916236]
 [ 4.47917874  1.87206668]
 [ 2.36294554 -1.18487643]
 [ 2.11785321 -1.23400373]
 [ 2.35720963 -1.59610139]
 [ 2.11794046 -1.66871235]
 [ 2.59256157 -1.1733813 ]
 [ 1.69738736 -1.94274515]
 [ 3.84415322  0.91236648]
 [ 2.54114976 -0.61023934]
 [ 0.53307793 -3.52114295]
 [ 2.1342099  -1.52068107]
 [ 2.20338749 -0.9757627 ]
 [ 3.35078423 -0.23733063]
 [ 2.15681408 -2.04798058]
 [ 2.26610464 -2.28577345]
 [ 1.14461493 -3.08406768]
 [ 2.49984619 -1.06451121]
 [ 2.18818227 -1.28000327]
 [ 2.83611365 -1.13516124]
 [ 2.7612342  -0.24427366]
 [ 3.15987429 -0.47080825]
 [ 1.58717236 -3.08977007]
 [ 0.66469116 -2.43034637]
 [ 2.7406176  -0.60365427]
 [ 3.18585395  0.57768826]
 [ 0.81361677 -2.69041059]
 [ 2.8319995  -0.635948  ]
 [ 1.5236855  -2.05718464]
 [ 2.49499246 -0.82244322]
 [ 3.791253    0.94977631]
 [ 1.6103999  -1.51222567]
 [ 3.54346342 -0.9785532 ]
 [ 2.93280851 -1.59445256]
 [ 4.23927503  1.37510478]
```

```
[ 3.43117407   0.23166945]
[ 2.58921603  -0.82150777]
[ 2.76985217  -0.34285448]
[ 1.6173334   -1.9381603 ]
[ 2.23395945  -1.23642152]
[ 1.75067988  -2.08873766]
[ 2.79267307   0.86709121]
[ 1.74023069  -2.14990566]
[ 3.17847114   0.11295206]
[ 4.12713083   0.75973692]
[ 1.88802255  -1.12823371]
[ 0.623944    -3.76026107]
[ 2.85033664  -0.62469429]
[ 1.57186285  -2.38565561]
[ 1.79454623  -1.72078895]
[-1.81141033  -0.59303167]
[-0.19671106   0.79021338]
[-0.89276166   0.82653295]
[ 1.42975232   3.01725168]
[-0.76704061   0.98262477]
[ 0.53563806   1.5880808 ]
[ 0.11689792   1.14697328]
[ 0.86288386   0.89300451]
[-0.64077874   0.81528976]
[ 0.92841179   1.52203367]
[ 1.05511764   2.04630892]
[-0.45219697   0.24391029]
[ 0.46395778   2.13644889]
[-2.40742934  -1.46768404]
[ 0.33058612   0.46747946]
[-1.86848459  -0.92708591]
[ 0.26256682   1.05063124]
[-0.94171816  -0.48419685]
[-1.47260851   0.9176662 ]
[ 0.57256585   1.45306373]
[-1.57699445  -0.6861078 ]
[-2.24604408  -1.69485953]
[-1.52264838   0.68241772]
[-1.97882408  -1.00510469]
[-2.22760787  -1.40597853]
[ 0.97456275   2.49554929]
[-0.9760806    1.00580133]
[-1.39963675   0.53923257]
[-1.35747427  -0.3497214 ]
[ 0.18060287   0.51056642]
[ 0.34461951   1.21593044]
[ 1.77058821   2.70561789]
[-0.28925582   0.35615519]
[-2.08138365  -0.31642132]
[-0.39294209   0.12625758]
[-1.20532415  -0.95229301]
[-0.38477179   1.12374948]
[-1.51957044   0.47845785]
[-0.95558824  -0.86719815]
[-0.39527753   0.52810915]
[ 0.14437388   1.15060741]
[-1.64648773  -0.82510304]
```

```
[ 1.29930976   2.46047417]
[ 2.24785603   2.76894025]
[ 0.13605657   1.01158084]
[ 0.03469556   0.33081092]
[ 0.68078327   1.37200898]
[ 0.38178132   1.48676681]
[ 0.78699576   0.68462402]
[-0.24537126   0.39756981]
[-1.75175341   0.836874  ]
[-0.93719603   1.18765157]
[-3.8935865   -1.00393043]
[-2.95450856  -0.89267797]
[-1.5298337    1.32441284]
[-2.90357248   1.03397004]
[ 1.81110092   3.41291557]
[-1.64096172   1.91845919]
[-1.57399002   1.88688541]
[-4.51177198  -2.14279665]
[-2.72993696  -1.13579289]
[-1.26492019   1.41717621]
[-0.76465418   2.13983383]
[-0.15090453   2.42213493]
[-0.58474807   1.96258338]
[-3.16607528  -1.26164261]
[-1.65646998   0.53583669]
[-3.95218976  -1.35726227]
[-3.60131966   1.43234824]
[-1.64027473   0.91040176]
[-4.18658328  -1.78237345]
[-0.01335868   1.90145402]
[-3.11272766   1.18509785]
[-2.78310603  -0.82231002]
[-3.44714984  -1.46981494]
[-0.91088588   1.95182671]
[-1.86220954  -0.07171595]
[-0.95493      0.62394468]
[-3.25328195  -0.66092292]
[-2.90881505  -0.38353612]
[-3.80045695  -0.38016355]
[-4.47063545  -2.22969086]
[-2.65589151   0.14562659]
[ 0.87444483   3.09050969]
[-0.28584465   2.17004306]
[-3.69602821   0.05595666]
[-2.10297758  -0.13699038]
[-2.3929747   -0.5819506 ]
[-0.93224893   0.50211494]
[-0.38310161   2.41785277]
[-0.71429891   2.33569728]
[-1.22125173   1.44612127]
[-2.60478212  -0.761988  ]
[-3.21436214  -0.58600703]
[-2.56922658  -0.01093208]
[-2.5142908    0.02345174]
[-1.81080307   0.8473443 ]
[-2.36399184  -0.28317222]
[-2.44436643  -0.86193624]
```

```
          [ 1.03880181  2.93560245]]
```

In [6]:
```python
Y = 'labels.npy'
labels = np.load(Y,allow_pickle=True)
# (d) Visualize after projecting to 2-D space
def viz(X):
    plt.ylim(-4,3)
    plt.xlim(-4,4)
    data_reduced = project(X)
    plt.scatter(data_reduced[:,0],data_reduced[:,1],c=labels)
viz(test)
```

```
eigenvector [[-0.39124937  0.13884872]
 [ 0.11687696 -0.4391715 ]
 [-0.40655289  0.29080021]
 [-0.39944906  0.26454833]
 [-0.3778555  -0.35426671]
 [-0.09816172 -0.64299795]
 [-0.45509399 -0.03231459]
 [-0.38587285 -0.30545597]]
```
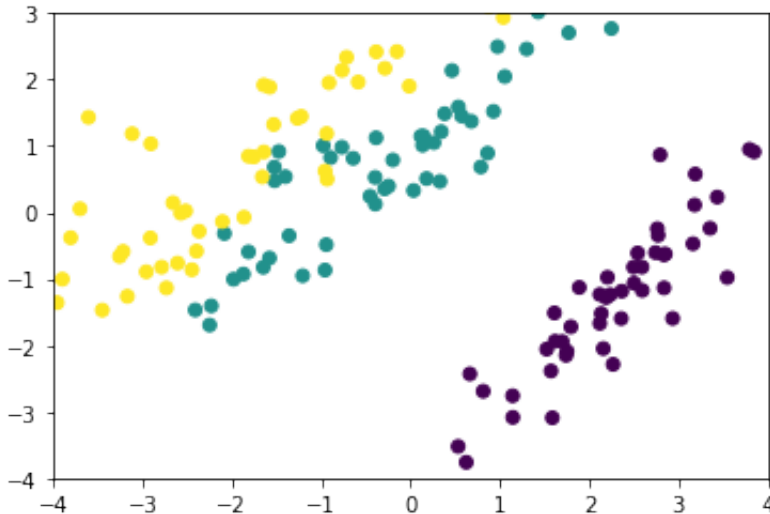

In [7]:
```python
# def main():
#     eval()
#     viz()

# if __name__ == "__main__":
#     main()
```

(e1): If the number of features is 1000 and the number of data points is 10, what will be the dimension of your covariance matrix? Can you suggest what can be changed to improve the performance?1000 by 1000. Number of features is greater than the number of samples and to improve the performance the number of samples must be greater than 1000.(e2): Assume you have a dataset with the original dimensionality as 2 and you have to reduce it to 1. Provide a sample scatter plot of the original data (less than 10 datapoints) where PCA might produce misleading results. You can plot it by hand and then take a picture. In the next cell, switch to Markdown mode and use the command:

In [8]:
```python
x_dat = np.array([-1,1,0,0,0.75,-0.75, 0.75,-0.75])
y_dat = np.array([0,0,1,-1,0.5,0.5,-0.5,-0.5])

plt.scatter(x_dat,y_dat)
```

Out[8]: <matplotlib.collections.PathCollection at 0x7fb8902d4940>
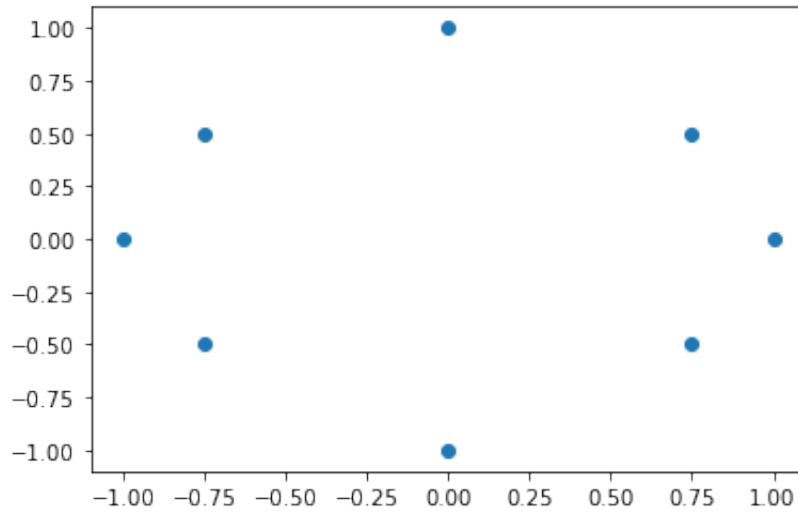
PCA does not work well for non-linear data

This problem was adapted from Professor Farimani's paper. If you are interested in learning more, you can read it here.

In [1]:
```python
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.cluster import KMeans
from sklearn.ensemble import RandomForestClassifier
from sklearn.datasets import make_classification

# (a)
# data preprocessing
data = pd.read_csv('data.csv')
# print(data)
x = np.zeros((2000,2))
labels = data.columns.values
labels = labels[1::2]

for i in range(0,len(labels)):
    x[(i*100):(100*(i+1)),:] = data.values[:,(i*2):2*(i+1)]
#     print(x[(i*100):(100*(i+1)),:])

# print(x)

y = np.zeros(100)
for i in range(1,len(labels)):
    temp = np.ones(100)*i
    y = np.concatenate((y,temp))
# print(y)

y_g = np.column_stack((x,y))

# print(y_g)
np.savetxt('data_processed.csv',y_g, delimiter=',')
# print(y_g[:,0])
X_train,X_test,Y_train,Y_test = train_test_split(y_g[:,0:2], y_g[:,2], test_s
# print(x.size)
# print(X_train.size)

print(X_train, Y_train)
```

```
[[ 191.79    21.737]
 [  69.042 1439.4  ]
 [  70.623 1465.9  ]
 ...
 [  30.148  476.34 ]
 [ 141.9   1060.   ]
 [ 165.3    150.   ]] [ 7. 19. 19. ... 14.  4.  5.]
```

In [2]:
```python
print(x)
```

```
[[1.4600e+00 2.6000e+03]
 [2.1600e+01 2.5000e+03]
 [1.2600e+01 3.2000e+03]
 ...
 [7.3067e+01 1.4419e+03]
 [7.1311e+01 1.4521e+03]
 [7.0910e+01 1.4468e+03]]
```

In [3]:
```python
# (b)
# k-means
kmeans = KMeans(n_clusters=20).fit(X_train)
prediction = kmeans.predict(y_g[:,0:2])
h = 1


X_min, X_max = X_train[:,0].min() - 1, X_train[:, 0].max() + 1
Y_min, Y_max = X_train[:, 1].min() - 1, X_train[:, 1].max() + 1
xx, yy = np.meshgrid(np.arange(X_min, X_max, h), np.arange(Y_min, Y_max, h))

Z = kmeans.predict(np.c_[xx.ravel(), yy.ravel()])

Z = Z.reshape(xx.shape)
plt.figure(1)
plt.clf()
plt.imshow(Z, interpolation = "nearest",extent=(xx.min(), xx.max(), yy.min(),

plt.plot(X_train[:,0],X_train[:,1],"k.", markersize = 5)
centroids = kmeans.cluster_centers_

plt.scatter(centroids[:, 0],
    centroids[:, 1],
    marker="x",
    s=169,
    linewidths=2.5,
    color="r",
    zorder=10,
)
plt.xlim(X_min, X_max)
plt.ylim(Y_min, Y_max)
plt.show()

print(y_g[:,2])
plt.scatter(y_g[:,0:1],y_g[:,1:2],c=prediction)
plt.show()
print(X_train, Y_train)
```

```
[  0.   0.   0.  ...  19.  19.  19.]
```



```
[[ 191.79      21.737]
 [  69.042  1439.4  ]
 [  70.623  1465.9  ]
 ...
 [  30.148   476.34 ]
 [ 141.9    1060.   ]
 [ 165.3     150.   ]]  [ 7.  19.  19.  ...  14.   4.   5.]
```

In [4]:
```python
print(Z)
```

```
[[14 14 14 ...   6   6   6]
 [14 14 14 ...   6   6   6]
 [14 14 14 ...   6   6   6]
 ...
 [19 19 19 ...  19  19  19]
 [19 19 19 ...  19  19  19]
 [19 19 19 ...  19  19  19]]
```

In [5]:

```python
print('Xtrain',X_train)
print('Ytrain',Y_train)
print('Yg',y_g[:,0])
# (c)
#random forest
clf = RandomForestClassifier()
clf.fit(X_train,Y_train)

Xmin, Xmax = X_train[:,0].min() - 1, X_train[:,0].max() + 1
Ymin, Ymax = X_train[:, 1].min() - 1, X_train[:,1].max() + 1

x_x, y_y = np.meshgrid(np.arange(Xmin, Xmax), np.arange(Ymin, Ymax))


print('xx',x_x)
print('yy',y_y)

Z = clf.predict(np.c_[x_x.ravel(), y_y.ravel()])
Z = Z.reshape(x_x.shape)
print('z',Z)
```
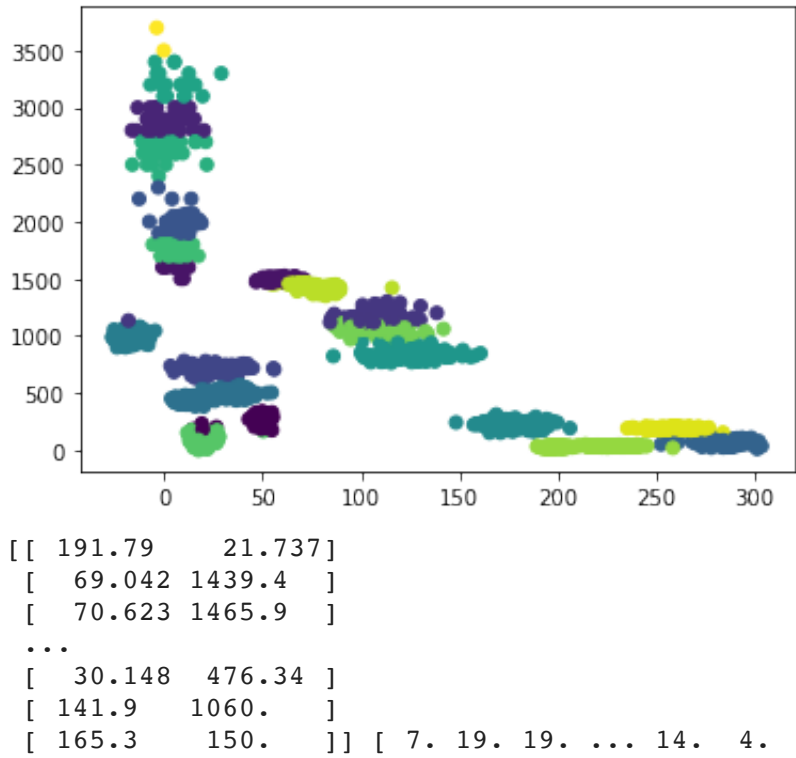
```
Xtrain [[ 191.79      21.737]
 [  69.042 1439.4   ]
 [  70.623 1465.9   ]
 ...
 [  30.148  476.34  ]
 [ 141.9   1060.    ]
 [ 165.3    150.    ]]
Ytrain [ 7. 19. 19. ... 14.  4.  5.]
Yg [ 1.46  21.6    12.6    ... 73.067 71.311 70.91 ]
xx [[-27.453 -26.453 -25.453 ... 302.547 303.547 304.547]
 [-27.453 -26.453 -25.453 ... 302.547 303.547 304.547]
 [-27.453 -26.453 -25.453 ... 302.547 303.547 304.547]
 ...
 [-27.453 -26.453 -25.453 ... 302.547 303.547 304.547]
 [-27.453 -26.453 -25.453 ... 302.547 303.547 304.547]
 [-27.453 -26.453 -25.453 ... 302.547 303.547 304.547]]
yy [[-3.7000e+00 -3.7000e+00 -3.7000e+00 ... -3.7000e+00 -3.7000e+00
  -3.7000e+00]
 [-2.7000e+00 -2.7000e+00 -2.7000e+00 ... -2.7000e+00 -2.7000e+00
  -2.7000e+00]
 [-1.7000e+00 -1.7000e+00 -1.7000e+00 ... -1.7000e+00 -1.7000e+00
  -1.7000e+00]
 ...
 [ 3.6983e+03  3.6983e+03  3.6983e+03 ...  3.6983e+03  3.6983e+03
   3.6983e+03]
 [ 3.6993e+03  3.6993e+03  3.6993e+03 ...  3.6993e+03  3.6993e+03
   3.6993e+03]
 [ 3.7003e+03  3.7003e+03  3.7003e+03 ...  3.7003e+03  3.7003e+03
   3.7003e+03]]
z [[3. 3. 3. ... 1. 1. 1.]
 [3. 3. 3. ... 1. 1. 1.]
 [3. 3. 3. ... 1. 1. 1.]
 ...
 [0. 0. 0. ... 0. 0. 0.]
 [0. 0. 0. ... 0. 0. 0.]
 [0. 0. 0. ... 0. 0. 0.]]
```

In [6]:
```python
print('xx',x_x.shape)
print('yy',y_y.shape)
print('X_train',X_train.shape)

print('Z',Z.shape)
plt.figure(0)
plt.clf()
plt.show()
plt.imshow(Z,extent=(x_x.min(), x_x.max(), y_y.min(), y_y.max()),cmap=plt.cm.

plt.scatter(y_g[:,0:1],y_g[:,1:2],c='black')
```

```
xx (3705, 333)
yy (3705, 333)
X_train (1400, 2)
Z (3705, 333)
<Figure size 432x288 with 0 Axes>
```

Out[6]:   `<matplotlib.collections.PathCollection at 0x7f8f78300df0>`
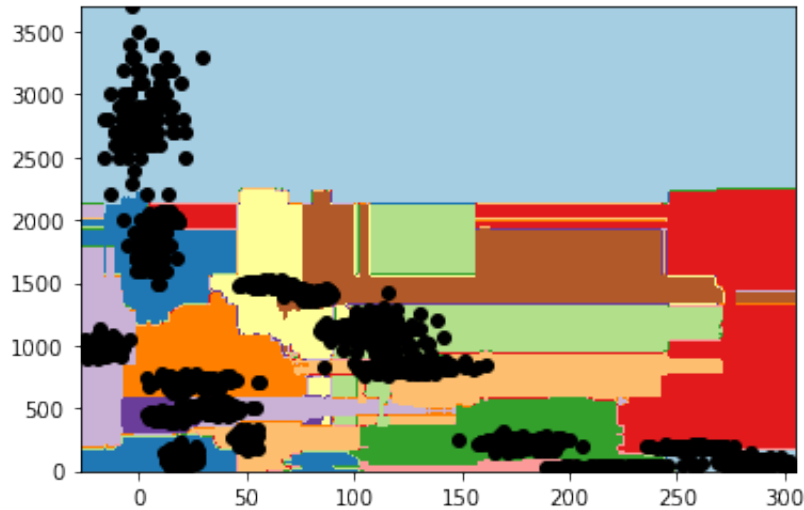
(d)

Analysis

In this question, unsupervised learning (K-means) is being compared with supervised learning(Random-Forest Method). Comparing the kmeans plot with the Random forest plot, it can be seen that the kmeans boundary plot is slightly overfitting the data. As a result, it can be inferred that kmeans is best when labels are unknown whereas random forest is better when the labels are known.

q3

November 6, 2021

```
[1]: !pip install --upgrade tensorflow
```

```
Requirement already satisfied: tensorflow in /usr/local/lib/python3.7/dist-
packages (2.6.0)
Collecting tensorflow
  Downloading tensorflow-2.7.0-cp37-cp37m-manylinux2010_x86_64.whl (489.6 MB)
     |                     | 489.6 MB 10 kB/s
Requirement already satisfied: wrapt>=1.11.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.12.1)
Requirement already satisfied: astunparse>=1.6.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.6.3)
Requirement already satisfied: termcolor>=1.1.0 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (1.1.0)
Collecting libclang>=9.0.1
  Downloading libclang-12.0.0-py2.py3-none-manylinux1_x86_64.whl (13.4 MB)
     |                     | 13.4 MB 209 kB/s
Requirement already satisfied: typing-extensions>=3.6.6 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (3.7.4.3)
Requirement already satisfied: absl-py>=0.4.0 in /usr/local/lib/python3.7/dist-
packages (from tensorflow) (0.12.0)
Requirement already satisfied: opt-einsum>=2.3.2 in
/usr/local/lib/python3.7/dist-packages (from tensorflow) (3.3.0)
Requirement already satisfied: six>=1.12.0 in /usr/local/lib/python3.7/dist-
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Collecting tensorflow-estimator<2.8,~=2.7.0rc0
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64.manylinux2010_x86_64.whl (2.1 MB)
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Installing collected packages: tensorflow-io-gcs-filesystem, tensorflow-
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Successfully installed keras-2.7.0 libclang-12.0.0 tensorflow-2.7.0 tensorflow-
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```python
# from __future__ import print_function
# import keras ##For older versions of keras and tensorflow
from tensorflow import keras
```

```python
import pandas as pd
import numpy as np
from keras.datasets import mnist
from keras.models import Sequential
from keras.layers import Dense, Dropout, Flatten
from keras.layers import InputLayer, Conv2D, MaxPooling2D
from keras import backend as K
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
```

```python
[3]: from google.colab import drive
     drive.mount('/content/drive')
     d_pd = pd.read_csv('/content/drive/MyDrive/data_processed.csv')
```

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

```python
[4]: d_np = d_pd.to_numpy()
     # print(d_np)
```

```python
[5]: data_x,labels = d_np[:,0:2],d_np[:,2]
```

```python
[6]: num_classes = 20
     Xtrain, Xtest, Ytrain, Ytest = train_test_split(data_x,labels,test_size = 0.20)
     Ytrain = keras.utils.to_categorical(Ytrain, num_classes)
     Ytest = keras.utils.to_categorical(Ytest, num_classes)

     scaler = StandardScaler()
     scaler.fit(Xtrain)
     scaler.transform(Xtrain)
     scaler.transform(Xtest)
```

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       [-0.95956815,  1.47873902]])
```

```python
[7]:  # Sequential model is a linear stack of layers
      model = Sequential()
      # Our input is a 28 by 28 image/matrix, in implementation (28x28x1)

      model.add(Dense(128,input_dim=2, activation='relu'))
      model.add(Dense(64,activation='relu'))
      model.add(Dense(32,activation='relu'))
      model.add(Dense(num_classes, activation='softmax'))

      model.compile(loss=keras.losses.categorical_crossentropy,
                    optimizer=keras.optimizers.Adam(),
                    metrics=['accuracy'])
```

```python
[8]:  batch_size = 128

      # exact number of times that your model will see each training image
      epochs = 5000

      # train network by calling fit function
      model.fit(Xtrain, Ytrain,
                batch_size=batch_size,
                epochs=epochs,
                verbose=1,
                validation_data=(Xtest, Ytest))

      # evaluate the accuracy of trained model using the testing data
      score = model.evaluate(Xtest, Ytest, verbose=1)
      print('Test loss:', score[0])
      print('Test accuracy:', score[1])
```

Streaming output truncated to the last 5000 lines.
13/13 [==============================] - 0s 9ms/step - loss: 0.1249 - accuracy:
0.9525 - val_loss: 0.1619 - val_accuracy: 0.9100
Epoch 2503/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1344 - accuracy:
0.9481 - val_loss: 0.1005 - val_accuracy: 0.9875

13

```
Epoch 2504/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1381 - accuracy:
0.9450 - val_loss: 0.1045 - val_accuracy: 0.9750
Epoch 2505/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1277 - accuracy:
0.9550 - val_loss: 0.1131 - val_accuracy: 0.9625
Epoch 2506/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1211 - accuracy:
0.9543 - val_loss: 0.1453 - val_accuracy: 0.9825
Epoch 2507/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1347 - accuracy:
0.9437 - val_loss: 0.1020 - val_accuracy: 0.9800
Epoch 2508/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1213 - accuracy:
0.9562 - val_loss: 0.1054 - val_accuracy: 0.9825
Epoch 2509/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1264 - accuracy:
0.9518 - val_loss: 0.1267 - val_accuracy: 0.9550
Epoch 2510/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1303 - accuracy:
0.9512 - val_loss: 0.1091 - val_accuracy: 0.9850
Epoch 2511/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1345 - accuracy:
0.9493 - val_loss: 0.0968 - val_accuracy: 0.9825
Epoch 2512/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1500 - accuracy:
0.9337 - val_loss: 0.1181 - val_accuracy: 0.9825
Epoch 2513/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1301 - accuracy:
0.9500 - val_loss: 0.1121 - val_accuracy: 0.9875
Epoch 2514/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1328 - accuracy:
0.9481 - val_loss: 0.1859 - val_accuracy: 0.9275
Epoch 2515/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1584 - accuracy:
0.9318 - val_loss: 0.1708 - val_accuracy: 0.9350
Epoch 2516/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1257 - accuracy:
0.9493 - val_loss: 0.1007 - val_accuracy: 0.9800
Epoch 2517/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1311 - accuracy:
0.9512 - val_loss: 0.1508 - val_accuracy: 0.9425
Epoch 2518/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1260 - accuracy:
0.9456 - val_loss: 0.1303 - val_accuracy: 0.9700
Epoch 2519/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1281 - accuracy:
0.9537 - val_loss: 0.1520 - val_accuracy: 0.9375
```

```
Epoch 2520/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1457 - accuracy:
0.9468 - val_loss: 0.1007 - val_accuracy: 0.9850
Epoch 2521/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1272 - accuracy:
0.9487 - val_loss: 0.1083 - val_accuracy: 0.9625
Epoch 2522/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1354 - accuracy:
0.9412 - val_loss: 0.1124 - val_accuracy: 0.9550
Epoch 2523/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1381 - accuracy:
0.9500 - val_loss: 0.1189 - val_accuracy: 0.9575
Epoch 2524/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1220 - accuracy:
0.9543 - val_loss: 0.0951 - val_accuracy: 0.9675
Epoch 2525/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1202 - accuracy:
0.9568 - val_loss: 0.0928 - val_accuracy: 0.9750
Epoch 2526/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1170 - accuracy:
0.9575 - val_loss: 0.1211 - val_accuracy: 0.9775
Epoch 2527/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1455 - accuracy:
0.9468 - val_loss: 0.1402 - val_accuracy: 0.9275
Epoch 2528/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1302 - accuracy:
0.9456 - val_loss: 0.1077 - val_accuracy: 0.9525
Epoch 2529/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1190 - accuracy:
0.9581 - val_loss: 0.0977 - val_accuracy: 0.9850
Epoch 2530/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1186 - accuracy:
0.9562 - val_loss: 0.0947 - val_accuracy: 0.9725
Epoch 2531/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1187 - accuracy:
0.9575 - val_loss: 0.1314 - val_accuracy: 0.9475
Epoch 2532/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1293 - accuracy:
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Epoch 2533/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1239 - accuracy:
0.9562 - val_loss: 0.1221 - val_accuracy: 0.9650
Epoch 2534/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1249 - accuracy:
0.9518 - val_loss: 0.1412 - val_accuracy: 0.9575
Epoch 2535/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1572 - accuracy:
0.9356 - val_loss: 0.1593 - val_accuracy: 0.9725
```

```
Epoch 2536/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1475 - accuracy:
0.9412 - val_loss: 0.1306 - val_accuracy: 0.9450
Epoch 2537/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.2001 - accuracy:
0.9293 - val_loss: 0.1462 - val_accuracy: 0.9275
Epoch 2538/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2678 - accuracy:
0.8931 - val_loss: 0.1286 - val_accuracy: 0.9550
Epoch 2539/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1852 - accuracy:
0.9231 - val_loss: 0.1485 - val_accuracy: 0.9550
Epoch 2540/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1554 - accuracy:
0.9356 - val_loss: 0.1209 - val_accuracy: 0.9725
Epoch 2541/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1370 - accuracy:
0.9518 - val_loss: 0.1016 - val_accuracy: 0.9700
Epoch 2542/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1372 - accuracy:
0.9450 - val_loss: 0.1422 - val_accuracy: 0.9250
Epoch 2543/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1273 - accuracy:
0.9506 - val_loss: 0.1228 - val_accuracy: 0.9600
Epoch 2544/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1267 - accuracy:
0.9531 - val_loss: 0.0863 - val_accuracy: 0.9825
Epoch 2545/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1125 - accuracy:
0.9575 - val_loss: 0.0981 - val_accuracy: 0.9875
Epoch 2546/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1369 - accuracy:
0.9437 - val_loss: 0.2825 - val_accuracy: 0.8925
Epoch 2547/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2076 - accuracy:
0.9056 - val_loss: 0.1447 - val_accuracy: 0.9425
Epoch 2548/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1338 - accuracy:
0.9493 - val_loss: 0.1393 - val_accuracy: 0.9800
Epoch 2549/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1366 - accuracy:
0.9506 - val_loss: 0.1145 - val_accuracy: 0.9700
Epoch 2550/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1257 - accuracy:
0.9537 - val_loss: 0.1448 - val_accuracy: 0.9775
Epoch 2551/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1309 - accuracy:
0.9556 - val_loss: 0.1314 - val_accuracy: 0.9650
```

```
Epoch 2552/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1329 - accuracy:
0.9518 - val_loss: 0.1195 - val_accuracy: 0.9625
Epoch 2553/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1626 - accuracy:
0.9331 - val_loss: 0.0914 - val_accuracy: 0.9750
Epoch 2554/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1378 - accuracy:
0.9462 - val_loss: 0.1186 - val_accuracy: 0.9550
Epoch 2555/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1297 - accuracy:
0.9506 - val_loss: 0.0997 - val_accuracy: 0.9800
Epoch 2556/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1240 - accuracy:
0.9506 - val_loss: 0.1173 - val_accuracy: 0.9725
Epoch 2557/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1243 - accuracy:
0.9512 - val_loss: 0.1056 - val_accuracy: 0.9800
Epoch 2558/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1213 - accuracy:
0.9543 - val_loss: 0.1188 - val_accuracy: 0.9625
Epoch 2559/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1325 - accuracy:
0.9481 - val_loss: 0.1191 - val_accuracy: 0.9625
Epoch 2560/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1247 - accuracy:
0.9543 - val_loss: 0.0971 - val_accuracy: 0.9650
Epoch 2561/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1296 - accuracy:
0.9525 - val_loss: 0.1034 - val_accuracy: 0.9750
Epoch 2562/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1209 - accuracy:
0.9531 - val_loss: 0.1038 - val_accuracy: 0.9725
Epoch 2563/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1205 - accuracy:
0.9575 - val_loss: 0.1174 - val_accuracy: 0.9825
Epoch 2564/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1295 - accuracy:
0.9468 - val_loss: 0.1799 - val_accuracy: 0.9225
Epoch 2565/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1530 - accuracy:
0.9393 - val_loss: 0.0978 - val_accuracy: 0.9650
Epoch 2566/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1264 - accuracy:
0.9543 - val_loss: 0.0939 - val_accuracy: 0.9825
Epoch 2567/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1256 - accuracy:
0.9543 - val_loss: 0.1018 - val_accuracy: 0.9825
```

```
Epoch 2568/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1318 - accuracy:
0.9468 - val_loss: 0.1195 - val_accuracy: 0.9550
Epoch 2569/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1413 - accuracy:
0.9475 - val_loss: 0.0884 - val_accuracy: 0.9650
Epoch 2570/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1256 - accuracy:
0.9518 - val_loss: 0.0917 - val_accuracy: 0.9675
Epoch 2571/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1222 - accuracy:
0.9575 - val_loss: 0.1120 - val_accuracy: 0.9650
Epoch 2572/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1424 - accuracy:
0.9418 - val_loss: 0.2076 - val_accuracy: 0.9100
Epoch 2573/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1944 - accuracy:
0.9206 - val_loss: 0.1343 - val_accuracy: 0.9500
Epoch 2574/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1536 - accuracy:
0.9387 - val_loss: 0.1267 - val_accuracy: 0.9725
Epoch 2575/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1464 - accuracy:
0.9412 - val_loss: 0.1369 - val_accuracy: 0.9675
Epoch 2576/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1553 - accuracy:
0.9393 - val_loss: 0.0954 - val_accuracy: 0.9750
Epoch 2577/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1605 - accuracy:
0.9281 - val_loss: 0.0947 - val_accuracy: 0.9625
Epoch 2578/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1697 - accuracy:
0.9250 - val_loss: 0.1047 - val_accuracy: 0.9625
Epoch 2579/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1414 - accuracy:
0.9425 - val_loss: 0.1141 - val_accuracy: 0.9625
Epoch 2580/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1970 - accuracy:
0.9137 - val_loss: 0.1091 - val_accuracy: 0.9675
Epoch 2581/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1721 - accuracy:
0.9250 - val_loss: 0.1989 - val_accuracy: 0.8950
Epoch 2582/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1545 - accuracy:
0.9362 - val_loss: 0.2079 - val_accuracy: 0.8975
Epoch 2583/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1565 - accuracy:
0.9306 - val_loss: 0.1311 - val_accuracy: 0.9700
```

```
Epoch 2584/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1409 - accuracy:
0.9462 - val_loss: 0.0997 - val_accuracy: 0.9775
Epoch 2585/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1214 - accuracy:
0.9568 - val_loss: 0.1081 - val_accuracy: 0.9700
Epoch 2586/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1281 - accuracy:
0.9500 - val_loss: 0.1470 - val_accuracy: 0.9350
Epoch 2587/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1282 - accuracy:
0.9481 - val_loss: 0.1033 - val_accuracy: 0.9850
Epoch 2588/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1314 - accuracy:
0.9468 - val_loss: 0.1320 - val_accuracy: 0.9550
Epoch 2589/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1605 - accuracy:
0.9318 - val_loss: 0.1048 - val_accuracy: 0.9650
Epoch 2590/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1952 - accuracy:
0.9225 - val_loss: 0.1823 - val_accuracy: 0.9400
Epoch 2591/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1556 - accuracy:
0.9425 - val_loss: 0.1326 - val_accuracy: 0.9450
Epoch 2592/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1407 - accuracy:
0.9481 - val_loss: 0.1184 - val_accuracy: 0.9675
Epoch 2593/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1356 - accuracy:
0.9475 - val_loss: 0.1109 - val_accuracy: 0.9625
Epoch 2594/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1304 - accuracy:
0.9537 - val_loss: 0.1004 - val_accuracy: 0.9725
Epoch 2595/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1254 - accuracy:
0.9581 - val_loss: 0.1182 - val_accuracy: 0.9725
Epoch 2596/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1240 - accuracy:
0.9518 - val_loss: 0.1026 - val_accuracy: 0.9750
Epoch 2597/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1267 - accuracy:
0.9531 - val_loss: 0.0932 - val_accuracy: 0.9750
Epoch 2598/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1257 - accuracy:
0.9468 - val_loss: 0.1079 - val_accuracy: 0.9775
Epoch 2599/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1203 - accuracy:
0.9556 - val_loss: 0.1372 - val_accuracy: 0.9825
```

```
Epoch 2600/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1310 - accuracy:
0.9543 - val_loss: 0.1346 - val_accuracy: 0.9450
Epoch 2601/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1451 - accuracy:
0.9412 - val_loss: 0.1645 - val_accuracy: 0.9075
Epoch 2602/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1493 - accuracy:
0.9362 - val_loss: 0.0950 - val_accuracy: 0.9600
Epoch 2603/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1258 - accuracy:
0.9512 - val_loss: 0.1075 - val_accuracy: 0.9675
Epoch 2604/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1310 - accuracy:
0.9556 - val_loss: 0.1324 - val_accuracy: 0.9575
Epoch 2605/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1314 - accuracy:
0.9506 - val_loss: 0.0946 - val_accuracy: 0.9850
Epoch 2606/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1251 - accuracy:
0.9537 - val_loss: 0.0969 - val_accuracy: 0.9825
Epoch 2607/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1323 - accuracy:
0.9500 - val_loss: 0.1113 - val_accuracy: 0.9700
Epoch 2608/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1450 - accuracy:
0.9450 - val_loss: 0.2618 - val_accuracy: 0.8925
Epoch 2609/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1512 - accuracy:
0.9406 - val_loss: 0.0956 - val_accuracy: 0.9625
Epoch 2610/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1258 - accuracy:
0.9475 - val_loss: 0.1131 - val_accuracy: 0.9575
Epoch 2611/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1268 - accuracy:
0.9600 - val_loss: 0.0965 - val_accuracy: 0.9825
Epoch 2612/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1346 - accuracy:
0.9500 - val_loss: 0.1139 - val_accuracy: 0.9700
Epoch 2613/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1275 - accuracy:
0.9581 - val_loss: 0.1073 - val_accuracy: 0.9775
Epoch 2614/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1251 - accuracy:
0.9512 - val_loss: 0.1000 - val_accuracy: 0.9775
Epoch 2615/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1244 - accuracy:
0.9531 - val_loss: 0.1054 - val_accuracy: 0.9650
```

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Epoch 2616/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1277 - accuracy:
0.9450 - val_loss: 0.1305 - val_accuracy: 0.9300
Epoch 2617/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1287 - accuracy:
0.9506 - val_loss: 0.0961 - val_accuracy: 0.9775
Epoch 2618/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1208 - accuracy:
0.9568 - val_loss: 0.0938 - val_accuracy: 0.9750
Epoch 2619/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1234 - accuracy:
0.9550 - val_loss: 0.1079 - val_accuracy: 0.9625
Epoch 2620/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1375 - accuracy:
0.9481 - val_loss: 0.1692 - val_accuracy: 0.9150
Epoch 2621/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1647 - accuracy:
0.9293 - val_loss: 0.1034 - val_accuracy: 0.9725
Epoch 2622/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1563 - accuracy:
0.9362 - val_loss: 0.2419 - val_accuracy: 0.9025
Epoch 2623/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1597 - accuracy:
0.9337 - val_loss: 0.1365 - val_accuracy: 0.9600
Epoch 2624/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1308 - accuracy:
0.9512 - val_loss: 0.1041 - val_accuracy: 0.9800
Epoch 2625/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1205 - accuracy:
0.9543 - val_loss: 0.1092 - val_accuracy: 0.9800
Epoch 2626/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1237 - accuracy:
0.9562 - val_loss: 0.0970 - val_accuracy: 0.9675
Epoch 2627/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1187 - accuracy:
0.9600 - val_loss: 0.1024 - val_accuracy: 0.9750
Epoch 2628/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1290 - accuracy:
0.9537 - val_loss: 0.1074 - val_accuracy: 0.9600
Epoch 2629/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1252 - accuracy:
0.9512 - val_loss: 0.1025 - val_accuracy: 0.9875
Epoch 2630/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1210 - accuracy:
0.9568 - val_loss: 0.1086 - val_accuracy: 0.9800
Epoch 2631/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1266 - accuracy:
0.9543 - val_loss: 0.1399 - val_accuracy: 0.9500
```

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Epoch 2632/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1440 - accuracy:
0.9475 - val_loss: 0.1540 - val_accuracy: 0.9250
Epoch 2633/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1427 - accuracy:
0.9387 - val_loss: 0.1165 - val_accuracy: 0.9575
Epoch 2634/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1187 - accuracy:
0.9600 - val_loss: 0.0882 - val_accuracy: 0.9750
Epoch 2635/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1211 - accuracy:
0.9556 - val_loss: 0.1238 - val_accuracy: 0.9850
Epoch 2636/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1458 - accuracy:
0.9368 - val_loss: 0.2440 - val_accuracy: 0.9150
Epoch 2637/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2250 - accuracy:
0.9037 - val_loss: 0.1284 - val_accuracy: 0.9725
Epoch 2638/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1575 - accuracy:
0.9393 - val_loss: 0.1354 - val_accuracy: 0.9625
Epoch 2639/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1341 - accuracy:
0.9487 - val_loss: 0.1191 - val_accuracy: 0.9775
Epoch 2640/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1285 - accuracy:
0.9531 - val_loss: 0.1074 - val_accuracy: 0.9700
Epoch 2641/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1208 - accuracy:
0.9550 - val_loss: 0.0989 - val_accuracy: 0.9700
Epoch 2642/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1313 - accuracy:
0.9500 - val_loss: 0.0953 - val_accuracy: 0.9750
Epoch 2643/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1319 - accuracy:
0.9462 - val_loss: 0.1329 - val_accuracy: 0.9675
Epoch 2644/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1257 - accuracy:
0.9506 - val_loss: 0.1325 - val_accuracy: 0.9500
Epoch 2645/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1321 - accuracy:
0.9487 - val_loss: 0.1240 - val_accuracy: 0.9800
Epoch 2646/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1271 - accuracy:
0.9543 - val_loss: 0.1280 - val_accuracy: 0.9700
Epoch 2647/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1397 - accuracy:
0.9493 - val_loss: 0.0901 - val_accuracy: 0.9700
```

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Epoch 2648/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1524 - accuracy:
0.9350 - val_loss: 0.1089 - val_accuracy: 0.9700
Epoch 2649/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1597 - accuracy:
0.9381 - val_loss: 0.1245 - val_accuracy: 0.9250
Epoch 2650/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.2327 - accuracy:
0.8981 - val_loss: 0.1210 - val_accuracy: 0.9650
Epoch 2651/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2082 - accuracy:
0.9093 - val_loss: 0.1424 - val_accuracy: 0.9550
Epoch 2652/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1756 - accuracy:
0.9243 - val_loss: 0.1985 - val_accuracy: 0.8800
Epoch 2653/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1992 - accuracy:
0.9137 - val_loss: 0.1144 - val_accuracy: 0.9550
Epoch 2654/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1453 - accuracy:
0.9437 - val_loss: 0.1059 - val_accuracy: 0.9775
Epoch 2655/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1283 - accuracy:
0.9525 - val_loss: 0.0967 - val_accuracy: 0.9725
Epoch 2656/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1340 - accuracy:
0.9562 - val_loss: 0.1118 - val_accuracy: 0.9625
Epoch 2657/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1331 - accuracy:
0.9512 - val_loss: 0.1183 - val_accuracy: 0.9500
Epoch 2658/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1608 - accuracy:
0.9262 - val_loss: 0.1597 - val_accuracy: 0.9375
Epoch 2659/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1519 - accuracy:
0.9381 - val_loss: 0.1196 - val_accuracy: 0.9675
Epoch 2660/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1321 - accuracy:
0.9518 - val_loss: 0.1191 - val_accuracy: 0.9625
Epoch 2661/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1371 - accuracy:
0.9468 - val_loss: 0.1326 - val_accuracy: 0.9575
Epoch 2662/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1446 - accuracy:
0.9481 - val_loss: 0.1746 - val_accuracy: 0.9325
Epoch 2663/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1336 - accuracy:
0.9462 - val_loss: 0.1456 - val_accuracy: 0.9250
```

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Epoch 2664/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1455 - accuracy:
0.9456 - val_loss: 0.1352 - val_accuracy: 0.9525
Epoch 2665/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1257 - accuracy:
0.9581 - val_loss: 0.1246 - val_accuracy: 0.9800
Epoch 2666/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1192 - accuracy:
0.9593 - val_loss: 0.1079 - val_accuracy: 0.9825
Epoch 2667/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1186 - accuracy:
0.9606 - val_loss: 0.1175 - val_accuracy: 0.9725
Epoch 2668/5000
13/13 [==============================] - 0s 8ms/step - loss: 0.1306 - accuracy:
0.9443 - val_loss: 0.1064 - val_accuracy: 0.9775
Epoch 2669/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1284 - accuracy:
0.9531 - val_loss: 0.1435 - val_accuracy: 0.9350
Epoch 2670/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1351 - accuracy:
0.9406 - val_loss: 0.1134 - val_accuracy: 0.9650
Epoch 2671/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1344 - accuracy:
0.9487 - val_loss: 0.1143 - val_accuracy: 0.9650
Epoch 2672/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1252 - accuracy:
0.9550 - val_loss: 0.1162 - val_accuracy: 0.9775
Epoch 2673/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1278 - accuracy:
0.9506 - val_loss: 0.1072 - val_accuracy: 0.9725
Epoch 2674/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1277 - accuracy:
0.9562 - val_loss: 0.1005 - val_accuracy: 0.9850
Epoch 2675/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1242 - accuracy:
0.9543 - val_loss: 0.0964 - val_accuracy: 0.9800
Epoch 2676/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1251 - accuracy:
0.9525 - val_loss: 0.0942 - val_accuracy: 0.9700
Epoch 2677/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1225 - accuracy:
0.9550 - val_loss: 0.0950 - val_accuracy: 0.9700
Epoch 2678/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1221 - accuracy:
0.9543 - val_loss: 0.0939 - val_accuracy: 0.9800
Epoch 2679/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1268 - accuracy:
0.9425 - val_loss: 0.1002 - val_accuracy: 0.9600
```

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Epoch 2680/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1412 - accuracy:
0.9431 - val_loss: 0.0959 - val_accuracy: 0.9675
Epoch 2681/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1550 - accuracy:
0.9306 - val_loss: 0.1238 - val_accuracy: 0.9550
Epoch 2682/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1445 - accuracy:
0.9393 - val_loss: 0.1206 - val_accuracy: 0.9675
Epoch 2683/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1251 - accuracy:
0.9581 - val_loss: 0.1106 - val_accuracy: 0.9650
Epoch 2684/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1194 - accuracy:
0.9575 - val_loss: 0.0890 - val_accuracy: 0.9725
Epoch 2685/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1181 - accuracy:
0.9562 - val_loss: 0.1171 - val_accuracy: 0.9650
Epoch 2686/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1202 - accuracy:
0.9568 - val_loss: 0.0938 - val_accuracy: 0.9750
Epoch 2687/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1263 - accuracy:
0.9493 - val_loss: 0.0981 - val_accuracy: 0.9775
Epoch 2688/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1277 - accuracy:
0.9537 - val_loss: 0.1006 - val_accuracy: 0.9575
Epoch 2689/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1220 - accuracy:
0.9543 - val_loss: 0.0968 - val_accuracy: 0.9850
Epoch 2690/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1174 - accuracy:
0.9625 - val_loss: 0.1188 - val_accuracy: 0.9850
Epoch 2691/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1217 - accuracy:
0.9575 - val_loss: 0.1082 - val_accuracy: 0.9750
Epoch 2692/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1136 - accuracy:
0.9593 - val_loss: 0.1558 - val_accuracy: 0.9150
Epoch 2693/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1455 - accuracy:
0.9406 - val_loss: 0.1347 - val_accuracy: 0.9525
Epoch 2694/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1566 - accuracy:
0.9425 - val_loss: 0.1063 - val_accuracy: 0.9600
Epoch 2695/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1474 - accuracy:
0.9393 - val_loss: 0.1006 - val_accuracy: 0.9650
```

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Epoch 2696/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1283 - accuracy:
0.9543 - val_loss: 0.1471 - val_accuracy: 0.9750
Epoch 2697/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1206 - accuracy:
0.9587 - val_loss: 0.1267 - val_accuracy: 0.9525
Epoch 2698/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1219 - accuracy:
0.9537 - val_loss: 0.1458 - val_accuracy: 0.9475
Epoch 2699/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1342 - accuracy:
0.9500 - val_loss: 0.1139 - val_accuracy: 0.9525
Epoch 2700/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1239 - accuracy:
0.9487 - val_loss: 0.1323 - val_accuracy: 0.9425
Epoch 2701/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1300 - accuracy:
0.9537 - val_loss: 0.1326 - val_accuracy: 0.9425
Epoch 2702/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1264 - accuracy:
0.9506 - val_loss: 0.1552 - val_accuracy: 0.9225
Epoch 2703/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1352 - accuracy:
0.9418 - val_loss: 0.1110 - val_accuracy: 0.9750
Epoch 2704/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1182 - accuracy:
0.9556 - val_loss: 0.1201 - val_accuracy: 0.9825
Epoch 2705/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1235 - accuracy:
0.9543 - val_loss: 0.1065 - val_accuracy: 0.9750
Epoch 2706/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1323 - accuracy:
0.9493 - val_loss: 0.0903 - val_accuracy: 0.9825
Epoch 2707/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1486 - accuracy:
0.9387 - val_loss: 0.2724 - val_accuracy: 0.8800
Epoch 2708/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1511 - accuracy:
0.9387 - val_loss: 0.1182 - val_accuracy: 0.9650
Epoch 2709/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1263 - accuracy:
0.9518 - val_loss: 0.0959 - val_accuracy: 0.9725
Epoch 2710/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1275 - accuracy:
0.9562 - val_loss: 0.1500 - val_accuracy: 0.9475
Epoch 2711/5000
13/13 [==============================] - 0s 17ms/step - loss: 0.1262 - accuracy:
0.9587 - val_loss: 0.1158 - val_accuracy: 0.9600
```

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Epoch 2712/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1202 - accuracy:
0.9606 - val_loss: 0.0974 - val_accuracy: 0.9800
Epoch 2713/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1178 - accuracy:
0.9593 - val_loss: 0.1239 - val_accuracy: 0.9650
Epoch 2714/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1273 - accuracy:
0.9518 - val_loss: 0.1041 - val_accuracy: 0.9875
Epoch 2715/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1262 - accuracy:
0.9556 - val_loss: 0.1055 - val_accuracy: 0.9850
Epoch 2716/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1257 - accuracy:
0.9537 - val_loss: 0.1271 - val_accuracy: 0.9700
Epoch 2717/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1384 - accuracy:
0.9456 - val_loss: 0.1580 - val_accuracy: 0.9350
Epoch 2718/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1417 - accuracy:
0.9450 - val_loss: 0.1503 - val_accuracy: 0.9750
Epoch 2719/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1672 - accuracy:
0.9337 - val_loss: 0.1164 - val_accuracy: 0.9800
Epoch 2720/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1818 - accuracy:
0.9250 - val_loss: 0.1417 - val_accuracy: 0.9275
Epoch 2721/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1445 - accuracy:
0.9450 - val_loss: 0.1318 - val_accuracy: 0.9675
Epoch 2722/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1287 - accuracy:
0.9506 - val_loss: 0.1207 - val_accuracy: 0.9675
Epoch 2723/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1762 - accuracy:
0.9250 - val_loss: 0.3689 - val_accuracy: 0.8775
Epoch 2724/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.2236 - accuracy:
0.9074 - val_loss: 0.1618 - val_accuracy: 0.9400
Epoch 2725/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1698 - accuracy:
0.9293 - val_loss: 0.1228 - val_accuracy: 0.9700
Epoch 2726/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1427 - accuracy:
0.9468 - val_loss: 0.1164 - val_accuracy: 0.9575
Epoch 2727/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1392 - accuracy:
0.9506 - val_loss: 0.1240 - val_accuracy: 0.9425
```

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Epoch 2728/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1316 - accuracy:
0.9493 - val_loss: 0.1108 - val_accuracy: 0.9625
Epoch 2729/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1337 - accuracy:
0.9531 - val_loss: 0.1109 - val_accuracy: 0.9800
Epoch 2730/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1221 - accuracy:
0.9556 - val_loss: 0.0910 - val_accuracy: 0.9825
Epoch 2731/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1274 - accuracy:
0.9537 - val_loss: 0.1094 - val_accuracy: 0.9625
Epoch 2732/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1241 - accuracy:
0.9587 - val_loss: 0.1059 - val_accuracy: 0.9875
Epoch 2733/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1171 - accuracy:
0.9600 - val_loss: 0.0918 - val_accuracy: 0.9825
Epoch 2734/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1207 - accuracy:
0.9581 - val_loss: 0.1027 - val_accuracy: 0.9875
Epoch 2735/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1227 - accuracy:
0.9518 - val_loss: 0.1018 - val_accuracy: 0.9725
Epoch 2736/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1342 - accuracy:
0.9481 - val_loss: 0.1017 - val_accuracy: 0.9600
Epoch 2737/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1282 - accuracy:
0.9543 - val_loss: 0.0906 - val_accuracy: 0.9825
Epoch 2738/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1167 - accuracy:
0.9600 - val_loss: 0.0855 - val_accuracy: 0.9750
Epoch 2739/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1213 - accuracy:
0.9562 - val_loss: 0.1098 - val_accuracy: 0.9825
Epoch 2740/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1383 - accuracy:
0.9493 - val_loss: 0.1531 - val_accuracy: 0.9225
Epoch 2741/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1399 - accuracy:
0.9487 - val_loss: 0.0992 - val_accuracy: 0.9725
Epoch 2742/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1257 - accuracy:
0.9493 - val_loss: 0.1023 - val_accuracy: 0.9650
Epoch 2743/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1360 - accuracy:
0.9450 - val_loss: 0.1191 - val_accuracy: 0.9650
```

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Epoch 2744/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1227 - accuracy:
0.9512 - val_loss: 0.0898 - val_accuracy: 0.9700
Epoch 2745/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1362 - accuracy:
0.9518 - val_loss: 0.1037 - val_accuracy: 0.9775
Epoch 2746/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1550 - accuracy:
0.9343 - val_loss: 0.1195 - val_accuracy: 0.9550
Epoch 2747/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1365 - accuracy:
0.9500 - val_loss: 0.0896 - val_accuracy: 0.9625
Epoch 2748/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1325 - accuracy:
0.9450 - val_loss: 0.0950 - val_accuracy: 0.9775
Epoch 2749/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1391 - accuracy:
0.9412 - val_loss: 0.1275 - val_accuracy: 0.9550
Epoch 2750/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1258 - accuracy:
0.9550 - val_loss: 0.1022 - val_accuracy: 0.9750
Epoch 2751/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1252 - accuracy:
0.9481 - val_loss: 0.0875 - val_accuracy: 0.9775
Epoch 2752/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1194 - accuracy:
0.9531 - val_loss: 0.0983 - val_accuracy: 0.9850
Epoch 2753/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1260 - accuracy:
0.9581 - val_loss: 0.1250 - val_accuracy: 0.9725
Epoch 2754/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1157 - accuracy:
0.9587 - val_loss: 0.0872 - val_accuracy: 0.9625
Epoch 2755/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1216 - accuracy:
0.9568 - val_loss: 0.0899 - val_accuracy: 0.9800
Epoch 2756/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1127 - accuracy:
0.9593 - val_loss: 0.0863 - val_accuracy: 0.9850
Epoch 2757/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1155 - accuracy:
0.9575 - val_loss: 0.1286 - val_accuracy: 0.9525
Epoch 2758/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1243 - accuracy:
0.9581 - val_loss: 0.1053 - val_accuracy: 0.9825
Epoch 2759/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1625 - accuracy:
0.9356 - val_loss: 0.1343 - val_accuracy: 0.9525
```

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Epoch 2760/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1705 - accuracy:
0.9337 - val_loss: 0.1106 - val_accuracy: 0.9600
Epoch 2761/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1309 - accuracy:
0.9456 - val_loss: 0.0972 - val_accuracy: 0.9700
Epoch 2762/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1218 - accuracy:
0.9587 - val_loss: 0.1039 - val_accuracy: 0.9850
Epoch 2763/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1274 - accuracy:
0.9512 - val_loss: 0.1192 - val_accuracy: 0.9400
Epoch 2764/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1214 - accuracy:
0.9531 - val_loss: 0.0992 - val_accuracy: 0.9775
Epoch 2765/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1129 - accuracy:
0.9612 - val_loss: 0.1234 - val_accuracy: 0.9775
Epoch 2766/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1239 - accuracy:
0.9487 - val_loss: 0.1519 - val_accuracy: 0.9650
Epoch 2767/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1293 - accuracy:
0.9550 - val_loss: 0.0941 - val_accuracy: 0.9800
Epoch 2768/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1184 - accuracy:
0.9550 - val_loss: 0.1270 - val_accuracy: 0.9500
Epoch 2769/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1458 - accuracy:
0.9418 - val_loss: 0.1509 - val_accuracy: 0.9500
Epoch 2770/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1525 - accuracy:
0.9337 - val_loss: 0.0898 - val_accuracy: 0.9750
Epoch 2771/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1533 - accuracy:
0.9268 - val_loss: 0.2482 - val_accuracy: 0.8800
Epoch 2772/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1979 - accuracy:
0.9181 - val_loss: 0.1060 - val_accuracy: 0.9825
Epoch 2773/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1998 - accuracy:
0.9181 - val_loss: 0.2045 - val_accuracy: 0.9275
Epoch 2774/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1443 - accuracy:
0.9468 - val_loss: 0.1359 - val_accuracy: 0.9300
Epoch 2775/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1463 - accuracy:
0.9443 - val_loss: 0.1362 - val_accuracy: 0.9575
```

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Epoch 2776/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1428 - accuracy:
0.9368 - val_loss: 0.0999 - val_accuracy: 0.9725
Epoch 2777/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1296 - accuracy:
0.9537 - val_loss: 0.0935 - val_accuracy: 0.9750
Epoch 2778/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1312 - accuracy:
0.9512 - val_loss: 0.1057 - val_accuracy: 0.9800
Epoch 2779/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1198 - accuracy:
0.9575 - val_loss: 0.1376 - val_accuracy: 0.9800
Epoch 2780/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1239 - accuracy:
0.9568 - val_loss: 0.1498 - val_accuracy: 0.9475
Epoch 2781/5000
13/13 [==============================] - 0s 18ms/step - loss: 0.1276 - accuracy:
0.9456 - val_loss: 0.1098 - val_accuracy: 0.9700
Epoch 2782/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1232 - accuracy:
0.9568 - val_loss: 0.0960 - val_accuracy: 0.9675
Epoch 2783/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1200 - accuracy:
0.9568 - val_loss: 0.1106 - val_accuracy: 0.9750
Epoch 2784/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1236 - accuracy:
0.9581 - val_loss: 0.1061 - val_accuracy: 0.9725
Epoch 2785/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1521 - accuracy:
0.9462 - val_loss: 0.1150 - val_accuracy: 0.9800
Epoch 2786/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1388 - accuracy:
0.9531 - val_loss: 0.1433 - val_accuracy: 0.9625
Epoch 2787/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1354 - accuracy:
0.9468 - val_loss: 0.1320 - val_accuracy: 0.9650
Epoch 2788/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1277 - accuracy:
0.9500 - val_loss: 0.0977 - val_accuracy: 0.9750
Epoch 2789/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1229 - accuracy:
0.9518 - val_loss: 0.1049 - val_accuracy: 0.9625
Epoch 2790/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1326 - accuracy:
0.9450 - val_loss: 0.0998 - val_accuracy: 0.9775
Epoch 2791/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1339 - accuracy:
0.9468 - val_loss: 0.1473 - val_accuracy: 0.9750
```

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Epoch 2792/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1407 - accuracy:
0.9462 - val_loss: 0.1304 - val_accuracy: 0.9775
Epoch 2793/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1553 - accuracy:
0.9393 - val_loss: 0.1658 - val_accuracy: 0.9425
Epoch 2794/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1405 - accuracy:
0.9456 - val_loss: 0.1462 - val_accuracy: 0.9425
Epoch 2795/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1526 - accuracy:
0.9306 - val_loss: 0.1083 - val_accuracy: 0.9625
Epoch 2796/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1618 - accuracy:
0.9281 - val_loss: 0.1248 - val_accuracy: 0.9750
Epoch 2797/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1423 - accuracy:
0.9487 - val_loss: 0.1076 - val_accuracy: 0.9750
Epoch 2798/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1227 - accuracy:
0.9575 - val_loss: 0.0997 - val_accuracy: 0.9825
Epoch 2799/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1186 - accuracy:
0.9600 - val_loss: 0.1455 - val_accuracy: 0.9800
Epoch 2800/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1236 - accuracy:
0.9600 - val_loss: 0.1350 - val_accuracy: 0.9625
Epoch 2801/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1266 - accuracy:
0.9493 - val_loss: 0.1028 - val_accuracy: 0.9750
Epoch 2802/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1189 - accuracy:
0.9556 - val_loss: 0.1143 - val_accuracy: 0.9725
Epoch 2803/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1224 - accuracy:
0.9543 - val_loss: 0.1071 - val_accuracy: 0.9825
Epoch 2804/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1194 - accuracy:
0.9606 - val_loss: 0.1047 - val_accuracy: 0.9800
Epoch 2805/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1321 - accuracy:
0.9537 - val_loss: 0.0942 - val_accuracy: 0.9625
Epoch 2806/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1469 - accuracy:
0.9456 - val_loss: 0.1477 - val_accuracy: 0.9150
Epoch 2807/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1318 - accuracy:
0.9443 - val_loss: 0.1216 - val_accuracy: 0.9550
```

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Epoch 2808/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1248 - accuracy:
0.9562 - val_loss: 0.1012 - val_accuracy: 0.9775
Epoch 2809/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1163 - accuracy:
0.9637 - val_loss: 0.1063 - val_accuracy: 0.9750
Epoch 2810/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1329 - accuracy:
0.9562 - val_loss: 0.1013 - val_accuracy: 0.9775
Epoch 2811/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1260 - accuracy:
0.9550 - val_loss: 0.0988 - val_accuracy: 0.9775
Epoch 2812/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1135 - accuracy:
0.9600 - val_loss: 0.0942 - val_accuracy: 0.9675
Epoch 2813/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1247 - accuracy:
0.9518 - val_loss: 0.1155 - val_accuracy: 0.9700
Epoch 2814/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1212 - accuracy:
0.9550 - val_loss: 0.0959 - val_accuracy: 0.9750
Epoch 2815/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1156 - accuracy:
0.9587 - val_loss: 0.1044 - val_accuracy: 0.9850
Epoch 2816/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1116 - accuracy:
0.9619 - val_loss: 0.1281 - val_accuracy: 0.9650
Epoch 2817/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1310 - accuracy:
0.9450 - val_loss: 0.1016 - val_accuracy: 0.9775
Epoch 2818/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1385 - accuracy:
0.9443 - val_loss: 0.1358 - val_accuracy: 0.9525
Epoch 2819/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1289 - accuracy:
0.9543 - val_loss: 0.0907 - val_accuracy: 0.9700
Epoch 2820/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1350 - accuracy:
0.9500 - val_loss: 0.1151 - val_accuracy: 0.9825
Epoch 2821/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1645 - accuracy:
0.9312 - val_loss: 0.1149 - val_accuracy: 0.9800
Epoch 2822/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1288 - accuracy:
0.9518 - val_loss: 0.1414 - val_accuracy: 0.9400
Epoch 2823/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1257 - accuracy:
0.9493 - val_loss: 0.1379 - val_accuracy: 0.9625
```

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Epoch 2824/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1259 - accuracy:
0.9556 - val_loss: 0.1387 - val_accuracy: 0.9500
Epoch 2825/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1318 - accuracy:
0.9462 - val_loss: 0.0990 - val_accuracy: 0.9875
Epoch 2826/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1229 - accuracy:
0.9556 - val_loss: 0.1049 - val_accuracy: 0.9725
Epoch 2827/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1265 - accuracy:
0.9537 - val_loss: 0.1189 - val_accuracy: 0.9575
Epoch 2828/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1197 - accuracy:
0.9575 - val_loss: 0.0951 - val_accuracy: 0.9700
Epoch 2829/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1275 - accuracy:
0.9512 - val_loss: 0.1417 - val_accuracy: 0.9175
Epoch 2830/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1345 - accuracy:
0.9456 - val_loss: 0.1508 - val_accuracy: 0.9150
Epoch 2831/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1500 - accuracy:
0.9406 - val_loss: 0.0932 - val_accuracy: 0.9675
Epoch 2832/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1481 - accuracy:
0.9425 - val_loss: 0.1177 - val_accuracy: 0.9525
Epoch 2833/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1292 - accuracy:
0.9487 - val_loss: 0.0837 - val_accuracy: 0.9675
Epoch 2834/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1184 - accuracy:
0.9619 - val_loss: 0.1206 - val_accuracy: 0.9575
Epoch 2835/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1398 - accuracy:
0.9468 - val_loss: 0.1298 - val_accuracy: 0.9550
Epoch 2836/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1524 - accuracy:
0.9356 - val_loss: 0.1204 - val_accuracy: 0.9675
Epoch 2837/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1514 - accuracy:
0.9362 - val_loss: 0.1125 - val_accuracy: 0.9600
Epoch 2838/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1235 - accuracy:
0.9556 - val_loss: 0.1205 - val_accuracy: 0.9800
Epoch 2839/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1337 - accuracy:
0.9500 - val_loss: 0.1011 - val_accuracy: 0.9700
```

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Epoch 2840/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1215 - accuracy:
0.9556 - val_loss: 0.0951 - val_accuracy: 0.9675
Epoch 2841/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1183 - accuracy:
0.9593 - val_loss: 0.1026 - val_accuracy: 0.9800
Epoch 2842/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1255 - accuracy:
0.9537 - val_loss: 0.1056 - val_accuracy: 0.9850
Epoch 2843/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1232 - accuracy:
0.9556 - val_loss: 0.0989 - val_accuracy: 0.9750
Epoch 2844/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1207 - accuracy:
0.9531 - val_loss: 0.1073 - val_accuracy: 0.9725
Epoch 2845/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1277 - accuracy:
0.9550 - val_loss: 0.1157 - val_accuracy: 0.9725
Epoch 2846/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1234 - accuracy:
0.9543 - val_loss: 0.1241 - val_accuracy: 0.9775
Epoch 2847/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1264 - accuracy:
0.9568 - val_loss: 0.1176 - val_accuracy: 0.9750
Epoch 2848/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1260 - accuracy:
0.9537 - val_loss: 0.1475 - val_accuracy: 0.9400
Epoch 2849/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1417 - accuracy:
0.9475 - val_loss: 0.1088 - val_accuracy: 0.9675
Epoch 2850/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1493 - accuracy:
0.9343 - val_loss: 0.1435 - val_accuracy: 0.9375
Epoch 2851/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1265 - accuracy:
0.9575 - val_loss: 0.1081 - val_accuracy: 0.9850
Epoch 2852/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1339 - accuracy:
0.9456 - val_loss: 0.1621 - val_accuracy: 0.9325
Epoch 2853/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1580 - accuracy:
0.9331 - val_loss: 0.2250 - val_accuracy: 0.9450
Epoch 2854/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1436 - accuracy:
0.9431 - val_loss: 0.1168 - val_accuracy: 0.9775
Epoch 2855/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1314 - accuracy:
0.9493 - val_loss: 0.1991 - val_accuracy: 0.9125
```

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Epoch 2856/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1361 - accuracy:
0.9437 - val_loss: 0.1169 - val_accuracy: 0.9825
Epoch 2857/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1253 - accuracy:
0.9543 - val_loss: 0.1087 - val_accuracy: 0.9825
Epoch 2858/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1165 - accuracy:
0.9568 - val_loss: 0.1065 - val_accuracy: 0.9725
Epoch 2859/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1161 - accuracy:
0.9600 - val_loss: 0.1549 - val_accuracy: 0.9300
Epoch 2860/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1269 - accuracy:
0.9531 - val_loss: 0.1196 - val_accuracy: 0.9750
Epoch 2861/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1209 - accuracy:
0.9550 - val_loss: 0.1067 - val_accuracy: 0.9825
Epoch 2862/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1161 - accuracy:
0.9575 - val_loss: 0.1275 - val_accuracy: 0.9375
Epoch 2863/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1328 - accuracy:
0.9443 - val_loss: 0.1138 - val_accuracy: 0.9750
Epoch 2864/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1175 - accuracy:
0.9593 - val_loss: 0.1238 - val_accuracy: 0.9375
Epoch 2865/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1229 - accuracy:
0.9587 - val_loss: 0.1021 - val_accuracy: 0.9825
Epoch 2866/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1154 - accuracy:
0.9562 - val_loss: 0.1007 - val_accuracy: 0.9875
Epoch 2867/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1328 - accuracy:
0.9475 - val_loss: 0.1754 - val_accuracy: 0.9275
Epoch 2868/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1605 - accuracy:
0.9387 - val_loss: 0.2073 - val_accuracy: 0.9075
Epoch 2869/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.2330 - accuracy:
0.9043 - val_loss: 0.2219 - val_accuracy: 0.9050
Epoch 2870/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1354 - accuracy:
0.9443 - val_loss: 0.1018 - val_accuracy: 0.9800
Epoch 2871/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1200 - accuracy:
0.9600 - val_loss: 0.1000 - val_accuracy: 0.9625
```

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Epoch 2872/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1209 - accuracy:
0.9575 - val_loss: 0.0950 - val_accuracy: 0.9700
Epoch 2873/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1201 - accuracy:
0.9568 - val_loss: 0.1155 - val_accuracy: 0.9525
Epoch 2874/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1664 - accuracy:
0.9275 - val_loss: 0.1253 - val_accuracy: 0.9675
Epoch 2875/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2132 - accuracy:
0.9056 - val_loss: 0.2627 - val_accuracy: 0.9050
Epoch 2876/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2324 - accuracy:
0.9206 - val_loss: 0.3808 - val_accuracy: 0.8975
Epoch 2877/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2645 - accuracy:
0.9131 - val_loss: 0.1235 - val_accuracy: 0.9725
Epoch 2878/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1758 - accuracy:
0.9350 - val_loss: 0.1204 - val_accuracy: 0.9725
Epoch 2879/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1369 - accuracy:
0.9462 - val_loss: 0.1038 - val_accuracy: 0.9650
Epoch 2880/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1302 - accuracy:
0.9506 - val_loss: 0.1004 - val_accuracy: 0.9850
Epoch 2881/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1223 - accuracy:
0.9581 - val_loss: 0.1177 - val_accuracy: 0.9850
Epoch 2882/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1299 - accuracy:
0.9506 - val_loss: 0.1154 - val_accuracy: 0.9675
Epoch 2883/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1180 - accuracy:
0.9593 - val_loss: 0.1252 - val_accuracy: 0.9750
Epoch 2884/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1217 - accuracy:
0.9562 - val_loss: 0.1060 - val_accuracy: 0.9825
Epoch 2885/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1244 - accuracy:
0.9487 - val_loss: 0.1293 - val_accuracy: 0.9750
Epoch 2886/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1321 - accuracy:
0.9481 - val_loss: 0.0956 - val_accuracy: 0.9800
Epoch 2887/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1212 - accuracy:
0.9562 - val_loss: 0.0972 - val_accuracy: 0.9725
```

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Epoch 2888/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1153 - accuracy:
0.9612 - val_loss: 0.1192 - val_accuracy: 0.9600
Epoch 2889/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1278 - accuracy:
0.9512 - val_loss: 0.1111 - val_accuracy: 0.9700
Epoch 2890/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1172 - accuracy:
0.9562 - val_loss: 0.1162 - val_accuracy: 0.9875
Epoch 2891/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1225 - accuracy:
0.9556 - val_loss: 0.1292 - val_accuracy: 0.9800
Epoch 2892/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1155 - accuracy:
0.9562 - val_loss: 0.1313 - val_accuracy: 0.9475
Epoch 2893/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1288 - accuracy:
0.9475 - val_loss: 0.1243 - val_accuracy: 0.9800
Epoch 2894/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1442 - accuracy:
0.9425 - val_loss: 0.1247 - val_accuracy: 0.9575
Epoch 2895/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1310 - accuracy:
0.9468 - val_loss: 0.0963 - val_accuracy: 0.9775
Epoch 2896/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1229 - accuracy:
0.9550 - val_loss: 0.2093 - val_accuracy: 0.9025
Epoch 2897/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1858 - accuracy:
0.9225 - val_loss: 0.1343 - val_accuracy: 0.9525
Epoch 2898/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1623 - accuracy:
0.9381 - val_loss: 0.1359 - val_accuracy: 0.9525
Epoch 2899/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1411 - accuracy:
0.9387 - val_loss: 0.1055 - val_accuracy: 0.9625
Epoch 2900/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1198 - accuracy:
0.9556 - val_loss: 0.0987 - val_accuracy: 0.9725
Epoch 2901/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1220 - accuracy:
0.9562 - val_loss: 0.1059 - val_accuracy: 0.9750
Epoch 2902/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1366 - accuracy:
0.9431 - val_loss: 0.2143 - val_accuracy: 0.9025
Epoch 2903/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1253 - accuracy:
0.9512 - val_loss: 0.0971 - val_accuracy: 0.9700
```

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Epoch 2904/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1372 - accuracy:
0.9400 - val_loss: 0.1158 - val_accuracy: 0.9600
Epoch 2905/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1311 - accuracy:
0.9481 - val_loss: 0.1443 - val_accuracy: 0.9575
Epoch 2906/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1234 - accuracy:
0.9568 - val_loss: 0.1107 - val_accuracy: 0.9725
Epoch 2907/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1287 - accuracy:
0.9487 - val_loss: 0.1009 - val_accuracy: 0.9625
Epoch 2908/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1237 - accuracy:
0.9550 - val_loss: 0.1141 - val_accuracy: 0.9700
Epoch 2909/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1239 - accuracy:
0.9537 - val_loss: 0.1111 - val_accuracy: 0.9775
Epoch 2910/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1314 - accuracy:
0.9487 - val_loss: 0.1227 - val_accuracy: 0.9525
Epoch 2911/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1700 - accuracy:
0.9300 - val_loss: 0.1571 - val_accuracy: 0.9500
Epoch 2912/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1391 - accuracy:
0.9468 - val_loss: 0.1031 - val_accuracy: 0.9850
Epoch 2913/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1280 - accuracy:
0.9537 - val_loss: 0.0956 - val_accuracy: 0.9750
Epoch 2914/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1203 - accuracy:
0.9556 - val_loss: 0.1217 - val_accuracy: 0.9825
Epoch 2915/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1281 - accuracy:
0.9493 - val_loss: 0.1130 - val_accuracy: 0.9700
Epoch 2916/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1203 - accuracy:
0.9543 - val_loss: 0.1076 - val_accuracy: 0.9775
Epoch 2917/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1207 - accuracy:
0.9543 - val_loss: 0.1038 - val_accuracy: 0.9700
Epoch 2918/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1227 - accuracy:
0.9593 - val_loss: 0.1358 - val_accuracy: 0.9650
Epoch 2919/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1394 - accuracy:
0.9518 - val_loss: 0.1513 - val_accuracy: 0.9350
```

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Epoch 2920/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1265 - accuracy:
0.9487 - val_loss: 0.1113 - val_accuracy: 0.9725
Epoch 2921/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1148 - accuracy:
0.9575 - val_loss: 0.1180 - val_accuracy: 0.9675
Epoch 2922/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1337 - accuracy:
0.9468 - val_loss: 0.1250 - val_accuracy: 0.9700
Epoch 2923/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1563 - accuracy:
0.9387 - val_loss: 0.1618 - val_accuracy: 0.9175
Epoch 2924/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1351 - accuracy:
0.9437 - val_loss: 0.0960 - val_accuracy: 0.9800
Epoch 2925/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1131 - accuracy:
0.9612 - val_loss: 0.0969 - val_accuracy: 0.9750
Epoch 2926/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1193 - accuracy:
0.9562 - val_loss: 0.1002 - val_accuracy: 0.9800
Epoch 2927/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1205 - accuracy:
0.9568 - val_loss: 0.0983 - val_accuracy: 0.9650
Epoch 2928/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1318 - accuracy:
0.9443 - val_loss: 0.1111 - val_accuracy: 0.9575
Epoch 2929/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1279 - accuracy:
0.9518 - val_loss: 0.0990 - val_accuracy: 0.9725
Epoch 2930/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1254 - accuracy:
0.9500 - val_loss: 0.1028 - val_accuracy: 0.9775
Epoch 2931/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1137 - accuracy:
0.9631 - val_loss: 0.1028 - val_accuracy: 0.9875
Epoch 2932/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1185 - accuracy:
0.9587 - val_loss: 0.1431 - val_accuracy: 0.9700
Epoch 2933/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1233 - accuracy:
0.9575 - val_loss: 0.1055 - val_accuracy: 0.9725
Epoch 2934/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1174 - accuracy:
0.9600 - val_loss: 0.0980 - val_accuracy: 0.9800
Epoch 2935/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1261 - accuracy:
0.9550 - val_loss: 0.2001 - val_accuracy: 0.9175
```

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Epoch 2936/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1703 - accuracy:
0.9262 - val_loss: 0.1946 - val_accuracy: 0.9125
Epoch 2937/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1637 - accuracy:
0.9243 - val_loss: 0.1066 - val_accuracy: 0.9725
Epoch 2938/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1427 - accuracy:
0.9425 - val_loss: 0.1281 - val_accuracy: 0.9575
Epoch 2939/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1326 - accuracy:
0.9487 - val_loss: 0.1257 - val_accuracy: 0.9450
Epoch 2940/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1300 - accuracy:
0.9531 - val_loss: 0.1016 - val_accuracy: 0.9775
Epoch 2941/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1318 - accuracy:
0.9500 - val_loss: 0.0920 - val_accuracy: 0.9725
Epoch 2942/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1292 - accuracy:
0.9462 - val_loss: 0.1080 - val_accuracy: 0.9575
Epoch 2943/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1353 - accuracy:
0.9500 - val_loss: 0.0980 - val_accuracy: 0.9700
Epoch 2944/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1446 - accuracy:
0.9406 - val_loss: 0.1997 - val_accuracy: 0.9050
Epoch 2945/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1741 - accuracy:
0.9206 - val_loss: 0.1701 - val_accuracy: 0.9125
Epoch 2946/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1575 - accuracy:
0.9456 - val_loss: 0.1318 - val_accuracy: 0.9675
Epoch 2947/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1396 - accuracy:
0.9406 - val_loss: 0.1032 - val_accuracy: 0.9750
Epoch 2948/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1183 - accuracy:
0.9587 - val_loss: 0.1198 - val_accuracy: 0.9525
Epoch 2949/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1283 - accuracy:
0.9581 - val_loss: 0.1125 - val_accuracy: 0.9850
Epoch 2950/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1222 - accuracy:
0.9537 - val_loss: 0.0911 - val_accuracy: 0.9675
Epoch 2951/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1204 - accuracy:
0.9537 - val_loss: 0.1290 - val_accuracy: 0.9725
```

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Epoch 2952/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1669 - accuracy:
0.9456 - val_loss: 0.1062 - val_accuracy: 0.9700
Epoch 2953/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2062 - accuracy:
0.9168 - val_loss: 0.1757 - val_accuracy: 0.9275
Epoch 2954/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1463 - accuracy:
0.9387 - val_loss: 0.0932 - val_accuracy: 0.9825
Epoch 2955/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1201 - accuracy:
0.9606 - val_loss: 0.1432 - val_accuracy: 0.9725
Epoch 2956/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1241 - accuracy:
0.9581 - val_loss: 0.1118 - val_accuracy: 0.9850
Epoch 2957/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1166 - accuracy:
0.9612 - val_loss: 0.1254 - val_accuracy: 0.9800
Epoch 2958/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1204 - accuracy:
0.9575 - val_loss: 0.1120 - val_accuracy: 0.9775
Epoch 2959/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1237 - accuracy:
0.9575 - val_loss: 0.1468 - val_accuracy: 0.9700
Epoch 2960/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1222 - accuracy:
0.9575 - val_loss: 0.1220 - val_accuracy: 0.9550
Epoch 2961/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1375 - accuracy:
0.9431 - val_loss: 0.1172 - val_accuracy: 0.9700
Epoch 2962/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1505 - accuracy:
0.9368 - val_loss: 0.1150 - val_accuracy: 0.9800
Epoch 2963/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1530 - accuracy:
0.9400 - val_loss: 0.1676 - val_accuracy: 0.9225
Epoch 2964/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1656 - accuracy:
0.9350 - val_loss: 0.1201 - val_accuracy: 0.9775
Epoch 2965/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1536 - accuracy:
0.9368 - val_loss: 0.0987 - val_accuracy: 0.9575
Epoch 2966/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1351 - accuracy:
0.9450 - val_loss: 0.1040 - val_accuracy: 0.9625
Epoch 2967/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1282 - accuracy:
0.9493 - val_loss: 0.0913 - val_accuracy: 0.9775
```

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Epoch 2968/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1185 - accuracy:
0.9531 - val_loss: 0.1012 - val_accuracy: 0.9875
Epoch 2969/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1172 - accuracy:
0.9600 - val_loss: 0.1057 - val_accuracy: 0.9750
Epoch 2970/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1179 - accuracy:
0.9543 - val_loss: 0.1000 - val_accuracy: 0.9725
Epoch 2971/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1265 - accuracy:
0.9487 - val_loss: 0.1362 - val_accuracy: 0.9375
Epoch 2972/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1320 - accuracy:
0.9443 - val_loss: 0.1168 - val_accuracy: 0.9700
Epoch 2973/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1202 - accuracy:
0.9575 - val_loss: 0.1460 - val_accuracy: 0.9425
Epoch 2974/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1175 - accuracy:
0.9543 - val_loss: 0.1361 - val_accuracy: 0.9425
Epoch 2975/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1301 - accuracy:
0.9500 - val_loss: 0.0882 - val_accuracy: 0.9750
Epoch 2976/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1298 - accuracy:
0.9500 - val_loss: 0.0905 - val_accuracy: 0.9750
Epoch 2977/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1235 - accuracy:
0.9556 - val_loss: 0.1128 - val_accuracy: 0.9525
Epoch 2978/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1249 - accuracy:
0.9468 - val_loss: 0.1017 - val_accuracy: 0.9750
Epoch 2979/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1180 - accuracy:
0.9562 - val_loss: 0.0923 - val_accuracy: 0.9675
Epoch 2980/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1357 - accuracy:
0.9531 - val_loss: 0.1115 - val_accuracy: 0.9575
Epoch 2981/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1515 - accuracy:
0.9318 - val_loss: 0.1235 - val_accuracy: 0.9625
Epoch 2982/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1525 - accuracy:
0.9418 - val_loss: 0.1041 - val_accuracy: 0.9700
Epoch 2983/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1366 - accuracy:
0.9475 - val_loss: 0.0889 - val_accuracy: 0.9650
```

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Epoch 2984/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1276 - accuracy:
0.9500 - val_loss: 0.0872 - val_accuracy: 0.9800
Epoch 2985/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1209 - accuracy:
0.9593 - val_loss: 0.0921 - val_accuracy: 0.9750
Epoch 2986/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1196 - accuracy:
0.9581 - val_loss: 0.0909 - val_accuracy: 0.9700
Epoch 2987/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1219 - accuracy:
0.9550 - val_loss: 0.1004 - val_accuracy: 0.9725
Epoch 2988/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1149 - accuracy:
0.9543 - val_loss: 0.0985 - val_accuracy: 0.9725
Epoch 2989/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1376 - accuracy:
0.9450 - val_loss: 0.1057 - val_accuracy: 0.9650
Epoch 2990/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1312 - accuracy:
0.9431 - val_loss: 0.1286 - val_accuracy: 0.9550
Epoch 2991/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1255 - accuracy:
0.9550 - val_loss: 0.1076 - val_accuracy: 0.9850
Epoch 2992/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1205 - accuracy:
0.9537 - val_loss: 0.1534 - val_accuracy: 0.9550
Epoch 2993/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1473 - accuracy:
0.9443 - val_loss: 0.1424 - val_accuracy: 0.9650
Epoch 2994/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1451 - accuracy:
0.9381 - val_loss: 0.1493 - val_accuracy: 0.9350
Epoch 2995/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1404 - accuracy:
0.9443 - val_loss: 0.1200 - val_accuracy: 0.9550
Epoch 2996/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1296 - accuracy:
0.9450 - val_loss: 0.0929 - val_accuracy: 0.9675
Epoch 2997/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1562 - accuracy:
0.9306 - val_loss: 0.2737 - val_accuracy: 0.8850
Epoch 2998/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.2145 - accuracy:
0.9087 - val_loss: 0.1432 - val_accuracy: 0.9500
Epoch 2999/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1619 - accuracy:
0.9312 - val_loss: 0.1159 - val_accuracy: 0.9650
```

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Epoch 3000/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1329 - accuracy:
0.9475 - val_loss: 0.1066 - val_accuracy: 0.9725
Epoch 3001/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1280 - accuracy:
0.9456 - val_loss: 0.0972 - val_accuracy: 0.9575
Epoch 3002/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1324 - accuracy:
0.9500 - val_loss: 0.1224 - val_accuracy: 0.9700
Epoch 3003/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1208 - accuracy:
0.9568 - val_loss: 0.1257 - val_accuracy: 0.9775
Epoch 3004/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1382 - accuracy:
0.9487 - val_loss: 0.1473 - val_accuracy: 0.9300
Epoch 3005/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1357 - accuracy:
0.9456 - val_loss: 0.0987 - val_accuracy: 0.9825
Epoch 3006/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1287 - accuracy:
0.9568 - val_loss: 0.1089 - val_accuracy: 0.9775
Epoch 3007/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1165 - accuracy:
0.9625 - val_loss: 0.0962 - val_accuracy: 0.9725
Epoch 3008/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1237 - accuracy:
0.9525 - val_loss: 0.0981 - val_accuracy: 0.9850
Epoch 3009/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1229 - accuracy:
0.9600 - val_loss: 0.1033 - val_accuracy: 0.9750
Epoch 3010/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1215 - accuracy:
0.9581 - val_loss: 0.0987 - val_accuracy: 0.9750
Epoch 3011/5000
13/13 [==============================] - 0s 8ms/step - loss: 0.1136 - accuracy:
0.9593 - val_loss: 0.1210 - val_accuracy: 0.9825
Epoch 3012/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1163 - accuracy:
0.9600 - val_loss: 0.1191 - val_accuracy: 0.9850
Epoch 3013/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1158 - accuracy:
0.9556 - val_loss: 0.1379 - val_accuracy: 0.9675
Epoch 3014/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1246 - accuracy:
0.9543 - val_loss: 0.1385 - val_accuracy: 0.9375
Epoch 3015/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1188 - accuracy:
0.9556 - val_loss: 0.1161 - val_accuracy: 0.9400
```

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Epoch 3016/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1373 - accuracy:
0.9425 - val_loss: 0.1105 - val_accuracy: 0.9750
Epoch 3017/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1206 - accuracy:
0.9593 - val_loss: 0.0979 - val_accuracy: 0.9700
Epoch 3018/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1272 - accuracy:
0.9556 - val_loss: 0.0886 - val_accuracy: 0.9750
Epoch 3019/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1148 - accuracy:
0.9587 - val_loss: 0.1135 - val_accuracy: 0.9675
Epoch 3020/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1173 - accuracy:
0.9512 - val_loss: 0.1074 - val_accuracy: 0.9825
Epoch 3021/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1183 - accuracy:
0.9550 - val_loss: 0.0914 - val_accuracy: 0.9750
Epoch 3022/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1254 - accuracy:
0.9468 - val_loss: 0.1191 - val_accuracy: 0.9325
Epoch 3023/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1242 - accuracy:
0.9512 - val_loss: 0.1570 - val_accuracy: 0.9225
Epoch 3024/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1648 - accuracy:
0.9268 - val_loss: 0.1079 - val_accuracy: 0.9700
Epoch 3025/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1389 - accuracy:
0.9437 - val_loss: 0.1125 - val_accuracy: 0.9725
Epoch 3026/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1339 - accuracy:
0.9443 - val_loss: 0.1016 - val_accuracy: 0.9800
Epoch 3027/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1401 - accuracy:
0.9462 - val_loss: 0.1043 - val_accuracy: 0.9575
Epoch 3028/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1135 - accuracy:
0.9619 - val_loss: 0.0887 - val_accuracy: 0.9725
Epoch 3029/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1142 - accuracy:
0.9612 - val_loss: 0.1003 - val_accuracy: 0.9825
Epoch 3030/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1334 - accuracy:
0.9493 - val_loss: 0.1488 - val_accuracy: 0.9325
Epoch 3031/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1819 - accuracy:
0.9312 - val_loss: 0.3361 - val_accuracy: 0.8700
```

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Epoch 3032/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.3095 - accuracy:
0.8849 - val_loss: 0.2439 - val_accuracy: 0.9225
Epoch 3033/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1914 - accuracy:
0.9287 - val_loss: 0.1769 - val_accuracy: 0.9200
Epoch 3034/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1632 - accuracy:
0.9293 - val_loss: 0.0965 - val_accuracy: 0.9825
Epoch 3035/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1255 - accuracy:
0.9556 - val_loss: 0.0975 - val_accuracy: 0.9800
Epoch 3036/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1146 - accuracy:
0.9587 - val_loss: 0.1453 - val_accuracy: 0.9650
Epoch 3037/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1146 - accuracy:
0.9606 - val_loss: 0.1003 - val_accuracy: 0.9700
Epoch 3038/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1268 - accuracy:
0.9525 - val_loss: 0.0936 - val_accuracy: 0.9700
Epoch 3039/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1307 - accuracy:
0.9518 - val_loss: 0.1466 - val_accuracy: 0.9325
Epoch 3040/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1192 - accuracy:
0.9612 - val_loss: 0.0939 - val_accuracy: 0.9825
Epoch 3041/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1225 - accuracy:
0.9581 - val_loss: 0.1079 - val_accuracy: 0.9850
Epoch 3042/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1402 - accuracy:
0.9431 - val_loss: 0.1107 - val_accuracy: 0.9600
Epoch 3043/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1200 - accuracy:
0.9531 - val_loss: 0.1175 - val_accuracy: 0.9725
Epoch 3044/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1279 - accuracy:
0.9512 - val_loss: 0.1366 - val_accuracy: 0.9800
Epoch 3045/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1214 - accuracy:
0.9531 - val_loss: 0.0958 - val_accuracy: 0.9775
Epoch 3046/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1166 - accuracy:
0.9556 - val_loss: 0.1014 - val_accuracy: 0.9700
Epoch 3047/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1181 - accuracy:
0.9556 - val_loss: 0.0870 - val_accuracy: 0.9775
```

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Epoch 3048/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1181 - accuracy:
0.9575 - val_loss: 0.0899 - val_accuracy: 0.9825
Epoch 3049/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1252 - accuracy:
0.9462 - val_loss: 0.0918 - val_accuracy: 0.9725
Epoch 3050/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1210 - accuracy:
0.9556 - val_loss: 0.1069 - val_accuracy: 0.9850
Epoch 3051/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1166 - accuracy:
0.9587 - val_loss: 0.0990 - val_accuracy: 0.9850
Epoch 3052/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1160 - accuracy:
0.9587 - val_loss: 0.0945 - val_accuracy: 0.9725
Epoch 3053/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1157 - accuracy:
0.9619 - val_loss: 0.1070 - val_accuracy: 0.9800
Epoch 3054/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1211 - accuracy:
0.9550 - val_loss: 0.1261 - val_accuracy: 0.9500
Epoch 3055/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1203 - accuracy:
0.9556 - val_loss: 0.1130 - val_accuracy: 0.9475
Epoch 3056/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1236 - accuracy:
0.9506 - val_loss: 0.0980 - val_accuracy: 0.9675
Epoch 3057/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1381 - accuracy:
0.9468 - val_loss: 0.1528 - val_accuracy: 0.9400
Epoch 3058/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1268 - accuracy:
0.9512 - val_loss: 0.1103 - val_accuracy: 0.9750
Epoch 3059/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1359 - accuracy:
0.9500 - val_loss: 0.1563 - val_accuracy: 0.9225
Epoch 3060/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1250 - accuracy:
0.9531 - val_loss: 0.0902 - val_accuracy: 0.9825
Epoch 3061/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1252 - accuracy:
0.9531 - val_loss: 0.1381 - val_accuracy: 0.9450
Epoch 3062/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1194 - accuracy:
0.9550 - val_loss: 0.1247 - val_accuracy: 0.9500
Epoch 3063/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1111 - accuracy:
0.9581 - val_loss: 0.0885 - val_accuracy: 0.9700
```

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Epoch 3064/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1195 - accuracy:
0.9606 - val_loss: 0.1076 - val_accuracy: 0.9550
Epoch 3065/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1214 - accuracy:
0.9562 - val_loss: 0.0853 - val_accuracy: 0.9750
Epoch 3066/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1319 - accuracy:
0.9518 - val_loss: 0.0848 - val_accuracy: 0.9750
Epoch 3067/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1203 - accuracy:
0.9568 - val_loss: 0.0922 - val_accuracy: 0.9850
Epoch 3068/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1216 - accuracy:
0.9550 - val_loss: 0.0970 - val_accuracy: 0.9775
Epoch 3069/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1169 - accuracy:
0.9587 - val_loss: 0.0907 - val_accuracy: 0.9850
Epoch 3070/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1222 - accuracy:
0.9518 - val_loss: 0.1167 - val_accuracy: 0.9725
Epoch 3071/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1206 - accuracy:
0.9550 - val_loss: 0.1242 - val_accuracy: 0.9450
Epoch 3072/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1512 - accuracy:
0.9312 - val_loss: 0.0992 - val_accuracy: 0.9725
Epoch 3073/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1843 - accuracy:
0.9168 - val_loss: 0.1060 - val_accuracy: 0.9675
Epoch 3074/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1564 - accuracy:
0.9381 - val_loss: 0.1115 - val_accuracy: 0.9775
Epoch 3075/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1272 - accuracy:
0.9543 - val_loss: 0.1446 - val_accuracy: 0.9775
Epoch 3076/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1343 - accuracy:
0.9443 - val_loss: 0.1107 - val_accuracy: 0.9525
Epoch 3077/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1232 - accuracy:
0.9550 - val_loss: 0.1156 - val_accuracy: 0.9725
Epoch 3078/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1197 - accuracy:
0.9568 - val_loss: 0.0824 - val_accuracy: 0.9700
Epoch 3079/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1229 - accuracy:
0.9512 - val_loss: 0.1158 - val_accuracy: 0.9550
```

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Epoch 3080/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1432 - accuracy:
0.9475 - val_loss: 0.1021 - val_accuracy: 0.9700
Epoch 3081/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1404 - accuracy:
0.9425 - val_loss: 0.0947 - val_accuracy: 0.9725
Epoch 3082/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1237 - accuracy:
0.9550 - val_loss: 0.1343 - val_accuracy: 0.9750
Epoch 3083/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1358 - accuracy:
0.9481 - val_loss: 0.1266 - val_accuracy: 0.9775
Epoch 3084/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1385 - accuracy:
0.9450 - val_loss: 0.2210 - val_accuracy: 0.9550
Epoch 3085/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1626 - accuracy:
0.9356 - val_loss: 0.1187 - val_accuracy: 0.9650
Epoch 3086/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1358 - accuracy:
0.9531 - val_loss: 0.0835 - val_accuracy: 0.9775
Epoch 3087/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1343 - accuracy:
0.9475 - val_loss: 0.1232 - val_accuracy: 0.9325
Epoch 3088/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1186 - accuracy:
0.9531 - val_loss: 0.0928 - val_accuracy: 0.9800
Epoch 3089/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1248 - accuracy:
0.9518 - val_loss: 0.0865 - val_accuracy: 0.9775
Epoch 3090/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1308 - accuracy:
0.9475 - val_loss: 0.0990 - val_accuracy: 0.9750
Epoch 3091/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1175 - accuracy:
0.9600 - val_loss: 0.0996 - val_accuracy: 0.9725
Epoch 3092/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1232 - accuracy:
0.9525 - val_loss: 0.0916 - val_accuracy: 0.9800
Epoch 3093/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1161 - accuracy:
0.9619 - val_loss: 0.0909 - val_accuracy: 0.9725
Epoch 3094/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1104 - accuracy:
0.9612 - val_loss: 0.0975 - val_accuracy: 0.9625
Epoch 3095/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1257 - accuracy:
0.9550 - val_loss: 0.0874 - val_accuracy: 0.9700
```

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Epoch 3096/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1381 - accuracy:
0.9481 - val_loss: 0.1474 - val_accuracy: 0.9400
Epoch 3097/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1131 - accuracy:
0.9575 - val_loss: 0.1099 - val_accuracy: 0.9625
Epoch 3098/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1180 - accuracy:
0.9518 - val_loss: 0.0944 - val_accuracy: 0.9850
Epoch 3099/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1254 - accuracy:
0.9518 - val_loss: 0.1248 - val_accuracy: 0.9575
Epoch 3100/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1555 - accuracy:
0.9375 - val_loss: 0.1128 - val_accuracy: 0.9700
Epoch 3101/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1367 - accuracy:
0.9412 - val_loss: 0.0993 - val_accuracy: 0.9775
Epoch 3102/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1173 - accuracy:
0.9612 - val_loss: 0.1021 - val_accuracy: 0.9600
Epoch 3103/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1149 - accuracy:
0.9600 - val_loss: 0.0902 - val_accuracy: 0.9675
Epoch 3104/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1248 - accuracy:
0.9550 - val_loss: 0.0933 - val_accuracy: 0.9775
Epoch 3105/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1197 - accuracy:
0.9525 - val_loss: 0.1076 - val_accuracy: 0.9850
Epoch 3106/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1113 - accuracy:
0.9587 - val_loss: 0.1045 - val_accuracy: 0.9750
Epoch 3107/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1159 - accuracy:
0.9575 - val_loss: 0.1154 - val_accuracy: 0.9550
Epoch 3108/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1282 - accuracy:
0.9468 - val_loss: 0.0934 - val_accuracy: 0.9725
Epoch 3109/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1454 - accuracy:
0.9400 - val_loss: 0.2467 - val_accuracy: 0.8925
Epoch 3110/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1532 - accuracy:
0.9375 - val_loss: 0.0965 - val_accuracy: 0.9750
Epoch 3111/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1289 - accuracy:
0.9512 - val_loss: 0.0946 - val_accuracy: 0.9850
```

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Epoch 3112/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1174 - accuracy:
0.9537 - val_loss: 0.0920 - val_accuracy: 0.9700
Epoch 3113/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1190 - accuracy:
0.9562 - val_loss: 0.0847 - val_accuracy: 0.9750
Epoch 3114/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1181 - accuracy:
0.9550 - val_loss: 0.0908 - val_accuracy: 0.9700
Epoch 3115/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1149 - accuracy:
0.9556 - val_loss: 0.1019 - val_accuracy: 0.9850
Epoch 3116/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1248 - accuracy:
0.9506 - val_loss: 0.0968 - val_accuracy: 0.9675
Epoch 3117/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1525 - accuracy:
0.9343 - val_loss: 0.1855 - val_accuracy: 0.9225
Epoch 3118/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1219 - accuracy:
0.9537 - val_loss: 0.1055 - val_accuracy: 0.9650
Epoch 3119/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1191 - accuracy:
0.9575 - val_loss: 0.1133 - val_accuracy: 0.9825
Epoch 3120/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1208 - accuracy:
0.9556 - val_loss: 0.1075 - val_accuracy: 0.9650
Epoch 3121/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1275 - accuracy:
0.9493 - val_loss: 0.0965 - val_accuracy: 0.9825
Epoch 3122/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1179 - accuracy:
0.9593 - val_loss: 0.1130 - val_accuracy: 0.9575
Epoch 3123/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1276 - accuracy:
0.9487 - val_loss: 0.1125 - val_accuracy: 0.9550
Epoch 3124/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1518 - accuracy:
0.9368 - val_loss: 0.1024 - val_accuracy: 0.9575
Epoch 3125/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1318 - accuracy:
0.9462 - val_loss: 0.1038 - val_accuracy: 0.9700
Epoch 3126/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1219 - accuracy:
0.9525 - val_loss: 0.1222 - val_accuracy: 0.9525
Epoch 3127/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1274 - accuracy:
0.9506 - val_loss: 0.1350 - val_accuracy: 0.9675
```

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Epoch 3128/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1378 - accuracy:
0.9543 - val_loss: 0.1275 - val_accuracy: 0.9425
Epoch 3129/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1448 - accuracy:
0.9337 - val_loss: 0.1554 - val_accuracy: 0.9250
Epoch 3130/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1324 - accuracy:
0.9418 - val_loss: 0.1358 - val_accuracy: 0.9425
Epoch 3131/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1382 - accuracy:
0.9381 - val_loss: 0.0927 - val_accuracy: 0.9825
Epoch 3132/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1277 - accuracy:
0.9475 - val_loss: 0.0928 - val_accuracy: 0.9775
Epoch 3133/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1189 - accuracy:
0.9587 - val_loss: 0.0945 - val_accuracy: 0.9775
Epoch 3134/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1212 - accuracy:
0.9543 - val_loss: 0.0931 - val_accuracy: 0.9825
Epoch 3135/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1145 - accuracy:
0.9581 - val_loss: 0.0803 - val_accuracy: 0.9775
Epoch 3136/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1381 - accuracy:
0.9462 - val_loss: 0.0925 - val_accuracy: 0.9725
Epoch 3137/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1366 - accuracy:
0.9525 - val_loss: 0.1109 - val_accuracy: 0.9775
Epoch 3138/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1384 - accuracy:
0.9456 - val_loss: 0.0860 - val_accuracy: 0.9725
Epoch 3139/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1270 - accuracy:
0.9487 - val_loss: 0.1082 - val_accuracy: 0.9625
Epoch 3140/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1306 - accuracy:
0.9512 - val_loss: 0.1083 - val_accuracy: 0.9550
Epoch 3141/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1543 - accuracy:
0.9387 - val_loss: 0.1323 - val_accuracy: 0.9525
Epoch 3142/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1207 - accuracy:
0.9550 - val_loss: 0.0868 - val_accuracy: 0.9825
Epoch 3143/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1410 - accuracy:
0.9412 - val_loss: 0.0955 - val_accuracy: 0.9775
```

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Epoch 3144/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1226 - accuracy:
0.9562 - val_loss: 0.0846 - val_accuracy: 0.9700
Epoch 3145/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1228 - accuracy:
0.9581 - val_loss: 0.0964 - val_accuracy: 0.9700
Epoch 3146/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1345 - accuracy:
0.9450 - val_loss: 0.1931 - val_accuracy: 0.9100
Epoch 3147/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1876 - accuracy:
0.9206 - val_loss: 0.1446 - val_accuracy: 0.9550
Epoch 3148/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1449 - accuracy:
0.9400 - val_loss: 0.0939 - val_accuracy: 0.9625
Epoch 3149/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1417 - accuracy:
0.9387 - val_loss: 0.0974 - val_accuracy: 0.9675
Epoch 3150/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1303 - accuracy:
0.9481 - val_loss: 0.0815 - val_accuracy: 0.9875
Epoch 3151/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1401 - accuracy:
0.9456 - val_loss: 0.1801 - val_accuracy: 0.9225
Epoch 3152/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1834 - accuracy:
0.9193 - val_loss: 0.2205 - val_accuracy: 0.9150
Epoch 3153/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1678 - accuracy:
0.9268 - val_loss: 0.1419 - val_accuracy: 0.9575
Epoch 3154/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1506 - accuracy:
0.9337 - val_loss: 0.1638 - val_accuracy: 0.9275
Epoch 3155/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1532 - accuracy:
0.9306 - val_loss: 0.1676 - val_accuracy: 0.9175
Epoch 3156/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1634 - accuracy:
0.9300 - val_loss: 0.1178 - val_accuracy: 0.9725
Epoch 3157/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1278 - accuracy:
0.9506 - val_loss: 0.0818 - val_accuracy: 0.9800
Epoch 3158/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1204 - accuracy:
0.9568 - val_loss: 0.0861 - val_accuracy: 0.9725
Epoch 3159/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1256 - accuracy:
0.9581 - val_loss: 0.0863 - val_accuracy: 0.9775
```

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Epoch 3160/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1144 - accuracy:
0.9606 - val_loss: 0.0968 - val_accuracy: 0.9725
Epoch 3161/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1287 - accuracy:
0.9525 - val_loss: 0.0841 - val_accuracy: 0.9875
Epoch 3162/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1347 - accuracy:
0.9450 - val_loss: 0.1054 - val_accuracy: 0.9775
Epoch 3163/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1225 - accuracy:
0.9531 - val_loss: 0.0891 - val_accuracy: 0.9825
Epoch 3164/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1188 - accuracy:
0.9575 - val_loss: 0.0876 - val_accuracy: 0.9725
Epoch 3165/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1519 - accuracy:
0.9412 - val_loss: 0.1918 - val_accuracy: 0.9100
Epoch 3166/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1461 - accuracy:
0.9443 - val_loss: 0.1039 - val_accuracy: 0.9800
Epoch 3167/5000
13/13 [==============================] - 0s 18ms/step - loss: 0.1284 - accuracy:
0.9550 - val_loss: 0.0888 - val_accuracy: 0.9775
Epoch 3168/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1346 - accuracy:
0.9462 - val_loss: 0.0858 - val_accuracy: 0.9775
Epoch 3169/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1267 - accuracy:
0.9525 - val_loss: 0.0859 - val_accuracy: 0.9675
Epoch 3170/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1265 - accuracy:
0.9537 - val_loss: 0.0827 - val_accuracy: 0.9750
Epoch 3171/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1198 - accuracy:
0.9562 - val_loss: 0.0874 - val_accuracy: 0.9775
Epoch 3172/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1258 - accuracy:
0.9518 - val_loss: 0.1037 - val_accuracy: 0.9675
Epoch 3173/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1253 - accuracy:
0.9550 - val_loss: 0.1156 - val_accuracy: 0.9825
Epoch 3174/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1222 - accuracy:
0.9518 - val_loss: 0.1035 - val_accuracy: 0.9700
Epoch 3175/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1288 - accuracy:
0.9500 - val_loss: 0.1020 - val_accuracy: 0.9825
```

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Epoch 3176/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1222 - accuracy:
0.9481 - val_loss: 0.0863 - val_accuracy: 0.9825
Epoch 3177/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1243 - accuracy:
0.9481 - val_loss: 0.0877 - val_accuracy: 0.9875
Epoch 3178/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1307 - accuracy:
0.9512 - val_loss: 0.1094 - val_accuracy: 0.9625
Epoch 3179/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1246 - accuracy:
0.9543 - val_loss: 0.0951 - val_accuracy: 0.9775
Epoch 3180/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1175 - accuracy:
0.9575 - val_loss: 0.1003 - val_accuracy: 0.9825
Epoch 3181/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1190 - accuracy:
0.9556 - val_loss: 0.0964 - val_accuracy: 0.9725
Epoch 3182/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1326 - accuracy:
0.9537 - val_loss: 0.0933 - val_accuracy: 0.9675
Epoch 3183/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1228 - accuracy:
0.9525 - val_loss: 0.0884 - val_accuracy: 0.9800
Epoch 3184/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1344 - accuracy:
0.9475 - val_loss: 0.0904 - val_accuracy: 0.9725
Epoch 3185/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1244 - accuracy:
0.9525 - val_loss: 0.1279 - val_accuracy: 0.9425
Epoch 3186/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1314 - accuracy:
0.9525 - val_loss: 0.1032 - val_accuracy: 0.9700
Epoch 3187/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1278 - accuracy:
0.9581 - val_loss: 0.1670 - val_accuracy: 0.9575
Epoch 3188/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1485 - accuracy:
0.9481 - val_loss: 0.1052 - val_accuracy: 0.9600
Epoch 3189/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1372 - accuracy:
0.9437 - val_loss: 0.0914 - val_accuracy: 0.9550
Epoch 3190/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1305 - accuracy:
0.9525 - val_loss: 0.1118 - val_accuracy: 0.9650
Epoch 3191/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1580 - accuracy:
0.9375 - val_loss: 0.1483 - val_accuracy: 0.9350
```

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Epoch 3192/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1471 - accuracy:
0.9437 - val_loss: 0.1012 - val_accuracy: 0.9675
Epoch 3193/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1185 - accuracy:
0.9606 - val_loss: 0.0907 - val_accuracy: 0.9775
Epoch 3194/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1119 - accuracy:
0.9619 - val_loss: 0.0983 - val_accuracy: 0.9750
Epoch 3195/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1158 - accuracy:
0.9587 - val_loss: 0.0882 - val_accuracy: 0.9775
Epoch 3196/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1155 - accuracy:
0.9568 - val_loss: 0.1203 - val_accuracy: 0.9525
Epoch 3197/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1168 - accuracy:
0.9593 - val_loss: 0.1026 - val_accuracy: 0.9725
Epoch 3198/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1098 - accuracy:
0.9600 - val_loss: 0.0900 - val_accuracy: 0.9700
Epoch 3199/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1163 - accuracy:
0.9625 - val_loss: 0.1145 - val_accuracy: 0.9500
Epoch 3200/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1156 - accuracy:
0.9550 - val_loss: 0.0901 - val_accuracy: 0.9775
Epoch 3201/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1103 - accuracy:
0.9619 - val_loss: 0.1175 - val_accuracy: 0.9350
Epoch 3202/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1157 - accuracy:
0.9581 - val_loss: 0.0972 - val_accuracy: 0.9725
Epoch 3203/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1162 - accuracy:
0.9593 - val_loss: 0.1118 - val_accuracy: 0.9700
Epoch 3204/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1176 - accuracy:
0.9581 - val_loss: 0.0832 - val_accuracy: 0.9750
Epoch 3205/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1251 - accuracy:
0.9475 - val_loss: 0.1361 - val_accuracy: 0.9325
Epoch 3206/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1296 - accuracy:
0.9500 - val_loss: 0.1127 - val_accuracy: 0.9500
Epoch 3207/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1190 - accuracy:
0.9606 - val_loss: 0.1212 - val_accuracy: 0.9550
```

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Epoch 3208/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1404 - accuracy:
0.9418 - val_loss: 0.1058 - val_accuracy: 0.9850
Epoch 3209/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1264 - accuracy:
0.9500 - val_loss: 0.0781 - val_accuracy: 0.9850
Epoch 3210/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1362 - accuracy:
0.9500 - val_loss: 0.1015 - val_accuracy: 0.9825
Epoch 3211/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1296 - accuracy:
0.9493 - val_loss: 0.0881 - val_accuracy: 0.9700
Epoch 3212/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1446 - accuracy:
0.9493 - val_loss: 0.0881 - val_accuracy: 0.9700
Epoch 3213/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1436 - accuracy:
0.9387 - val_loss: 0.0917 - val_accuracy: 0.9750
Epoch 3214/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1137 - accuracy:
0.9600 - val_loss: 0.1113 - val_accuracy: 0.9650
Epoch 3215/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1118 - accuracy:
0.9562 - val_loss: 0.0946 - val_accuracy: 0.9775
Epoch 3216/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1170 - accuracy:
0.9600 - val_loss: 0.1286 - val_accuracy: 0.9400
Epoch 3217/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1363 - accuracy:
0.9468 - val_loss: 0.1151 - val_accuracy: 0.9625
Epoch 3218/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1130 - accuracy:
0.9612 - val_loss: 0.0818 - val_accuracy: 0.9875
Epoch 3219/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1154 - accuracy:
0.9550 - val_loss: 0.1039 - val_accuracy: 0.9775
Epoch 3220/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1114 - accuracy:
0.9587 - val_loss: 0.0836 - val_accuracy: 0.9750
Epoch 3221/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1261 - accuracy:
0.9581 - val_loss: 0.1277 - val_accuracy: 0.9575
Epoch 3222/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1402 - accuracy:
0.9431 - val_loss: 0.0827 - val_accuracy: 0.9775
Epoch 3223/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.2263 - accuracy:
0.9056 - val_loss: 0.1307 - val_accuracy: 0.9625
```

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Epoch 3224/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1949 - accuracy:
0.9231 - val_loss: 0.1426 - val_accuracy: 0.9575
Epoch 3225/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1276 - accuracy:
0.9512 - val_loss: 0.0913 - val_accuracy: 0.9750
Epoch 3226/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1252 - accuracy:
0.9537 - val_loss: 0.1269 - val_accuracy: 0.9350
Epoch 3227/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1335 - accuracy:
0.9456 - val_loss: 0.0830 - val_accuracy: 0.9850
Epoch 3228/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1558 - accuracy:
0.9300 - val_loss: 0.1780 - val_accuracy: 0.9275
Epoch 3229/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1627 - accuracy:
0.9331 - val_loss: 0.1142 - val_accuracy: 0.9750
Epoch 3230/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1586 - accuracy:
0.9412 - val_loss: 0.1155 - val_accuracy: 0.9525
Epoch 3231/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1204 - accuracy:
0.9575 - val_loss: 0.0978 - val_accuracy: 0.9675
Epoch 3232/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1142 - accuracy:
0.9637 - val_loss: 0.1097 - val_accuracy: 0.9550
Epoch 3233/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1230 - accuracy:
0.9531 - val_loss: 0.1130 - val_accuracy: 0.9750
Epoch 3234/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1393 - accuracy:
0.9475 - val_loss: 0.1125 - val_accuracy: 0.9550
Epoch 3235/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1520 - accuracy:
0.9325 - val_loss: 0.2006 - val_accuracy: 0.9000
Epoch 3236/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1432 - accuracy:
0.9487 - val_loss: 0.0921 - val_accuracy: 0.9800
Epoch 3237/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1302 - accuracy:
0.9443 - val_loss: 0.0957 - val_accuracy: 0.9825
Epoch 3238/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1169 - accuracy:
0.9587 - val_loss: 0.1094 - val_accuracy: 0.9625
Epoch 3239/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1203 - accuracy:
0.9556 - val_loss: 0.0922 - val_accuracy: 0.9825
```

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Epoch 3240/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1200 - accuracy:
0.9600 - val_loss: 0.1092 - val_accuracy: 0.9850
Epoch 3241/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1161 - accuracy:
0.9606 - val_loss: 0.1128 - val_accuracy: 0.9575
Epoch 3242/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1403 - accuracy:
0.9400 - val_loss: 0.1255 - val_accuracy: 0.9575
Epoch 3243/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1440 - accuracy:
0.9475 - val_loss: 0.0839 - val_accuracy: 0.9775
Epoch 3244/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1109 - accuracy:
0.9600 - val_loss: 0.1116 - val_accuracy: 0.9675
Epoch 3245/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1321 - accuracy:
0.9462 - val_loss: 0.1210 - val_accuracy: 0.9800
Epoch 3246/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1465 - accuracy:
0.9381 - val_loss: 0.1062 - val_accuracy: 0.9625
Epoch 3247/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1318 - accuracy:
0.9500 - val_loss: 0.1229 - val_accuracy: 0.9550
Epoch 3248/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1426 - accuracy:
0.9412 - val_loss: 0.1095 - val_accuracy: 0.9475
Epoch 3249/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1173 - accuracy:
0.9537 - val_loss: 0.0819 - val_accuracy: 0.9825
Epoch 3250/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1236 - accuracy:
0.9525 - val_loss: 0.0850 - val_accuracy: 0.9775
Epoch 3251/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1218 - accuracy:
0.9543 - val_loss: 0.0852 - val_accuracy: 0.9750
Epoch 3252/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1243 - accuracy:
0.9512 - val_loss: 0.0950 - val_accuracy: 0.9800
Epoch 3253/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1189 - accuracy:
0.9600 - val_loss: 0.0767 - val_accuracy: 0.9825
Epoch 3254/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1119 - accuracy:
0.9543 - val_loss: 0.1317 - val_accuracy: 0.9375
Epoch 3255/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1253 - accuracy:
0.9431 - val_loss: 0.1182 - val_accuracy: 0.9825
```

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Epoch 3256/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1301 - accuracy:
0.9556 - val_loss: 0.1544 - val_accuracy: 0.9400
Epoch 3257/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1562 - accuracy:
0.9431 - val_loss: 0.1046 - val_accuracy: 0.9675
Epoch 3258/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1406 - accuracy:
0.9425 - val_loss: 0.0957 - val_accuracy: 0.9575
Epoch 3259/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1195 - accuracy:
0.9600 - val_loss: 0.0921 - val_accuracy: 0.9750
Epoch 3260/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1172 - accuracy:
0.9606 - val_loss: 0.0947 - val_accuracy: 0.9750
Epoch 3261/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1203 - accuracy:
0.9537 - val_loss: 0.0922 - val_accuracy: 0.9725
Epoch 3262/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1173 - accuracy:
0.9575 - val_loss: 0.0853 - val_accuracy: 0.9775
Epoch 3263/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1197 - accuracy:
0.9550 - val_loss: 0.1258 - val_accuracy: 0.9550
Epoch 3264/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1305 - accuracy:
0.9481 - val_loss: 0.0794 - val_accuracy: 0.9775
Epoch 3265/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1214 - accuracy:
0.9537 - val_loss: 0.0780 - val_accuracy: 0.9800
Epoch 3266/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1163 - accuracy:
0.9593 - val_loss: 0.0946 - val_accuracy: 0.9750
Epoch 3267/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1132 - accuracy:
0.9593 - val_loss: 0.0875 - val_accuracy: 0.9675
Epoch 3268/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1300 - accuracy:
0.9531 - val_loss: 0.1342 - val_accuracy: 0.9500
Epoch 3269/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1624 - accuracy:
0.9243 - val_loss: 0.1203 - val_accuracy: 0.9500
Epoch 3270/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1320 - accuracy:
0.9487 - val_loss: 0.0922 - val_accuracy: 0.9800
Epoch 3271/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1150 - accuracy:
0.9581 - val_loss: 0.0878 - val_accuracy: 0.9775
```

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Epoch 3272/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1217 - accuracy:
0.9543 - val_loss: 0.0895 - val_accuracy: 0.9675
Epoch 3273/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1174 - accuracy:
0.9568 - val_loss: 0.1009 - val_accuracy: 0.9850
Epoch 3274/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1116 - accuracy:
0.9562 - val_loss: 0.1111 - val_accuracy: 0.9650
Epoch 3275/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1130 - accuracy:
0.9612 - val_loss: 0.0888 - val_accuracy: 0.9850
Epoch 3276/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1165 - accuracy:
0.9581 - val_loss: 0.0826 - val_accuracy: 0.9700
Epoch 3277/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1233 - accuracy:
0.9575 - val_loss: 0.1079 - val_accuracy: 0.9450
Epoch 3278/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1286 - accuracy:
0.9456 - val_loss: 0.0808 - val_accuracy: 0.9750
Epoch 3279/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1141 - accuracy:
0.9568 - val_loss: 0.0899 - val_accuracy: 0.9825
Epoch 3280/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1143 - accuracy:
0.9600 - val_loss: 0.0922 - val_accuracy: 0.9850
Epoch 3281/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1161 - accuracy:
0.9581 - val_loss: 0.1168 - val_accuracy: 0.9625
Epoch 3282/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1219 - accuracy:
0.9481 - val_loss: 0.1053 - val_accuracy: 0.9700
Epoch 3283/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1309 - accuracy:
0.9437 - val_loss: 0.1190 - val_accuracy: 0.9575
Epoch 3284/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1169 - accuracy:
0.9575 - val_loss: 0.0782 - val_accuracy: 0.9850
Epoch 3285/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1139 - accuracy:
0.9593 - val_loss: 0.0810 - val_accuracy: 0.9750
Epoch 3286/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1123 - accuracy:
0.9625 - val_loss: 0.0887 - val_accuracy: 0.9775
Epoch 3287/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1336 - accuracy:
0.9487 - val_loss: 0.0843 - val_accuracy: 0.9750
```

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Epoch 3288/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1572 - accuracy:
0.9318 - val_loss: 0.0818 - val_accuracy: 0.9800
Epoch 3289/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1309 - accuracy:
0.9506 - val_loss: 0.1260 - val_accuracy: 0.9625
Epoch 3290/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1441 - accuracy:
0.9493 - val_loss: 0.1131 - val_accuracy: 0.9550
Epoch 3291/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1234 - accuracy:
0.9493 - val_loss: 0.0885 - val_accuracy: 0.9775
Epoch 3292/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1240 - accuracy:
0.9512 - val_loss: 0.0941 - val_accuracy: 0.9725
Epoch 3293/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1298 - accuracy:
0.9425 - val_loss: 0.1041 - val_accuracy: 0.9750
Epoch 3294/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1247 - accuracy:
0.9531 - val_loss: 0.1013 - val_accuracy: 0.9850
Epoch 3295/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1247 - accuracy:
0.9531 - val_loss: 0.0848 - val_accuracy: 0.9750
Epoch 3296/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1121 - accuracy:
0.9600 - val_loss: 0.0811 - val_accuracy: 0.9800
Epoch 3297/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1099 - accuracy:
0.9644 - val_loss: 0.0845 - val_accuracy: 0.9775
Epoch 3298/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1115 - accuracy:
0.9575 - val_loss: 0.0767 - val_accuracy: 0.9775
Epoch 3299/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1209 - accuracy:
0.9525 - val_loss: 0.1000 - val_accuracy: 0.9650
Epoch 3300/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1182 - accuracy:
0.9556 - val_loss: 0.1137 - val_accuracy: 0.9725
Epoch 3301/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1242 - accuracy:
0.9512 - val_loss: 0.1374 - val_accuracy: 0.9475
Epoch 3302/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1586 - accuracy:
0.9362 - val_loss: 0.1679 - val_accuracy: 0.9400
Epoch 3303/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1514 - accuracy:
0.9431 - val_loss: 0.0925 - val_accuracy: 0.9800
```

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Epoch 3304/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1228 - accuracy:
0.9562 - val_loss: 0.0948 - val_accuracy: 0.9850
Epoch 3305/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1228 - accuracy:
0.9581 - val_loss: 0.1288 - val_accuracy: 0.9575
Epoch 3306/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1268 - accuracy:
0.9556 - val_loss: 0.0962 - val_accuracy: 0.9775
Epoch 3307/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1272 - accuracy:
0.9525 - val_loss: 0.0859 - val_accuracy: 0.9825
Epoch 3308/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1204 - accuracy:
0.9531 - val_loss: 0.1048 - val_accuracy: 0.9625
Epoch 3309/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1315 - accuracy:
0.9468 - val_loss: 0.1062 - val_accuracy: 0.9825
Epoch 3310/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1174 - accuracy:
0.9537 - val_loss: 0.1519 - val_accuracy: 0.9375
Epoch 3311/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1577 - accuracy:
0.9337 - val_loss: 0.1618 - val_accuracy: 0.9400
Epoch 3312/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1335 - accuracy:
0.9500 - val_loss: 0.0899 - val_accuracy: 0.9725
Epoch 3313/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.2496 - accuracy:
0.9112 - val_loss: 0.1845 - val_accuracy: 0.9425
Epoch 3314/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.2507 - accuracy:
0.8993 - val_loss: 0.1994 - val_accuracy: 0.9400
Epoch 3315/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.2091 - accuracy:
0.9225 - val_loss: 0.1237 - val_accuracy: 0.9550
Epoch 3316/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1485 - accuracy:
0.9387 - val_loss: 0.0925 - val_accuracy: 0.9750
Epoch 3317/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1301 - accuracy:
0.9487 - val_loss: 0.0968 - val_accuracy: 0.9750
Epoch 3318/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1289 - accuracy:
0.9481 - val_loss: 0.1034 - val_accuracy: 0.9675
Epoch 3319/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1193 - accuracy:
0.9556 - val_loss: 0.1259 - val_accuracy: 0.9400
```

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Epoch 3320/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1251 - accuracy:
0.9500 - val_loss: 0.1122 - val_accuracy: 0.9775
Epoch 3321/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1511 - accuracy:
0.9381 - val_loss: 0.1051 - val_accuracy: 0.9550
Epoch 3322/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1445 - accuracy:
0.9400 - val_loss: 0.1260 - val_accuracy: 0.9575
Epoch 3323/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1465 - accuracy:
0.9406 - val_loss: 0.1082 - val_accuracy: 0.9575
Epoch 3324/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1409 - accuracy:
0.9512 - val_loss: 0.0879 - val_accuracy: 0.9675
Epoch 3325/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1222 - accuracy:
0.9606 - val_loss: 0.0922 - val_accuracy: 0.9825
Epoch 3326/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1112 - accuracy:
0.9593 - val_loss: 0.1257 - val_accuracy: 0.9725
Epoch 3327/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1221 - accuracy:
0.9537 - val_loss: 0.0872 - val_accuracy: 0.9825
Epoch 3328/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1086 - accuracy:
0.9650 - val_loss: 0.0900 - val_accuracy: 0.9775
Epoch 3329/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1106 - accuracy:
0.9606 - val_loss: 0.0848 - val_accuracy: 0.9850
Epoch 3330/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1251 - accuracy:
0.9518 - val_loss: 0.1279 - val_accuracy: 0.9450
Epoch 3331/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1308 - accuracy:
0.9462 - val_loss: 0.0857 - val_accuracy: 0.9725
Epoch 3332/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1320 - accuracy:
0.9512 - val_loss: 0.0893 - val_accuracy: 0.9725
Epoch 3333/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1191 - accuracy:
0.9550 - val_loss: 0.0911 - val_accuracy: 0.9750
Epoch 3334/5000
13/13 [==============================] - 0s 17ms/step - loss: 0.1175 - accuracy:
0.9593 - val_loss: 0.1111 - val_accuracy: 0.9725
Epoch 3335/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1122 - accuracy:
0.9606 - val_loss: 0.0861 - val_accuracy: 0.9875
```

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Epoch 3336/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1151 - accuracy:
0.9575 - val_loss: 0.0810 - val_accuracy: 0.9825
Epoch 3337/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1181 - accuracy:
0.9462 - val_loss: 0.1068 - val_accuracy: 0.9550
Epoch 3338/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1268 - accuracy:
0.9568 - val_loss: 0.0980 - val_accuracy: 0.9700
Epoch 3339/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1176 - accuracy:
0.9550 - val_loss: 0.1207 - val_accuracy: 0.9650
Epoch 3340/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1356 - accuracy:
0.9481 - val_loss: 0.1016 - val_accuracy: 0.9725
Epoch 3341/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1179 - accuracy:
0.9575 - val_loss: 0.1056 - val_accuracy: 0.9600
Epoch 3342/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1132 - accuracy:
0.9606 - val_loss: 0.0834 - val_accuracy: 0.9850
Epoch 3343/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1145 - accuracy:
0.9631 - val_loss: 0.1123 - val_accuracy: 0.9600
Epoch 3344/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1104 - accuracy:
0.9568 - val_loss: 0.0905 - val_accuracy: 0.9850
Epoch 3345/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1200 - accuracy:
0.9550 - val_loss: 0.0934 - val_accuracy: 0.9700
Epoch 3346/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1388 - accuracy:
0.9468 - val_loss: 0.1264 - val_accuracy: 0.9500
Epoch 3347/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1418 - accuracy:
0.9381 - val_loss: 0.0875 - val_accuracy: 0.9775
Epoch 3348/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1178 - accuracy:
0.9525 - val_loss: 0.0834 - val_accuracy: 0.9750
Epoch 3349/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1202 - accuracy:
0.9537 - val_loss: 0.1028 - val_accuracy: 0.9800
Epoch 3350/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1168 - accuracy:
0.9537 - val_loss: 0.0798 - val_accuracy: 0.9775
Epoch 3351/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1151 - accuracy:
0.9612 - val_loss: 0.0825 - val_accuracy: 0.9750
```

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Epoch 3352/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1280 - accuracy:
0.9437 - val_loss: 0.1118 - val_accuracy: 0.9550
Epoch 3353/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1197 - accuracy:
0.9600 - val_loss: 0.0965 - val_accuracy: 0.9825
Epoch 3354/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1198 - accuracy:
0.9525 - val_loss: 0.0853 - val_accuracy: 0.9825
Epoch 3355/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1152 - accuracy:
0.9587 - val_loss: 0.0764 - val_accuracy: 0.9850
Epoch 3356/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1159 - accuracy:
0.9625 - val_loss: 0.1017 - val_accuracy: 0.9725
Epoch 3357/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1258 - accuracy:
0.9556 - val_loss: 0.0926 - val_accuracy: 0.9700
Epoch 3358/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1161 - accuracy:
0.9612 - val_loss: 0.0915 - val_accuracy: 0.9750
Epoch 3359/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1176 - accuracy:
0.9550 - val_loss: 0.1021 - val_accuracy: 0.9825
Epoch 3360/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1179 - accuracy:
0.9600 - val_loss: 0.0831 - val_accuracy: 0.9700
Epoch 3361/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1175 - accuracy:
0.9525 - val_loss: 0.0921 - val_accuracy: 0.9675
Epoch 3362/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1163 - accuracy:
0.9587 - val_loss: 0.0881 - val_accuracy: 0.9825
Epoch 3363/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1185 - accuracy:
0.9537 - val_loss: 0.1304 - val_accuracy: 0.9550
Epoch 3364/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1458 - accuracy:
0.9387 - val_loss: 0.0980 - val_accuracy: 0.9625
Epoch 3365/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1623 - accuracy:
0.9337 - val_loss: 0.0866 - val_accuracy: 0.9750
Epoch 3366/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1305 - accuracy:
0.9556 - val_loss: 0.0937 - val_accuracy: 0.9750
Epoch 3367/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1175 - accuracy:
0.9556 - val_loss: 0.0893 - val_accuracy: 0.9700
```

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Epoch 3368/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1151 - accuracy:
0.9568 - val_loss: 0.0906 - val_accuracy: 0.9750
Epoch 3369/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1282 - accuracy:
0.9537 - val_loss: 0.0807 - val_accuracy: 0.9750
Epoch 3370/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1137 - accuracy:
0.9619 - val_loss: 0.0838 - val_accuracy: 0.9800
Epoch 3371/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1260 - accuracy:
0.9512 - val_loss: 0.0784 - val_accuracy: 0.9775
Epoch 3372/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1112 - accuracy:
0.9600 - val_loss: 0.0842 - val_accuracy: 0.9725
Epoch 3373/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1112 - accuracy:
0.9593 - val_loss: 0.0896 - val_accuracy: 0.9700
Epoch 3374/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1102 - accuracy:
0.9612 - val_loss: 0.1057 - val_accuracy: 0.9625
Epoch 3375/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1124 - accuracy:
0.9612 - val_loss: 0.1528 - val_accuracy: 0.9475
Epoch 3376/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1408 - accuracy:
0.9431 - val_loss: 0.1151 - val_accuracy: 0.9525
Epoch 3377/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1253 - accuracy:
0.9568 - val_loss: 0.0822 - val_accuracy: 0.9750
Epoch 3378/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1335 - accuracy:
0.9525 - val_loss: 0.0859 - val_accuracy: 0.9750
Epoch 3379/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1316 - accuracy:
0.9475 - val_loss: 0.0863 - val_accuracy: 0.9800
Epoch 3380/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1195 - accuracy:
0.9568 - val_loss: 0.0865 - val_accuracy: 0.9800
Epoch 3381/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1199 - accuracy:
0.9525 - val_loss: 0.1628 - val_accuracy: 0.9175
Epoch 3382/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1394 - accuracy:
0.9381 - val_loss: 0.1081 - val_accuracy: 0.9675
Epoch 3383/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1292 - accuracy:
0.9506 - val_loss: 0.1390 - val_accuracy: 0.9675
```

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Epoch 3384/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1251 - accuracy:
0.9543 - val_loss: 0.0940 - val_accuracy: 0.9800
Epoch 3385/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1192 - accuracy:
0.9612 - val_loss: 0.1028 - val_accuracy: 0.9725
Epoch 3386/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1912 - accuracy:
0.9212 - val_loss: 0.2718 - val_accuracy: 0.9000
Epoch 3387/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1921 - accuracy:
0.9212 - val_loss: 0.2917 - val_accuracy: 0.8825
Epoch 3388/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.2368 - accuracy:
0.9087 - val_loss: 0.2419 - val_accuracy: 0.8900
Epoch 3389/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.2217 - accuracy:
0.9024 - val_loss: 0.2865 - val_accuracy: 0.8950
Epoch 3390/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2000 - accuracy:
0.9243 - val_loss: 0.1196 - val_accuracy: 0.9650
Epoch 3391/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1536 - accuracy:
0.9362 - val_loss: 0.1407 - val_accuracy: 0.9675
Epoch 3392/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1246 - accuracy:
0.9568 - val_loss: 0.0904 - val_accuracy: 0.9750
Epoch 3393/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1213 - accuracy:
0.9556 - val_loss: 0.0931 - val_accuracy: 0.9850
Epoch 3394/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1210 - accuracy:
0.9556 - val_loss: 0.0977 - val_accuracy: 0.9675
Epoch 3395/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1130 - accuracy:
0.9619 - val_loss: 0.0976 - val_accuracy: 0.9725
Epoch 3396/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1159 - accuracy:
0.9606 - val_loss: 0.0889 - val_accuracy: 0.9875
Epoch 3397/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1089 - accuracy:
0.9619 - val_loss: 0.0846 - val_accuracy: 0.9750
Epoch 3398/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1189 - accuracy:
0.9556 - val_loss: 0.0794 - val_accuracy: 0.9800
Epoch 3399/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1202 - accuracy:
0.9525 - val_loss: 0.0824 - val_accuracy: 0.9875
```

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Epoch 3400/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1252 - accuracy:
0.9518 - val_loss: 0.1314 - val_accuracy: 0.9375
Epoch 3401/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1345 - accuracy:
0.9468 - val_loss: 0.1029 - val_accuracy: 0.9775
Epoch 3402/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1199 - accuracy:
0.9593 - val_loss: 0.0911 - val_accuracy: 0.9775
Epoch 3403/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1201 - accuracy:
0.9587 - val_loss: 0.0829 - val_accuracy: 0.9800
Epoch 3404/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1335 - accuracy:
0.9431 - val_loss: 0.1125 - val_accuracy: 0.9550
Epoch 3405/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1271 - accuracy:
0.9525 - val_loss: 0.0933 - val_accuracy: 0.9725
Epoch 3406/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1308 - accuracy:
0.9537 - val_loss: 0.1075 - val_accuracy: 0.9550
Epoch 3407/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1307 - accuracy:
0.9500 - val_loss: 0.2454 - val_accuracy: 0.8975
Epoch 3408/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1520 - accuracy:
0.9406 - val_loss: 0.0929 - val_accuracy: 0.9600
Epoch 3409/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1334 - accuracy:
0.9462 - val_loss: 0.1015 - val_accuracy: 0.9600
Epoch 3410/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1312 - accuracy:
0.9462 - val_loss: 0.0965 - val_accuracy: 0.9825
Epoch 3411/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1171 - accuracy:
0.9593 - val_loss: 0.0778 - val_accuracy: 0.9800
Epoch 3412/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1108 - accuracy:
0.9619 - val_loss: 0.0781 - val_accuracy: 0.9900
Epoch 3413/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1139 - accuracy:
0.9593 - val_loss: 0.0983 - val_accuracy: 0.9600
Epoch 3414/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1262 - accuracy:
0.9443 - val_loss: 0.0838 - val_accuracy: 0.9750
Epoch 3415/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1112 - accuracy:
0.9556 - val_loss: 0.0749 - val_accuracy: 0.9825
```

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Epoch 3416/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1178 - accuracy:
0.9568 - val_loss: 0.1026 - val_accuracy: 0.9600
Epoch 3417/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1070 - accuracy:
0.9619 - val_loss: 0.0872 - val_accuracy: 0.9825
Epoch 3418/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1229 - accuracy:
0.9537 - val_loss: 0.0852 - val_accuracy: 0.9875
Epoch 3419/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1222 - accuracy:
0.9543 - val_loss: 0.0894 - val_accuracy: 0.9875
Epoch 3420/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1151 - accuracy:
0.9593 - val_loss: 0.0977 - val_accuracy: 0.9675
Epoch 3421/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1128 - accuracy:
0.9631 - val_loss: 0.0863 - val_accuracy: 0.9725
Epoch 3422/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1118 - accuracy:
0.9575 - val_loss: 0.0877 - val_accuracy: 0.9775
Epoch 3423/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1138 - accuracy:
0.9556 - val_loss: 0.0813 - val_accuracy: 0.9875
Epoch 3424/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1075 - accuracy:
0.9644 - val_loss: 0.0908 - val_accuracy: 0.9700
Epoch 3425/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1097 - accuracy:
0.9575 - val_loss: 0.0818 - val_accuracy: 0.9875
Epoch 3426/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1140 - accuracy:
0.9600 - val_loss: 0.1361 - val_accuracy: 0.9700
Epoch 3427/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1221 - accuracy:
0.9556 - val_loss: 0.1009 - val_accuracy: 0.9675
Epoch 3428/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1263 - accuracy:
0.9475 - val_loss: 0.1157 - val_accuracy: 0.9600
Epoch 3429/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1227 - accuracy:
0.9543 - val_loss: 0.0927 - val_accuracy: 0.9700
Epoch 3430/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1349 - accuracy:
0.9450 - val_loss: 0.1419 - val_accuracy: 0.9250
Epoch 3431/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1594 - accuracy:
0.9362 - val_loss: 0.0907 - val_accuracy: 0.9750
```

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Epoch 3432/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1380 - accuracy:
0.9368 - val_loss: 0.1541 - val_accuracy: 0.9450
Epoch 3433/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1351 - accuracy:
0.9418 - val_loss: 0.1308 - val_accuracy: 0.9500
Epoch 3434/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1325 - accuracy:
0.9468 - val_loss: 0.0843 - val_accuracy: 0.9875
Epoch 3435/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1144 - accuracy:
0.9612 - val_loss: 0.0884 - val_accuracy: 0.9725
Epoch 3436/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1153 - accuracy:
0.9587 - val_loss: 0.1014 - val_accuracy: 0.9650
Epoch 3437/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1331 - accuracy:
0.9450 - val_loss: 0.0946 - val_accuracy: 0.9700
Epoch 3438/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1219 - accuracy:
0.9568 - val_loss: 0.1288 - val_accuracy: 0.9600
Epoch 3439/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1109 - accuracy:
0.9612 - val_loss: 0.0867 - val_accuracy: 0.9800
Epoch 3440/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1060 - accuracy:
0.9593 - val_loss: 0.0785 - val_accuracy: 0.9850
Epoch 3441/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1123 - accuracy:
0.9606 - val_loss: 0.0893 - val_accuracy: 0.9850
Epoch 3442/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1087 - accuracy:
0.9669 - val_loss: 0.0831 - val_accuracy: 0.9775
Epoch 3443/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1197 - accuracy:
0.9518 - val_loss: 0.1129 - val_accuracy: 0.9550
Epoch 3444/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1265 - accuracy:
0.9487 - val_loss: 0.0776 - val_accuracy: 0.9800
Epoch 3445/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1231 - accuracy:
0.9525 - val_loss: 0.1156 - val_accuracy: 0.9775
Epoch 3446/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1206 - accuracy:
0.9587 - val_loss: 0.1254 - val_accuracy: 0.9550
Epoch 3447/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1149 - accuracy:
0.9575 - val_loss: 0.0757 - val_accuracy: 0.9775
```

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Epoch 3448/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1279 - accuracy:
0.9525 - val_loss: 0.0848 - val_accuracy: 0.9775
Epoch 3449/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1189 - accuracy:
0.9556 - val_loss: 0.1018 - val_accuracy: 0.9750
Epoch 3450/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1255 - accuracy:
0.9493 - val_loss: 0.0919 - val_accuracy: 0.9750
Epoch 3451/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1307 - accuracy:
0.9456 - val_loss: 0.1110 - val_accuracy: 0.9600
Epoch 3452/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1240 - accuracy:
0.9518 - val_loss: 0.0855 - val_accuracy: 0.9775
Epoch 3453/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1505 - accuracy:
0.9462 - val_loss: 0.0942 - val_accuracy: 0.9800
Epoch 3454/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1589 - accuracy:
0.9450 - val_loss: 0.1091 - val_accuracy: 0.9575
Epoch 3455/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1320 - accuracy:
0.9406 - val_loss: 0.0969 - val_accuracy: 0.9650
Epoch 3456/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1214 - accuracy:
0.9593 - val_loss: 0.0820 - val_accuracy: 0.9850
Epoch 3457/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1077 - accuracy:
0.9625 - val_loss: 0.1456 - val_accuracy: 0.9425
Epoch 3458/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1314 - accuracy:
0.9500 - val_loss: 0.0939 - val_accuracy: 0.9875
Epoch 3459/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1211 - accuracy:
0.9537 - val_loss: 0.1071 - val_accuracy: 0.9725
Epoch 3460/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1169 - accuracy:
0.9581 - val_loss: 0.0831 - val_accuracy: 0.9725
Epoch 3461/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1110 - accuracy:
0.9619 - val_loss: 0.0818 - val_accuracy: 0.9775
Epoch 3462/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1146 - accuracy:
0.9562 - val_loss: 0.0749 - val_accuracy: 0.9750
Epoch 3463/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1095 - accuracy:
0.9606 - val_loss: 0.0910 - val_accuracy: 0.9675
```

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Epoch 3464/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1105 - accuracy:
0.9593 - val_loss: 0.0696 - val_accuracy: 0.9800
Epoch 3465/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1138 - accuracy:
0.9575 - val_loss: 0.0808 - val_accuracy: 0.9825
Epoch 3466/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1210 - accuracy:
0.9506 - val_loss: 0.0965 - val_accuracy: 0.9650
Epoch 3467/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1214 - accuracy:
0.9475 - val_loss: 0.0874 - val_accuracy: 0.9850
Epoch 3468/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1173 - accuracy:
0.9556 - val_loss: 0.0903 - val_accuracy: 0.9725
Epoch 3469/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1187 - accuracy:
0.9525 - val_loss: 0.1113 - val_accuracy: 0.9575
Epoch 3470/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1403 - accuracy:
0.9443 - val_loss: 0.1439 - val_accuracy: 0.9400
Epoch 3471/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1147 - accuracy:
0.9593 - val_loss: 0.0903 - val_accuracy: 0.9750
Epoch 3472/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1148 - accuracy:
0.9575 - val_loss: 0.1015 - val_accuracy: 0.9625
Epoch 3473/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1191 - accuracy:
0.9537 - val_loss: 0.0816 - val_accuracy: 0.9750
Epoch 3474/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1150 - accuracy:
0.9593 - val_loss: 0.0974 - val_accuracy: 0.9825
Epoch 3475/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1305 - accuracy:
0.9462 - val_loss: 0.0883 - val_accuracy: 0.9750
Epoch 3476/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1351 - accuracy:
0.9506 - val_loss: 0.0828 - val_accuracy: 0.9825
Epoch 3477/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1281 - accuracy:
0.9500 - val_loss: 0.1195 - val_accuracy: 0.9550
Epoch 3478/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1376 - accuracy:
0.9506 - val_loss: 0.1171 - val_accuracy: 0.9600
Epoch 3479/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1629 - accuracy:
0.9306 - val_loss: 0.0897 - val_accuracy: 0.9700
```

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Epoch 3480/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1235 - accuracy:
0.9518 - val_loss: 0.0853 - val_accuracy: 0.9750
Epoch 3481/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1155 - accuracy:
0.9575 - val_loss: 0.0873 - val_accuracy: 0.9875
Epoch 3482/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1157 - accuracy:
0.9562 - val_loss: 0.1015 - val_accuracy: 0.9525
Epoch 3483/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1100 - accuracy:
0.9612 - val_loss: 0.1052 - val_accuracy: 0.9825
Epoch 3484/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1203 - accuracy:
0.9575 - val_loss: 0.0948 - val_accuracy: 0.9650
Epoch 3485/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1097 - accuracy:
0.9637 - val_loss: 0.0806 - val_accuracy: 0.9750
Epoch 3486/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1265 - accuracy:
0.9500 - val_loss: 0.0898 - val_accuracy: 0.9875
Epoch 3487/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1098 - accuracy:
0.9625 - val_loss: 0.0982 - val_accuracy: 0.9825
Epoch 3488/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1182 - accuracy:
0.9550 - val_loss: 0.1049 - val_accuracy: 0.9625
Epoch 3489/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1233 - accuracy:
0.9525 - val_loss: 0.0933 - val_accuracy: 0.9825
Epoch 3490/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1089 - accuracy:
0.9587 - val_loss: 0.1139 - val_accuracy: 0.9400
Epoch 3491/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1152 - accuracy:
0.9593 - val_loss: 0.0711 - val_accuracy: 0.9825
Epoch 3492/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1147 - accuracy:
0.9568 - val_loss: 0.0938 - val_accuracy: 0.9675
Epoch 3493/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1130 - accuracy:
0.9562 - val_loss: 0.1029 - val_accuracy: 0.9600
Epoch 3494/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1191 - accuracy:
0.9531 - val_loss: 0.0739 - val_accuracy: 0.9850
Epoch 3495/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1134 - accuracy:
0.9612 - val_loss: 0.1090 - val_accuracy: 0.9800
```

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Epoch 3496/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1087 - accuracy:
0.9612 - val_loss: 0.0808 - val_accuracy: 0.9800
Epoch 3497/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1119 - accuracy:
0.9606 - val_loss: 0.0903 - val_accuracy: 0.9650
Epoch 3498/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1195 - accuracy:
0.9543 - val_loss: 0.0922 - val_accuracy: 0.9775
Epoch 3499/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1121 - accuracy:
0.9575 - val_loss: 0.1680 - val_accuracy: 0.9575
Epoch 3500/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1443 - accuracy:
0.9412 - val_loss: 0.1130 - val_accuracy: 0.9625
Epoch 3501/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1294 - accuracy:
0.9475 - val_loss: 0.1271 - val_accuracy: 0.9600
Epoch 3502/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1109 - accuracy:
0.9606 - val_loss: 0.0907 - val_accuracy: 0.9725
Epoch 3503/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1312 - accuracy:
0.9412 - val_loss: 0.1187 - val_accuracy: 0.9625
Epoch 3504/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1500 - accuracy:
0.9350 - val_loss: 0.0738 - val_accuracy: 0.9800
Epoch 3505/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1288 - accuracy:
0.9531 - val_loss: 0.1070 - val_accuracy: 0.9750
Epoch 3506/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1327 - accuracy:
0.9550 - val_loss: 0.0932 - val_accuracy: 0.9850
Epoch 3507/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1458 - accuracy:
0.9375 - val_loss: 0.0985 - val_accuracy: 0.9750
Epoch 3508/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1871 - accuracy:
0.9306 - val_loss: 0.1143 - val_accuracy: 0.9675
Epoch 3509/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1568 - accuracy:
0.9381 - val_loss: 0.1254 - val_accuracy: 0.9575
Epoch 3510/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1298 - accuracy:
0.9537 - val_loss: 0.1070 - val_accuracy: 0.9575
Epoch 3511/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1197 - accuracy:
0.9525 - val_loss: 0.0826 - val_accuracy: 0.9700
```

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Epoch 3512/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1155 - accuracy:
0.9593 - val_loss: 0.0954 - val_accuracy: 0.9625
Epoch 3513/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1201 - accuracy:
0.9537 - val_loss: 0.0862 - val_accuracy: 0.9825
Epoch 3514/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1116 - accuracy:
0.9644 - val_loss: 0.0913 - val_accuracy: 0.9675
Epoch 3515/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1157 - accuracy:
0.9575 - val_loss: 0.1469 - val_accuracy: 0.9450
Epoch 3516/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1370 - accuracy:
0.9456 - val_loss: 0.1546 - val_accuracy: 0.9525
Epoch 3517/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1697 - accuracy:
0.9331 - val_loss: 0.2651 - val_accuracy: 0.8775
Epoch 3518/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1703 - accuracy:
0.9325 - val_loss: 0.0799 - val_accuracy: 0.9725
Epoch 3519/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1331 - accuracy:
0.9525 - val_loss: 0.0876 - val_accuracy: 0.9700
Epoch 3520/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1303 - accuracy:
0.9493 - val_loss: 0.0993 - val_accuracy: 0.9675
Epoch 3521/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1178 - accuracy:
0.9581 - val_loss: 0.1079 - val_accuracy: 0.9675
Epoch 3522/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1189 - accuracy:
0.9600 - val_loss: 0.0816 - val_accuracy: 0.9675
Epoch 3523/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1199 - accuracy:
0.9531 - val_loss: 0.1087 - val_accuracy: 0.9750
Epoch 3524/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1201 - accuracy:
0.9600 - val_loss: 0.1064 - val_accuracy: 0.9525
Epoch 3525/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1230 - accuracy:
0.9550 - val_loss: 0.0825 - val_accuracy: 0.9875
Epoch 3526/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1133 - accuracy:
0.9556 - val_loss: 0.0924 - val_accuracy: 0.9750
Epoch 3527/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1100 - accuracy:
0.9600 - val_loss: 0.0794 - val_accuracy: 0.9875
```

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Epoch 3528/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1178 - accuracy:
0.9562 - val_loss: 0.0983 - val_accuracy: 0.9625
Epoch 3529/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1223 - accuracy:
0.9543 - val_loss: 0.0939 - val_accuracy: 0.9725
Epoch 3530/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1092 - accuracy:
0.9562 - val_loss: 0.0878 - val_accuracy: 0.9750
Epoch 3531/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1224 - accuracy:
0.9568 - val_loss: 0.1048 - val_accuracy: 0.9675
Epoch 3532/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1098 - accuracy:
0.9606 - val_loss: 0.1186 - val_accuracy: 0.9525
Epoch 3533/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1121 - accuracy:
0.9593 - val_loss: 0.0983 - val_accuracy: 0.9625
Epoch 3534/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1143 - accuracy:
0.9600 - val_loss: 0.1022 - val_accuracy: 0.9575
Epoch 3535/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1208 - accuracy:
0.9537 - val_loss: 0.0961 - val_accuracy: 0.9675
Epoch 3536/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1256 - accuracy:
0.9525 - val_loss: 0.0790 - val_accuracy: 0.9800
Epoch 3537/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1170 - accuracy:
0.9568 - val_loss: 0.0865 - val_accuracy: 0.9850
Epoch 3538/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1112 - accuracy:
0.9606 - val_loss: 0.0793 - val_accuracy: 0.9825
Epoch 3539/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1070 - accuracy:
0.9631 - val_loss: 0.0769 - val_accuracy: 0.9775
Epoch 3540/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1043 - accuracy:
0.9631 - val_loss: 0.0945 - val_accuracy: 0.9600
Epoch 3541/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1266 - accuracy:
0.9518 - val_loss: 0.0873 - val_accuracy: 0.9700
Epoch 3542/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1216 - accuracy:
0.9575 - val_loss: 0.1894 - val_accuracy: 0.9125
Epoch 3543/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1368 - accuracy:
0.9418 - val_loss: 0.0889 - val_accuracy: 0.9750
```

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Epoch 3544/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1139 - accuracy:
0.9606 - val_loss: 0.0981 - val_accuracy: 0.9675
Epoch 3545/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1221 - accuracy:
0.9575 - val_loss: 0.0978 - val_accuracy: 0.9550
Epoch 3546/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1180 - accuracy:
0.9581 - val_loss: 0.0771 - val_accuracy: 0.9850
Epoch 3547/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1142 - accuracy:
0.9612 - val_loss: 0.0889 - val_accuracy: 0.9650
Epoch 3548/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1106 - accuracy:
0.9593 - val_loss: 0.0739 - val_accuracy: 0.9875
Epoch 3549/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1108 - accuracy:
0.9625 - val_loss: 0.0962 - val_accuracy: 0.9725
Epoch 3550/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1297 - accuracy:
0.9487 - val_loss: 0.0890 - val_accuracy: 0.9725
Epoch 3551/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1311 - accuracy:
0.9506 - val_loss: 0.1501 - val_accuracy: 0.9450
Epoch 3552/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1423 - accuracy:
0.9462 - val_loss: 0.0911 - val_accuracy: 0.9750
Epoch 3553/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1143 - accuracy:
0.9543 - val_loss: 0.1064 - val_accuracy: 0.9700
Epoch 3554/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1070 - accuracy:
0.9631 - val_loss: 0.0793 - val_accuracy: 0.9750
Epoch 3555/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1182 - accuracy:
0.9556 - val_loss: 0.1025 - val_accuracy: 0.9650
Epoch 3556/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1229 - accuracy:
0.9581 - val_loss: 0.1024 - val_accuracy: 0.9825
Epoch 3557/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1181 - accuracy:
0.9531 - val_loss: 0.0870 - val_accuracy: 0.9750
Epoch 3558/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1056 - accuracy:
0.9625 - val_loss: 0.1127 - val_accuracy: 0.9400
Epoch 3559/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1264 - accuracy:
0.9518 - val_loss: 0.1762 - val_accuracy: 0.9100
```

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Epoch 3560/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1264 - accuracy:
0.9487 - val_loss: 0.1033 - val_accuracy: 0.9650
Epoch 3561/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1225 - accuracy:
0.9525 - val_loss: 0.1197 - val_accuracy: 0.9725
Epoch 3562/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1294 - accuracy:
0.9543 - val_loss: 0.1053 - val_accuracy: 0.9575
Epoch 3563/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1294 - accuracy:
0.9518 - val_loss: 0.0812 - val_accuracy: 0.9875
Epoch 3564/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1427 - accuracy:
0.9468 - val_loss: 0.0933 - val_accuracy: 0.9675
Epoch 3565/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1251 - accuracy:
0.9487 - val_loss: 0.0904 - val_accuracy: 0.9750
Epoch 3566/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1148 - accuracy:
0.9587 - val_loss: 0.0994 - val_accuracy: 0.9750
Epoch 3567/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1177 - accuracy:
0.9543 - val_loss: 0.0839 - val_accuracy: 0.9725
Epoch 3568/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1164 - accuracy:
0.9575 - val_loss: 0.0732 - val_accuracy: 0.9800
Epoch 3569/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1251 - accuracy:
0.9543 - val_loss: 0.1227 - val_accuracy: 0.9775
Epoch 3570/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1598 - accuracy:
0.9318 - val_loss: 0.1412 - val_accuracy: 0.9250
Epoch 3571/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1433 - accuracy:
0.9450 - val_loss: 0.0862 - val_accuracy: 0.9725
Epoch 3572/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1121 - accuracy:
0.9575 - val_loss: 0.0921 - val_accuracy: 0.9700
Epoch 3573/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1200 - accuracy:
0.9525 - val_loss: 0.1074 - val_accuracy: 0.9525
Epoch 3574/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1131 - accuracy:
0.9581 - val_loss: 0.1039 - val_accuracy: 0.9725
Epoch 3575/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1096 - accuracy:
0.9625 - val_loss: 0.0880 - val_accuracy: 0.9775
```

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Epoch 3576/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1094 - accuracy:
0.9587 - val_loss: 0.1040 - val_accuracy: 0.9650
Epoch 3577/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1224 - accuracy:
0.9543 - val_loss: 0.1000 - val_accuracy: 0.9800
Epoch 3578/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1262 - accuracy:
0.9431 - val_loss: 0.1122 - val_accuracy: 0.9750
Epoch 3579/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1231 - accuracy:
0.9562 - val_loss: 0.0834 - val_accuracy: 0.9775
Epoch 3580/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1171 - accuracy:
0.9543 - val_loss: 0.0877 - val_accuracy: 0.9700
Epoch 3581/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1176 - accuracy:
0.9550 - val_loss: 0.0814 - val_accuracy: 0.9825
Epoch 3582/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1145 - accuracy:
0.9606 - val_loss: 0.0861 - val_accuracy: 0.9875
Epoch 3583/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1189 - accuracy:
0.9537 - val_loss: 0.0896 - val_accuracy: 0.9875
Epoch 3584/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1202 - accuracy:
0.9581 - val_loss: 0.0895 - val_accuracy: 0.9725
Epoch 3585/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1245 - accuracy:
0.9543 - val_loss: 0.1073 - val_accuracy: 0.9550
Epoch 3586/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1312 - accuracy:
0.9456 - val_loss: 0.0856 - val_accuracy: 0.9750
Epoch 3587/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1120 - accuracy:
0.9600 - val_loss: 0.0981 - val_accuracy: 0.9625
Epoch 3588/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1263 - accuracy:
0.9525 - val_loss: 0.0858 - val_accuracy: 0.9850
Epoch 3589/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1145 - accuracy:
0.9587 - val_loss: 0.0836 - val_accuracy: 0.9750
Epoch 3590/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1116 - accuracy:
0.9581 - val_loss: 0.1157 - val_accuracy: 0.9475
Epoch 3591/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1368 - accuracy:
0.9481 - val_loss: 0.0885 - val_accuracy: 0.9700
```

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Epoch 3592/5000
13/13 [==============================] - 0s 8ms/step - loss: 0.1856 - accuracy:
0.9256 - val_loss: 0.1372 - val_accuracy: 0.9375
Epoch 3593/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1962 - accuracy:
0.9187 - val_loss: 0.1706 - val_accuracy: 0.9250
Epoch 3594/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1345 - accuracy:
0.9487 - val_loss: 0.1507 - val_accuracy: 0.9325
Epoch 3595/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1148 - accuracy:
0.9550 - val_loss: 0.1223 - val_accuracy: 0.9375
Epoch 3596/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1348 - accuracy:
0.9425 - val_loss: 0.1251 - val_accuracy: 0.9750
Epoch 3597/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1162 - accuracy:
0.9593 - val_loss: 0.1113 - val_accuracy: 0.9600
Epoch 3598/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1194 - accuracy:
0.9500 - val_loss: 0.1908 - val_accuracy: 0.9075
Epoch 3599/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1555 - accuracy:
0.9381 - val_loss: 0.0849 - val_accuracy: 0.9775
Epoch 3600/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1145 - accuracy:
0.9606 - val_loss: 0.0779 - val_accuracy: 0.9850
Epoch 3601/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1115 - accuracy:
0.9625 - val_loss: 0.0747 - val_accuracy: 0.9775
Epoch 3602/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1130 - accuracy:
0.9562 - val_loss: 0.0947 - val_accuracy: 0.9750
Epoch 3603/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1261 - accuracy:
0.9512 - val_loss: 0.1015 - val_accuracy: 0.9825
Epoch 3604/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1200 - accuracy:
0.9487 - val_loss: 0.0849 - val_accuracy: 0.9750
Epoch 3605/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1155 - accuracy:
0.9587 - val_loss: 0.0968 - val_accuracy: 0.9875
Epoch 3606/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1077 - accuracy:
0.9587 - val_loss: 0.0863 - val_accuracy: 0.9700
Epoch 3607/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1142 - accuracy:
0.9537 - val_loss: 0.0792 - val_accuracy: 0.9750
```

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Epoch 3608/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1200 - accuracy:
0.9556 - val_loss: 0.0741 - val_accuracy: 0.9850
Epoch 3609/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1207 - accuracy:
0.9525 - val_loss: 0.0804 - val_accuracy: 0.9700
Epoch 3610/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1199 - accuracy:
0.9581 - val_loss: 0.1364 - val_accuracy: 0.9400
Epoch 3611/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1428 - accuracy:
0.9431 - val_loss: 0.0892 - val_accuracy: 0.9725
Epoch 3612/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1187 - accuracy:
0.9575 - val_loss: 0.1047 - val_accuracy: 0.9700
Epoch 3613/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1341 - accuracy:
0.9450 - val_loss: 0.0837 - val_accuracy: 0.9675
Epoch 3614/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1135 - accuracy:
0.9600 - val_loss: 0.1019 - val_accuracy: 0.9825
Epoch 3615/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1111 - accuracy:
0.9575 - val_loss: 0.0800 - val_accuracy: 0.9800
Epoch 3616/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1086 - accuracy:
0.9619 - val_loss: 0.1077 - val_accuracy: 0.9525
Epoch 3617/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1195 - accuracy:
0.9512 - val_loss: 0.0983 - val_accuracy: 0.9850
Epoch 3618/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1103 - accuracy:
0.9575 - val_loss: 0.0883 - val_accuracy: 0.9725
Epoch 3619/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1196 - accuracy:
0.9512 - val_loss: 0.1139 - val_accuracy: 0.9525
Epoch 3620/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1294 - accuracy:
0.9543 - val_loss: 0.0890 - val_accuracy: 0.9725
Epoch 3621/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1349 - accuracy:
0.9462 - val_loss: 0.1067 - val_accuracy: 0.9550
Epoch 3622/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1714 - accuracy:
0.9262 - val_loss: 0.1761 - val_accuracy: 0.9225
Epoch 3623/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1498 - accuracy:
0.9375 - val_loss: 0.0942 - val_accuracy: 0.9725
```

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Epoch 3624/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1138 - accuracy:
0.9556 - val_loss: 0.1417 - val_accuracy: 0.9600
Epoch 3625/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1479 - accuracy:
0.9387 - val_loss: 0.1987 - val_accuracy: 0.9100
Epoch 3626/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1617 - accuracy:
0.9287 - val_loss: 0.1043 - val_accuracy: 0.9750
Epoch 3627/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1209 - accuracy:
0.9581 - val_loss: 0.1018 - val_accuracy: 0.9475
Epoch 3628/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1319 - accuracy:
0.9500 - val_loss: 0.1189 - val_accuracy: 0.9600
Epoch 3629/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1238 - accuracy:
0.9537 - val_loss: 0.0790 - val_accuracy: 0.9850
Epoch 3630/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1249 - accuracy:
0.9531 - val_loss: 0.0786 - val_accuracy: 0.9775
Epoch 3631/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1112 - accuracy:
0.9606 - val_loss: 0.0811 - val_accuracy: 0.9850
Epoch 3632/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1153 - accuracy:
0.9568 - val_loss: 0.1053 - val_accuracy: 0.9700
Epoch 3633/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1156 - accuracy:
0.9568 - val_loss: 0.0868 - val_accuracy: 0.9675
Epoch 3634/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1321 - accuracy:
0.9500 - val_loss: 0.1022 - val_accuracy: 0.9800
Epoch 3635/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1460 - accuracy:
0.9450 - val_loss: 0.1260 - val_accuracy: 0.9400
Epoch 3636/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1424 - accuracy:
0.9443 - val_loss: 0.0758 - val_accuracy: 0.9800
Epoch 3637/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1098 - accuracy:
0.9637 - val_loss: 0.0781 - val_accuracy: 0.9825
Epoch 3638/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1126 - accuracy:
0.9625 - val_loss: 0.0972 - val_accuracy: 0.9850
Epoch 3639/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1112 - accuracy:
0.9575 - val_loss: 0.1107 - val_accuracy: 0.9800
```

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Epoch 3640/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1180 - accuracy:
0.9581 - val_loss: 0.0960 - val_accuracy: 0.9775
Epoch 3641/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1154 - accuracy:
0.9518 - val_loss: 0.0913 - val_accuracy: 0.9675
Epoch 3642/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1143 - accuracy:
0.9562 - val_loss: 0.0888 - val_accuracy: 0.9850
Epoch 3643/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1094 - accuracy:
0.9575 - val_loss: 0.0867 - val_accuracy: 0.9750
Epoch 3644/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1024 - accuracy:
0.9619 - val_loss: 0.0996 - val_accuracy: 0.9800
Epoch 3645/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1084 - accuracy:
0.9600 - val_loss: 0.1243 - val_accuracy: 0.9525
Epoch 3646/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1190 - accuracy:
0.9512 - val_loss: 0.0929 - val_accuracy: 0.9675
Epoch 3647/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1094 - accuracy:
0.9619 - val_loss: 0.0833 - val_accuracy: 0.9725
Epoch 3648/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1197 - accuracy:
0.9550 - val_loss: 0.0946 - val_accuracy: 0.9700
Epoch 3649/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1154 - accuracy:
0.9593 - val_loss: 0.0841 - val_accuracy: 0.9800
Epoch 3650/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1117 - accuracy:
0.9600 - val_loss: 0.0910 - val_accuracy: 0.9825
Epoch 3651/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1106 - accuracy:
0.9587 - val_loss: 0.0771 - val_accuracy: 0.9825
Epoch 3652/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1079 - accuracy:
0.9606 - val_loss: 0.1012 - val_accuracy: 0.9700
Epoch 3653/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1040 - accuracy:
0.9644 - val_loss: 0.0929 - val_accuracy: 0.9700
Epoch 3654/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1076 - accuracy:
0.9606 - val_loss: 0.1627 - val_accuracy: 0.9300
Epoch 3655/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1588 - accuracy:
0.9312 - val_loss: 0.1668 - val_accuracy: 0.9275
```

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Epoch 3656/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1354 - accuracy:
0.9500 - val_loss: 0.0994 - val_accuracy: 0.9725
Epoch 3657/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1167 - accuracy:
0.9600 - val_loss: 0.0858 - val_accuracy: 0.9850
Epoch 3658/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1074 - accuracy:
0.9619 - val_loss: 0.1001 - val_accuracy: 0.9725
Epoch 3659/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1263 - accuracy:
0.9481 - val_loss: 0.0789 - val_accuracy: 0.9825
Epoch 3660/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1077 - accuracy:
0.9612 - val_loss: 0.0743 - val_accuracy: 0.9850
Epoch 3661/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1245 - accuracy:
0.9475 - val_loss: 0.1084 - val_accuracy: 0.9600
Epoch 3662/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1190 - accuracy:
0.9568 - val_loss: 0.1392 - val_accuracy: 0.9725
Epoch 3663/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1171 - accuracy:
0.9581 - val_loss: 0.0881 - val_accuracy: 0.9875
Epoch 3664/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1406 - accuracy:
0.9418 - val_loss: 0.1251 - val_accuracy: 0.9300
Epoch 3665/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1633 - accuracy:
0.9337 - val_loss: 0.0854 - val_accuracy: 0.9750
Epoch 3666/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1407 - accuracy:
0.9337 - val_loss: 0.0898 - val_accuracy: 0.9750
Epoch 3667/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1486 - accuracy:
0.9350 - val_loss: 0.1261 - val_accuracy: 0.9550
Epoch 3668/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1421 - accuracy:
0.9418 - val_loss: 0.0914 - val_accuracy: 0.9850
Epoch 3669/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1366 - accuracy:
0.9456 - val_loss: 0.1491 - val_accuracy: 0.9275
Epoch 3670/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1412 - accuracy:
0.9387 - val_loss: 0.2328 - val_accuracy: 0.9050
Epoch 3671/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1482 - accuracy:
0.9381 - val_loss: 0.0762 - val_accuracy: 0.9800
```

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Epoch 3672/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1168 - accuracy:
0.9525 - val_loss: 0.0746 - val_accuracy: 0.9825
Epoch 3673/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1289 - accuracy:
0.9468 - val_loss: 0.1094 - val_accuracy: 0.9550
Epoch 3674/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1378 - accuracy:
0.9500 - val_loss: 0.1023 - val_accuracy: 0.9750
Epoch 3675/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1120 - accuracy:
0.9587 - val_loss: 0.1029 - val_accuracy: 0.9725
Epoch 3676/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1371 - accuracy:
0.9487 - val_loss: 0.0816 - val_accuracy: 0.9800
Epoch 3677/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1363 - accuracy:
0.9450 - val_loss: 0.0812 - val_accuracy: 0.9800
Epoch 3678/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1169 - accuracy:
0.9581 - val_loss: 0.0926 - val_accuracy: 0.9800
Epoch 3679/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1126 - accuracy:
0.9593 - val_loss: 0.0990 - val_accuracy: 0.9625
Epoch 3680/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1146 - accuracy:
0.9568 - val_loss: 0.1368 - val_accuracy: 0.9525
Epoch 3681/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1483 - accuracy:
0.9362 - val_loss: 0.0848 - val_accuracy: 0.9775
Epoch 3682/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1302 - accuracy:
0.9512 - val_loss: 0.0894 - val_accuracy: 0.9775
Epoch 3683/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1261 - accuracy:
0.9506 - val_loss: 0.0796 - val_accuracy: 0.9775
Epoch 3684/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1163 - accuracy:
0.9600 - val_loss: 0.0857 - val_accuracy: 0.9875
Epoch 3685/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1103 - accuracy:
0.9612 - val_loss: 0.0848 - val_accuracy: 0.9750
Epoch 3686/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1064 - accuracy:
0.9631 - val_loss: 0.1173 - val_accuracy: 0.9525
Epoch 3687/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1249 - accuracy:
0.9531 - val_loss: 0.1384 - val_accuracy: 0.9675
```

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Epoch 3688/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1291 - accuracy:
0.9506 - val_loss: 0.1122 - val_accuracy: 0.9550
Epoch 3689/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1347 - accuracy:
0.9443 - val_loss: 0.1120 - val_accuracy: 0.9675
Epoch 3690/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1201 - accuracy:
0.9600 - val_loss: 0.1005 - val_accuracy: 0.9600
Epoch 3691/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1135 - accuracy:
0.9550 - val_loss: 0.0745 - val_accuracy: 0.9800
Epoch 3692/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1089 - accuracy:
0.9600 - val_loss: 0.0995 - val_accuracy: 0.9850
Epoch 3693/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1044 - accuracy:
0.9631 - val_loss: 0.1505 - val_accuracy: 0.9325
Epoch 3694/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1310 - accuracy:
0.9456 - val_loss: 0.0819 - val_accuracy: 0.9625
Epoch 3695/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1225 - accuracy:
0.9581 - val_loss: 0.1002 - val_accuracy: 0.9850
Epoch 3696/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1092 - accuracy:
0.9606 - val_loss: 0.0890 - val_accuracy: 0.9725
Epoch 3697/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1106 - accuracy:
0.9587 - val_loss: 0.1024 - val_accuracy: 0.9675
Epoch 3698/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1080 - accuracy:
0.9593 - val_loss: 0.0934 - val_accuracy: 0.9750
Epoch 3699/5000
13/13 [==============================] - 0s 17ms/step - loss: 0.1112 - accuracy:
0.9606 - val_loss: 0.0753 - val_accuracy: 0.9900
Epoch 3700/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1065 - accuracy:
0.9662 - val_loss: 0.0830 - val_accuracy: 0.9725
Epoch 3701/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1121 - accuracy:
0.9612 - val_loss: 0.1003 - val_accuracy: 0.9825
Epoch 3702/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1163 - accuracy:
0.9531 - val_loss: 0.1012 - val_accuracy: 0.9800
Epoch 3703/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1164 - accuracy:
0.9575 - val_loss: 0.0737 - val_accuracy: 0.9775
```

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Epoch 3704/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1156 - accuracy:
0.9575 - val_loss: 0.1075 - val_accuracy: 0.9525
Epoch 3705/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1370 - accuracy:
0.9443 - val_loss: 0.1172 - val_accuracy: 0.9550
Epoch 3706/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1157 - accuracy:
0.9543 - val_loss: 0.0838 - val_accuracy: 0.9825
Epoch 3707/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1175 - accuracy:
0.9543 - val_loss: 0.0737 - val_accuracy: 0.9775
Epoch 3708/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1155 - accuracy:
0.9550 - val_loss: 0.0775 - val_accuracy: 0.9850
Epoch 3709/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1042 - accuracy:
0.9644 - val_loss: 0.0730 - val_accuracy: 0.9775
Epoch 3710/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1150 - accuracy:
0.9568 - val_loss: 0.0838 - val_accuracy: 0.9675
Epoch 3711/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1419 - accuracy:
0.9437 - val_loss: 0.1378 - val_accuracy: 0.9500
Epoch 3712/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1405 - accuracy:
0.9468 - val_loss: 0.1086 - val_accuracy: 0.9700
Epoch 3713/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1131 - accuracy:
0.9550 - val_loss: 0.1115 - val_accuracy: 0.9575
Epoch 3714/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1163 - accuracy:
0.9593 - val_loss: 0.0914 - val_accuracy: 0.9725
Epoch 3715/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1159 - accuracy:
0.9556 - val_loss: 0.0771 - val_accuracy: 0.9875
Epoch 3716/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1148 - accuracy:
0.9518 - val_loss: 0.0843 - val_accuracy: 0.9775
Epoch 3717/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1365 - accuracy:
0.9431 - val_loss: 0.0884 - val_accuracy: 0.9775
Epoch 3718/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1222 - accuracy:
0.9550 - val_loss: 0.0785 - val_accuracy: 0.9750
Epoch 3719/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1029 - accuracy:
0.9625 - val_loss: 0.1313 - val_accuracy: 0.9300
```

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Epoch 3720/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1240 - accuracy:
0.9475 - val_loss: 0.0739 - val_accuracy: 0.9825
Epoch 3721/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1043 - accuracy:
0.9606 - val_loss: 0.0742 - val_accuracy: 0.9800
Epoch 3722/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1060 - accuracy:
0.9606 - val_loss: 0.1095 - val_accuracy: 0.9725
Epoch 3723/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1152 - accuracy:
0.9593 - val_loss: 0.0971 - val_accuracy: 0.9850
Epoch 3724/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1143 - accuracy:
0.9581 - val_loss: 0.1251 - val_accuracy: 0.9475
Epoch 3725/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1445 - accuracy:
0.9450 - val_loss: 0.1063 - val_accuracy: 0.9675
Epoch 3726/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1289 - accuracy:
0.9500 - val_loss: 0.0754 - val_accuracy: 0.9775
Epoch 3727/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1564 - accuracy:
0.9418 - val_loss: 0.1390 - val_accuracy: 0.9550
Epoch 3728/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1722 - accuracy:
0.9268 - val_loss: 0.1036 - val_accuracy: 0.9650
Epoch 3729/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1239 - accuracy:
0.9587 - val_loss: 0.0732 - val_accuracy: 0.9900
Epoch 3730/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1128 - accuracy:
0.9619 - val_loss: 0.1002 - val_accuracy: 0.9825
Epoch 3731/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1239 - accuracy:
0.9562 - val_loss: 0.0823 - val_accuracy: 0.9825
Epoch 3732/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1222 - accuracy:
0.9493 - val_loss: 0.0811 - val_accuracy: 0.9700
Epoch 3733/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1130 - accuracy:
0.9562 - val_loss: 0.0885 - val_accuracy: 0.9850
Epoch 3734/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1069 - accuracy:
0.9625 - val_loss: 0.1000 - val_accuracy: 0.9775
Epoch 3735/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1094 - accuracy:
0.9637 - val_loss: 0.0828 - val_accuracy: 0.9725
```

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Epoch 3736/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1095 - accuracy:
0.9593 - val_loss: 0.1166 - val_accuracy: 0.9625
Epoch 3737/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1177 - accuracy:
0.9543 - val_loss: 0.1264 - val_accuracy: 0.9450
Epoch 3738/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1355 - accuracy:
0.9400 - val_loss: 0.0712 - val_accuracy: 0.9850
Epoch 3739/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1306 - accuracy:
0.9500 - val_loss: 0.1144 - val_accuracy: 0.9525
Epoch 3740/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1331 - accuracy:
0.9500 - val_loss: 0.1522 - val_accuracy: 0.9475
Epoch 3741/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1438 - accuracy:
0.9406 - val_loss: 0.1151 - val_accuracy: 0.9550
Epoch 3742/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1265 - accuracy:
0.9556 - val_loss: 0.0729 - val_accuracy: 0.9800
Epoch 3743/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1040 - accuracy:
0.9625 - val_loss: 0.0709 - val_accuracy: 0.9750
Epoch 3744/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1068 - accuracy:
0.9619 - val_loss: 0.0805 - val_accuracy: 0.9875
Epoch 3745/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1056 - accuracy:
0.9581 - val_loss: 0.0737 - val_accuracy: 0.9875
Epoch 3746/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1129 - accuracy:
0.9606 - val_loss: 0.0854 - val_accuracy: 0.9750
Epoch 3747/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1110 - accuracy:
0.9625 - val_loss: 0.1036 - val_accuracy: 0.9575
Epoch 3748/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1148 - accuracy:
0.9556 - val_loss: 0.1058 - val_accuracy: 0.9625
Epoch 3749/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1248 - accuracy:
0.9468 - val_loss: 0.0874 - val_accuracy: 0.9800
Epoch 3750/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1283 - accuracy:
0.9525 - val_loss: 0.0849 - val_accuracy: 0.9775
Epoch 3751/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1236 - accuracy:
0.9543 - val_loss: 0.0943 - val_accuracy: 0.9800
```

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Epoch 3752/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1078 - accuracy:
0.9593 - val_loss: 0.0824 - val_accuracy: 0.9700
Epoch 3753/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1025 - accuracy:
0.9637 - val_loss: 0.0996 - val_accuracy: 0.9600
Epoch 3754/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1206 - accuracy:
0.9525 - val_loss: 0.0849 - val_accuracy: 0.9700
Epoch 3755/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1277 - accuracy:
0.9506 - val_loss: 0.0820 - val_accuracy: 0.9750
Epoch 3756/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1170 - accuracy:
0.9537 - val_loss: 0.1243 - val_accuracy: 0.9800
Epoch 3757/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1150 - accuracy:
0.9600 - val_loss: 0.1531 - val_accuracy: 0.9375
Epoch 3758/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1421 - accuracy:
0.9368 - val_loss: 0.0775 - val_accuracy: 0.9750
Epoch 3759/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1332 - accuracy:
0.9437 - val_loss: 0.1476 - val_accuracy: 0.9650
Epoch 3760/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1901 - accuracy:
0.9243 - val_loss: 0.2460 - val_accuracy: 0.8925
Epoch 3761/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1929 - accuracy:
0.9237 - val_loss: 0.1034 - val_accuracy: 0.9525
Epoch 3762/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1336 - accuracy:
0.9506 - val_loss: 0.0804 - val_accuracy: 0.9800
Epoch 3763/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1232 - accuracy:
0.9581 - val_loss: 0.1023 - val_accuracy: 0.9650
Epoch 3764/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1101 - accuracy:
0.9593 - val_loss: 0.0845 - val_accuracy: 0.9875
Epoch 3765/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1046 - accuracy:
0.9644 - val_loss: 0.0925 - val_accuracy: 0.9800
Epoch 3766/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1141 - accuracy:
0.9587 - val_loss: 0.1673 - val_accuracy: 0.9225
Epoch 3767/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1346 - accuracy:
0.9387 - val_loss: 0.0854 - val_accuracy: 0.9775
```

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Epoch 3768/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1060 - accuracy:
0.9587 - val_loss: 0.0694 - val_accuracy: 0.9800
Epoch 3769/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1104 - accuracy:
0.9631 - val_loss: 0.0826 - val_accuracy: 0.9850
Epoch 3770/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1167 - accuracy:
0.9556 - val_loss: 0.0833 - val_accuracy: 0.9825
Epoch 3771/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1279 - accuracy:
0.9512 - val_loss: 0.0759 - val_accuracy: 0.9825
Epoch 3772/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1111 - accuracy:
0.9568 - val_loss: 0.0836 - val_accuracy: 0.9725
Epoch 3773/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1204 - accuracy:
0.9500 - val_loss: 0.1127 - val_accuracy: 0.9650
Epoch 3774/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1108 - accuracy:
0.9606 - val_loss: 0.0912 - val_accuracy: 0.9700
Epoch 3775/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1311 - accuracy:
0.9462 - val_loss: 0.1351 - val_accuracy: 0.9275
Epoch 3776/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1437 - accuracy:
0.9368 - val_loss: 0.1005 - val_accuracy: 0.9750
Epoch 3777/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1352 - accuracy:
0.9393 - val_loss: 0.1125 - val_accuracy: 0.9575
Epoch 3778/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1398 - accuracy:
0.9425 - val_loss: 0.0897 - val_accuracy: 0.9750
Epoch 3779/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1104 - accuracy:
0.9625 - val_loss: 0.1112 - val_accuracy: 0.9600
Epoch 3780/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1255 - accuracy:
0.9518 - val_loss: 0.0870 - val_accuracy: 0.9850
Epoch 3781/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1125 - accuracy:
0.9556 - val_loss: 0.0922 - val_accuracy: 0.9775
Epoch 3782/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1213 - accuracy:
0.9537 - val_loss: 0.0836 - val_accuracy: 0.9800
Epoch 3783/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1172 - accuracy:
0.9525 - val_loss: 0.0833 - val_accuracy: 0.9750
```

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Epoch 3784/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1292 - accuracy:
0.9475 - val_loss: 0.0916 - val_accuracy: 0.9750
Epoch 3785/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1070 - accuracy:
0.9644 - val_loss: 0.0775 - val_accuracy: 0.9875
Epoch 3786/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1163 - accuracy:
0.9550 - val_loss: 0.0861 - val_accuracy: 0.9850
Epoch 3787/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1229 - accuracy:
0.9537 - val_loss: 0.0823 - val_accuracy: 0.9800
Epoch 3788/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1155 - accuracy:
0.9593 - val_loss: 0.0762 - val_accuracy: 0.9800
Epoch 3789/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1056 - accuracy:
0.9631 - val_loss: 0.1060 - val_accuracy: 0.9700
Epoch 3790/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1193 - accuracy:
0.9518 - val_loss: 0.1372 - val_accuracy: 0.9725
Epoch 3791/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1334 - accuracy:
0.9450 - val_loss: 0.0903 - val_accuracy: 0.9875
Epoch 3792/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1222 - accuracy:
0.9568 - val_loss: 0.0786 - val_accuracy: 0.9750
Epoch 3793/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1140 - accuracy:
0.9562 - val_loss: 0.1309 - val_accuracy: 0.9500
Epoch 3794/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1273 - accuracy:
0.9468 - val_loss: 0.1173 - val_accuracy: 0.9750
Epoch 3795/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1293 - accuracy:
0.9468 - val_loss: 0.1538 - val_accuracy: 0.9300
Epoch 3796/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1236 - accuracy:
0.9531 - val_loss: 0.0794 - val_accuracy: 0.9775
Epoch 3797/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1154 - accuracy:
0.9543 - val_loss: 0.1451 - val_accuracy: 0.9475
Epoch 3798/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1376 - accuracy:
0.9425 - val_loss: 0.1422 - val_accuracy: 0.9475
Epoch 3799/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1250 - accuracy:
0.9493 - val_loss: 0.0963 - val_accuracy: 0.9775
```

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Epoch 3800/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1223 - accuracy:
0.9575 - val_loss: 0.0794 - val_accuracy: 0.9800
Epoch 3801/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1167 - accuracy:
0.9550 - val_loss: 0.0868 - val_accuracy: 0.9800
Epoch 3802/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1099 - accuracy:
0.9575 - val_loss: 0.0855 - val_accuracy: 0.9800
Epoch 3803/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1106 - accuracy:
0.9606 - val_loss: 0.0955 - val_accuracy: 0.9700
Epoch 3804/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1122 - accuracy:
0.9600 - val_loss: 0.0744 - val_accuracy: 0.9775
Epoch 3805/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1133 - accuracy:
0.9525 - val_loss: 0.1365 - val_accuracy: 0.9350
Epoch 3806/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1613 - accuracy:
0.9293 - val_loss: 0.1046 - val_accuracy: 0.9675
Epoch 3807/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1993 - accuracy:
0.9275 - val_loss: 0.0830 - val_accuracy: 0.9825
Epoch 3808/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1985 - accuracy:
0.9312 - val_loss: 0.1607 - val_accuracy: 0.9350
Epoch 3809/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1539 - accuracy:
0.9412 - val_loss: 0.1255 - val_accuracy: 0.9775
Epoch 3810/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1179 - accuracy:
0.9606 - val_loss: 0.0867 - val_accuracy: 0.9800
Epoch 3811/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1205 - accuracy:
0.9543 - val_loss: 0.0956 - val_accuracy: 0.9875
Epoch 3812/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1320 - accuracy:
0.9462 - val_loss: 0.0810 - val_accuracy: 0.9775
Epoch 3813/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1199 - accuracy:
0.9537 - val_loss: 0.0844 - val_accuracy: 0.9750
Epoch 3814/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1126 - accuracy:
0.9600 - val_loss: 0.0877 - val_accuracy: 0.9825
Epoch 3815/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1122 - accuracy:
0.9600 - val_loss: 0.0825 - val_accuracy: 0.9775
```

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Epoch 3816/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1135 - accuracy:
0.9581 - val_loss: 0.1104 - val_accuracy: 0.9600
Epoch 3817/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1122 - accuracy:
0.9543 - val_loss: 0.1150 - val_accuracy: 0.9475
Epoch 3818/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1175 - accuracy:
0.9550 - val_loss: 0.0750 - val_accuracy: 0.9800
Epoch 3819/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1065 - accuracy:
0.9562 - val_loss: 0.0969 - val_accuracy: 0.9775
Epoch 3820/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1037 - accuracy:
0.9662 - val_loss: 0.0996 - val_accuracy: 0.9775
Epoch 3821/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1218 - accuracy:
0.9543 - val_loss: 0.0780 - val_accuracy: 0.9725
Epoch 3822/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1215 - accuracy:
0.9487 - val_loss: 0.0840 - val_accuracy: 0.9675
Epoch 3823/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1182 - accuracy:
0.9512 - val_loss: 0.0987 - val_accuracy: 0.9725
Epoch 3824/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1068 - accuracy:
0.9625 - val_loss: 0.1064 - val_accuracy: 0.9650
Epoch 3825/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1256 - accuracy:
0.9437 - val_loss: 0.0905 - val_accuracy: 0.9700
Epoch 3826/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1209 - accuracy:
0.9525 - val_loss: 0.0928 - val_accuracy: 0.9875
Epoch 3827/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1039 - accuracy:
0.9593 - val_loss: 0.0726 - val_accuracy: 0.9750
Epoch 3828/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1089 - accuracy:
0.9593 - val_loss: 0.1134 - val_accuracy: 0.9500
Epoch 3829/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1358 - accuracy:
0.9431 - val_loss: 0.2073 - val_accuracy: 0.9075
Epoch 3830/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1706 - accuracy:
0.9206 - val_loss: 0.0927 - val_accuracy: 0.9675
Epoch 3831/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1395 - accuracy:
0.9481 - val_loss: 0.1158 - val_accuracy: 0.9750
```

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Epoch 3832/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1384 - accuracy:
0.9381 - val_loss: 0.0801 - val_accuracy: 0.9875
Epoch 3833/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1239 - accuracy:
0.9543 - val_loss: 0.0875 - val_accuracy: 0.9725
Epoch 3834/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1196 - accuracy:
0.9525 - val_loss: 0.1027 - val_accuracy: 0.9525
Epoch 3835/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1107 - accuracy:
0.9581 - val_loss: 0.0912 - val_accuracy: 0.9775
Epoch 3836/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1120 - accuracy:
0.9581 - val_loss: 0.0729 - val_accuracy: 0.9775
Epoch 3837/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1133 - accuracy:
0.9612 - val_loss: 0.0800 - val_accuracy: 0.9725
Epoch 3838/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1095 - accuracy:
0.9612 - val_loss: 0.0774 - val_accuracy: 0.9775
Epoch 3839/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1109 - accuracy:
0.9637 - val_loss: 0.0801 - val_accuracy: 0.9825
Epoch 3840/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1109 - accuracy:
0.9612 - val_loss: 0.1058 - val_accuracy: 0.9625
Epoch 3841/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1244 - accuracy:
0.9456 - val_loss: 0.0791 - val_accuracy: 0.9775
Epoch 3842/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1069 - accuracy:
0.9625 - val_loss: 0.0905 - val_accuracy: 0.9775
Epoch 3843/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1067 - accuracy:
0.9600 - val_loss: 0.0848 - val_accuracy: 0.9800
Epoch 3844/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1067 - accuracy:
0.9619 - val_loss: 0.0768 - val_accuracy: 0.9825
Epoch 3845/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1075 - accuracy:
0.9606 - val_loss: 0.0940 - val_accuracy: 0.9800
Epoch 3846/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1060 - accuracy:
0.9637 - val_loss: 0.1195 - val_accuracy: 0.9550
Epoch 3847/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1153 - accuracy:
0.9506 - val_loss: 0.0840 - val_accuracy: 0.9900
```

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Epoch 3848/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1168 - accuracy:
0.9600 - val_loss: 0.0882 - val_accuracy: 0.9625
Epoch 3849/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1156 - accuracy:
0.9537 - val_loss: 0.0926 - val_accuracy: 0.9825
Epoch 3850/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1071 - accuracy:
0.9600 - val_loss: 0.0819 - val_accuracy: 0.9900
Epoch 3851/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1207 - accuracy:
0.9568 - val_loss: 0.0747 - val_accuracy: 0.9825
Epoch 3852/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1386 - accuracy:
0.9431 - val_loss: 0.1665 - val_accuracy: 0.9425
Epoch 3853/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2003 - accuracy:
0.9156 - val_loss: 0.1471 - val_accuracy: 0.9500
Epoch 3854/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1675 - accuracy:
0.9337 - val_loss: 0.1745 - val_accuracy: 0.9300
Epoch 3855/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1698 - accuracy:
0.9400 - val_loss: 0.1174 - val_accuracy: 0.9650
Epoch 3856/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1274 - accuracy:
0.9568 - val_loss: 0.0858 - val_accuracy: 0.9775
Epoch 3857/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1139 - accuracy:
0.9631 - val_loss: 0.0996 - val_accuracy: 0.9700
Epoch 3858/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1153 - accuracy:
0.9581 - val_loss: 0.0972 - val_accuracy: 0.9675
Epoch 3859/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1196 - accuracy:
0.9562 - val_loss: 0.0994 - val_accuracy: 0.9700
Epoch 3860/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1173 - accuracy:
0.9575 - val_loss: 0.0836 - val_accuracy: 0.9775
Epoch 3861/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1513 - accuracy:
0.9468 - val_loss: 0.1811 - val_accuracy: 0.9225
Epoch 3862/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1225 - accuracy:
0.9556 - val_loss: 0.0944 - val_accuracy: 0.9625
Epoch 3863/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1122 - accuracy:
0.9600 - val_loss: 0.0723 - val_accuracy: 0.9875
```

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Epoch 3864/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1092 - accuracy:
0.9619 - val_loss: 0.0962 - val_accuracy: 0.9825
Epoch 3865/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1198 - accuracy:
0.9556 - val_loss: 0.0893 - val_accuracy: 0.9775
Epoch 3866/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1123 - accuracy:
0.9587 - val_loss: 0.0777 - val_accuracy: 0.9825
Epoch 3867/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1077 - accuracy:
0.9619 - val_loss: 0.0864 - val_accuracy: 0.9750
Epoch 3868/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1092 - accuracy:
0.9619 - val_loss: 0.0766 - val_accuracy: 0.9775
Epoch 3869/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1074 - accuracy:
0.9593 - val_loss: 0.1008 - val_accuracy: 0.9650
Epoch 3870/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1099 - accuracy:
0.9593 - val_loss: 0.1476 - val_accuracy: 0.9450
Epoch 3871/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1240 - accuracy:
0.9525 - val_loss: 0.1015 - val_accuracy: 0.9625
Epoch 3872/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1097 - accuracy:
0.9619 - val_loss: 0.0858 - val_accuracy: 0.9800
Epoch 3873/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1040 - accuracy:
0.9631 - val_loss: 0.0843 - val_accuracy: 0.9750
Epoch 3874/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1174 - accuracy:
0.9531 - val_loss: 0.0923 - val_accuracy: 0.9700
Epoch 3875/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1091 - accuracy:
0.9575 - val_loss: 0.0703 - val_accuracy: 0.9825
Epoch 3876/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1080 - accuracy:
0.9612 - val_loss: 0.0774 - val_accuracy: 0.9875
Epoch 3877/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1159 - accuracy:
0.9581 - val_loss: 0.0842 - val_accuracy: 0.9825
Epoch 3878/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1227 - accuracy:
0.9506 - val_loss: 0.0711 - val_accuracy: 0.9825
Epoch 3879/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1107 - accuracy:
0.9581 - val_loss: 0.0930 - val_accuracy: 0.9875
```

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Epoch 3880/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1103 - accuracy:
0.9600 - val_loss: 0.0972 - val_accuracy: 0.9825
Epoch 3881/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1305 - accuracy:
0.9475 - val_loss: 0.1117 - val_accuracy: 0.9475
Epoch 3882/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1296 - accuracy:
0.9500 - val_loss: 0.0928 - val_accuracy: 0.9650
Epoch 3883/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1651 - accuracy:
0.9343 - val_loss: 0.1109 - val_accuracy: 0.9625
Epoch 3884/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1514 - accuracy:
0.9412 - val_loss: 0.1134 - val_accuracy: 0.9625
Epoch 3885/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1400 - accuracy:
0.9506 - val_loss: 0.1645 - val_accuracy: 0.9475
Epoch 3886/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1424 - accuracy:
0.9400 - val_loss: 0.1229 - val_accuracy: 0.9775
Epoch 3887/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1299 - accuracy:
0.9487 - val_loss: 0.1492 - val_accuracy: 0.9625
Epoch 3888/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1227 - accuracy:
0.9531 - val_loss: 0.0918 - val_accuracy: 0.9800
Epoch 3889/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1210 - accuracy:
0.9512 - val_loss: 0.0794 - val_accuracy: 0.9825
Epoch 3890/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1172 - accuracy:
0.9556 - val_loss: 0.0843 - val_accuracy: 0.9675
Epoch 3891/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1215 - accuracy:
0.9493 - val_loss: 0.0901 - val_accuracy: 0.9675
Epoch 3892/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1132 - accuracy:
0.9606 - val_loss: 0.0734 - val_accuracy: 0.9850
Epoch 3893/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1067 - accuracy:
0.9619 - val_loss: 0.0898 - val_accuracy: 0.9850
Epoch 3894/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1107 - accuracy:
0.9600 - val_loss: 0.1091 - val_accuracy: 0.9400
Epoch 3895/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1350 - accuracy:
0.9400 - val_loss: 0.0996 - val_accuracy: 0.9650
```

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Epoch 3896/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1179 - accuracy:
0.9587 - val_loss: 0.0770 - val_accuracy: 0.9825
Epoch 3897/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1040 - accuracy:
0.9631 - val_loss: 0.0772 - val_accuracy: 0.9850
Epoch 3898/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1154 - accuracy:
0.9568 - val_loss: 0.1142 - val_accuracy: 0.9600
Epoch 3899/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1248 - accuracy:
0.9506 - val_loss: 0.0731 - val_accuracy: 0.9825
Epoch 3900/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1209 - accuracy:
0.9512 - val_loss: 0.1013 - val_accuracy: 0.9675
Epoch 3901/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1164 - accuracy:
0.9575 - val_loss: 0.1598 - val_accuracy: 0.9275
Epoch 3902/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1249 - accuracy:
0.9418 - val_loss: 0.0802 - val_accuracy: 0.9750
Epoch 3903/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1256 - accuracy:
0.9450 - val_loss: 0.1109 - val_accuracy: 0.9425
Epoch 3904/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1204 - accuracy:
0.9531 - val_loss: 0.0778 - val_accuracy: 0.9825
Epoch 3905/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1084 - accuracy:
0.9637 - val_loss: 0.0891 - val_accuracy: 0.9850
Epoch 3906/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1137 - accuracy:
0.9650 - val_loss: 0.0915 - val_accuracy: 0.9850
Epoch 3907/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1147 - accuracy:
0.9556 - val_loss: 0.1051 - val_accuracy: 0.9550
Epoch 3908/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1329 - accuracy:
0.9456 - val_loss: 0.0879 - val_accuracy: 0.9775
Epoch 3909/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1271 - accuracy:
0.9468 - val_loss: 0.0874 - val_accuracy: 0.9800
Epoch 3910/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1091 - accuracy:
0.9593 - val_loss: 0.0919 - val_accuracy: 0.9750
Epoch 3911/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1107 - accuracy:
0.9575 - val_loss: 0.0873 - val_accuracy: 0.9750
```

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Epoch 3912/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1220 - accuracy:
0.9506 - val_loss: 0.0819 - val_accuracy: 0.9775
Epoch 3913/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1355 - accuracy:
0.9481 - val_loss: 0.1058 - val_accuracy: 0.9750
Epoch 3914/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1160 - accuracy:
0.9619 - val_loss: 0.0847 - val_accuracy: 0.9775
Epoch 3915/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1166 - accuracy:
0.9575 - val_loss: 0.0854 - val_accuracy: 0.9675
Epoch 3916/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1222 - accuracy:
0.9543 - val_loss: 0.1047 - val_accuracy: 0.9825
Epoch 3917/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1063 - accuracy:
0.9656 - val_loss: 0.0775 - val_accuracy: 0.9800
Epoch 3918/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1115 - accuracy:
0.9562 - val_loss: 0.0975 - val_accuracy: 0.9725
Epoch 3919/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1655 - accuracy:
0.9281 - val_loss: 0.1283 - val_accuracy: 0.9500
Epoch 3920/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1658 - accuracy:
0.9356 - val_loss: 0.0989 - val_accuracy: 0.9575
Epoch 3921/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1475 - accuracy:
0.9387 - val_loss: 0.0954 - val_accuracy: 0.9850
Epoch 3922/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1335 - accuracy:
0.9493 - val_loss: 0.0964 - val_accuracy: 0.9650
Epoch 3923/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1438 - accuracy:
0.9475 - val_loss: 0.1956 - val_accuracy: 0.9025
Epoch 3924/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1573 - accuracy:
0.9437 - val_loss: 0.0733 - val_accuracy: 0.9800
Epoch 3925/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1337 - accuracy:
0.9406 - val_loss: 0.1346 - val_accuracy: 0.9425
Epoch 3926/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1343 - accuracy:
0.9468 - val_loss: 0.0743 - val_accuracy: 0.9900
Epoch 3927/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1224 - accuracy:
0.9493 - val_loss: 0.0828 - val_accuracy: 0.9750
```

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Epoch 3928/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1197 - accuracy:
0.9568 - val_loss: 0.0786 - val_accuracy: 0.9875
Epoch 3929/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1104 - accuracy:
0.9631 - val_loss: 0.0978 - val_accuracy: 0.9725
Epoch 3930/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1112 - accuracy:
0.9612 - val_loss: 0.0869 - val_accuracy: 0.9775
Epoch 3931/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1203 - accuracy:
0.9543 - val_loss: 0.0729 - val_accuracy: 0.9875
Epoch 3932/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1133 - accuracy:
0.9575 - val_loss: 0.0760 - val_accuracy: 0.9875
Epoch 3933/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1042 - accuracy:
0.9612 - val_loss: 0.0938 - val_accuracy: 0.9700
Epoch 3934/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1110 - accuracy:
0.9612 - val_loss: 0.0918 - val_accuracy: 0.9700
Epoch 3935/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1088 - accuracy:
0.9612 - val_loss: 0.0910 - val_accuracy: 0.9625
Epoch 3936/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1020 - accuracy:
0.9637 - val_loss: 0.0848 - val_accuracy: 0.9775
Epoch 3937/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1098 - accuracy:
0.9625 - val_loss: 0.0862 - val_accuracy: 0.9800
Epoch 3938/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1065 - accuracy:
0.9650 - val_loss: 0.0961 - val_accuracy: 0.9750
Epoch 3939/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1098 - accuracy:
0.9619 - val_loss: 0.0855 - val_accuracy: 0.9775
Epoch 3940/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1086 - accuracy:
0.9606 - val_loss: 0.0895 - val_accuracy: 0.9675
Epoch 3941/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1011 - accuracy:
0.9662 - val_loss: 0.0780 - val_accuracy: 0.9825
Epoch 3942/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1233 - accuracy:
0.9562 - val_loss: 0.0961 - val_accuracy: 0.9600
Epoch 3943/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1381 - accuracy:
0.9425 - val_loss: 0.1249 - val_accuracy: 0.9700
```

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Epoch 3944/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1200 - accuracy:
0.9537 - val_loss: 0.0721 - val_accuracy: 0.9900
Epoch 3945/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1222 - accuracy:
0.9531 - val_loss: 0.0803 - val_accuracy: 0.9825
Epoch 3946/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1124 - accuracy:
0.9606 - val_loss: 0.0736 - val_accuracy: 0.9875
Epoch 3947/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1179 - accuracy:
0.9612 - val_loss: 0.0971 - val_accuracy: 0.9775
Epoch 3948/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1062 - accuracy:
0.9625 - val_loss: 0.0872 - val_accuracy: 0.9825
Epoch 3949/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1039 - accuracy:
0.9631 - val_loss: 0.0782 - val_accuracy: 0.9725
Epoch 3950/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1096 - accuracy:
0.9593 - val_loss: 0.0778 - val_accuracy: 0.9800
Epoch 3951/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1031 - accuracy:
0.9650 - val_loss: 0.1564 - val_accuracy: 0.9225
Epoch 3952/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1382 - accuracy:
0.9387 - val_loss: 0.0853 - val_accuracy: 0.9775
Epoch 3953/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1181 - accuracy:
0.9575 - val_loss: 0.0795 - val_accuracy: 0.9750
Epoch 3954/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1303 - accuracy:
0.9518 - val_loss: 0.1114 - val_accuracy: 0.9425
Epoch 3955/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1655 - accuracy:
0.9312 - val_loss: 0.2270 - val_accuracy: 0.9450
Epoch 3956/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1380 - accuracy:
0.9475 - val_loss: 0.1176 - val_accuracy: 0.9625
Epoch 3957/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1294 - accuracy:
0.9512 - val_loss: 0.0894 - val_accuracy: 0.9825
Epoch 3958/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1080 - accuracy:
0.9593 - val_loss: 0.0927 - val_accuracy: 0.9725
Epoch 3959/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1021 - accuracy:
0.9675 - val_loss: 0.1086 - val_accuracy: 0.9725
```

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Epoch 3960/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1298 - accuracy:
0.9512 - val_loss: 0.0766 - val_accuracy: 0.9825
Epoch 3961/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1051 - accuracy:
0.9612 - val_loss: 0.0827 - val_accuracy: 0.9875
Epoch 3962/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1037 - accuracy:
0.9625 - val_loss: 0.0852 - val_accuracy: 0.9700
Epoch 3963/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1215 - accuracy:
0.9518 - val_loss: 0.0828 - val_accuracy: 0.9650
Epoch 3964/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1086 - accuracy:
0.9556 - val_loss: 0.0733 - val_accuracy: 0.9775
Epoch 3965/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1013 - accuracy:
0.9637 - val_loss: 0.0851 - val_accuracy: 0.9775
Epoch 3966/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1129 - accuracy:
0.9612 - val_loss: 0.1632 - val_accuracy: 0.9250
Epoch 3967/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1741 - accuracy:
0.9262 - val_loss: 0.2808 - val_accuracy: 0.8825
Epoch 3968/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1818 - accuracy:
0.9306 - val_loss: 0.0849 - val_accuracy: 0.9700
Epoch 3969/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1264 - accuracy:
0.9468 - val_loss: 0.1004 - val_accuracy: 0.9725
Epoch 3970/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1153 - accuracy:
0.9587 - val_loss: 0.1163 - val_accuracy: 0.9775
Epoch 3971/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1181 - accuracy:
0.9556 - val_loss: 0.1007 - val_accuracy: 0.9700
Epoch 3972/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1098 - accuracy:
0.9619 - val_loss: 0.0750 - val_accuracy: 0.9850
Epoch 3973/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1078 - accuracy:
0.9625 - val_loss: 0.1013 - val_accuracy: 0.9675
Epoch 3974/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1136 - accuracy:
0.9537 - val_loss: 0.0801 - val_accuracy: 0.9850
Epoch 3975/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1064 - accuracy:
0.9612 - val_loss: 0.0778 - val_accuracy: 0.9875
```

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Epoch 3976/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1094 - accuracy:
0.9606 - val_loss: 0.0803 - val_accuracy: 0.9750
Epoch 3977/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1038 - accuracy:
0.9631 - val_loss: 0.1049 - val_accuracy: 0.9775
Epoch 3978/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1066 - accuracy:
0.9625 - val_loss: 0.0775 - val_accuracy: 0.9825
Epoch 3979/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1115 - accuracy:
0.9593 - val_loss: 0.0760 - val_accuracy: 0.9725
Epoch 3980/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1207 - accuracy:
0.9537 - val_loss: 0.0994 - val_accuracy: 0.9650
Epoch 3981/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1369 - accuracy:
0.9425 - val_loss: 0.1097 - val_accuracy: 0.9600
Epoch 3982/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1406 - accuracy:
0.9487 - val_loss: 0.1165 - val_accuracy: 0.9475
Epoch 3983/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1278 - accuracy:
0.9550 - val_loss: 0.0690 - val_accuracy: 0.9775
Epoch 3984/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1414 - accuracy:
0.9443 - val_loss: 0.1097 - val_accuracy: 0.9550
Epoch 3985/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1770 - accuracy:
0.9337 - val_loss: 0.1726 - val_accuracy: 0.9525
Epoch 3986/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1661 - accuracy:
0.9375 - val_loss: 0.0774 - val_accuracy: 0.9800
Epoch 3987/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1225 - accuracy:
0.9506 - val_loss: 0.1109 - val_accuracy: 0.9625
Epoch 3988/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1273 - accuracy:
0.9543 - val_loss: 0.1824 - val_accuracy: 0.9225
Epoch 3989/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1203 - accuracy:
0.9487 - val_loss: 0.0949 - val_accuracy: 0.9775
Epoch 3990/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1293 - accuracy:
0.9443 - val_loss: 0.0886 - val_accuracy: 0.9750
Epoch 3991/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1213 - accuracy:
0.9537 - val_loss: 0.0772 - val_accuracy: 0.9750
```

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Epoch 3992/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1084 - accuracy:
0.9662 - val_loss: 0.0699 - val_accuracy: 0.9800
Epoch 3993/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1114 - accuracy:
0.9600 - val_loss: 0.0797 - val_accuracy: 0.9850
Epoch 3994/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1084 - accuracy:
0.9631 - val_loss: 0.0933 - val_accuracy: 0.9675
Epoch 3995/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1079 - accuracy:
0.9631 - val_loss: 0.0723 - val_accuracy: 0.9875
Epoch 3996/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1060 - accuracy:
0.9637 - val_loss: 0.0791 - val_accuracy: 0.9775
Epoch 3997/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1057 - accuracy:
0.9619 - val_loss: 0.0767 - val_accuracy: 0.9825
Epoch 3998/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1198 - accuracy:
0.9531 - val_loss: 0.0984 - val_accuracy: 0.9800
Epoch 3999/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1105 - accuracy:
0.9581 - val_loss: 0.0837 - val_accuracy: 0.9850
Epoch 4000/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1076 - accuracy:
0.9637 - val_loss: 0.0752 - val_accuracy: 0.9825
Epoch 4001/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1079 - accuracy:
0.9606 - val_loss: 0.0901 - val_accuracy: 0.9700
Epoch 4002/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1112 - accuracy:
0.9562 - val_loss: 0.1023 - val_accuracy: 0.9725
Epoch 4003/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1168 - accuracy:
0.9575 - val_loss: 0.0734 - val_accuracy: 0.9850
Epoch 4004/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1366 - accuracy:
0.9431 - val_loss: 0.0797 - val_accuracy: 0.9775
Epoch 4005/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1126 - accuracy:
0.9531 - val_loss: 0.0751 - val_accuracy: 0.9850
Epoch 4006/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1044 - accuracy:
0.9625 - val_loss: 0.0850 - val_accuracy: 0.9825
Epoch 4007/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1124 - accuracy:
0.9562 - val_loss: 0.0827 - val_accuracy: 0.9875
```

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Epoch 4008/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1083 - accuracy:
0.9568 - val_loss: 0.0871 - val_accuracy: 0.9725
Epoch 4009/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1099 - accuracy:
0.9606 - val_loss: 0.0707 - val_accuracy: 0.9800
Epoch 4010/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1081 - accuracy:
0.9612 - val_loss: 0.0852 - val_accuracy: 0.9750
Epoch 4011/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1177 - accuracy:
0.9562 - val_loss: 0.0834 - val_accuracy: 0.9875
Epoch 4012/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1081 - accuracy:
0.9619 - val_loss: 0.0839 - val_accuracy: 0.9900
Epoch 4013/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1025 - accuracy:
0.9644 - val_loss: 0.0757 - val_accuracy: 0.9725
Epoch 4014/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1156 - accuracy:
0.9537 - val_loss: 0.0829 - val_accuracy: 0.9850
Epoch 4015/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1138 - accuracy:
0.9619 - val_loss: 0.0686 - val_accuracy: 0.9900
Epoch 4016/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1183 - accuracy:
0.9556 - val_loss: 0.1214 - val_accuracy: 0.9500
Epoch 4017/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1373 - accuracy:
0.9406 - val_loss: 0.0723 - val_accuracy: 0.9825
Epoch 4018/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1155 - accuracy:
0.9556 - val_loss: 0.1190 - val_accuracy: 0.9400
Epoch 4019/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1093 - accuracy:
0.9575 - val_loss: 0.0914 - val_accuracy: 0.9800
Epoch 4020/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1157 - accuracy:
0.9537 - val_loss: 0.0893 - val_accuracy: 0.9575
Epoch 4021/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1193 - accuracy:
0.9581 - val_loss: 0.0963 - val_accuracy: 0.9775
Epoch 4022/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1226 - accuracy:
0.9562 - val_loss: 0.0942 - val_accuracy: 0.9850
Epoch 4023/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1057 - accuracy:
0.9600 - val_loss: 0.0864 - val_accuracy: 0.9675
```

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Epoch 4024/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1166 - accuracy:
0.9550 - val_loss: 0.0800 - val_accuracy: 0.9825
Epoch 4025/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1391 - accuracy:
0.9431 - val_loss: 0.1967 - val_accuracy: 0.9050
Epoch 4026/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1902 - accuracy:
0.9199 - val_loss: 0.1229 - val_accuracy: 0.9525
Epoch 4027/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1352 - accuracy:
0.9462 - val_loss: 0.0940 - val_accuracy: 0.9625
Epoch 4028/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1361 - accuracy:
0.9525 - val_loss: 0.1547 - val_accuracy: 0.9300
Epoch 4029/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1554 - accuracy:
0.9312 - val_loss: 0.0838 - val_accuracy: 0.9825
Epoch 4030/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1176 - accuracy:
0.9568 - val_loss: 0.1653 - val_accuracy: 0.9325
Epoch 4031/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1352 - accuracy:
0.9468 - val_loss: 0.1036 - val_accuracy: 0.9825
Epoch 4032/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1250 - accuracy:
0.9568 - val_loss: 0.1020 - val_accuracy: 0.9675
Epoch 4033/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1191 - accuracy:
0.9543 - val_loss: 0.0731 - val_accuracy: 0.9825
Epoch 4034/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1043 - accuracy:
0.9644 - val_loss: 0.0812 - val_accuracy: 0.9725
Epoch 4035/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1076 - accuracy:
0.9587 - val_loss: 0.0723 - val_accuracy: 0.9850
Epoch 4036/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1074 - accuracy:
0.9612 - val_loss: 0.0750 - val_accuracy: 0.9825
Epoch 4037/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1188 - accuracy:
0.9550 - val_loss: 0.0754 - val_accuracy: 0.9850
Epoch 4038/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1418 - accuracy:
0.9425 - val_loss: 0.1016 - val_accuracy: 0.9600
Epoch 4039/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1429 - accuracy:
0.9512 - val_loss: 0.1041 - val_accuracy: 0.9700
```

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Epoch 4040/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1488 - accuracy:
0.9462 - val_loss: 0.0793 - val_accuracy: 0.9750
Epoch 4041/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1175 - accuracy:
0.9600 - val_loss: 0.1226 - val_accuracy: 0.9475
Epoch 4042/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1344 - accuracy:
0.9568 - val_loss: 0.0859 - val_accuracy: 0.9775
Epoch 4043/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1197 - accuracy:
0.9512 - val_loss: 0.0845 - val_accuracy: 0.9625
Epoch 4044/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1175 - accuracy:
0.9612 - val_loss: 0.0978 - val_accuracy: 0.9850
Epoch 4045/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1008 - accuracy:
0.9650 - val_loss: 0.0797 - val_accuracy: 0.9800
Epoch 4046/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1045 - accuracy:
0.9631 - val_loss: 0.0814 - val_accuracy: 0.9850
Epoch 4047/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1053 - accuracy:
0.9650 - val_loss: 0.0831 - val_accuracy: 0.9750
Epoch 4048/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1114 - accuracy:
0.9600 - val_loss: 0.1117 - val_accuracy: 0.9675
Epoch 4049/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1201 - accuracy:
0.9512 - val_loss: 0.1152 - val_accuracy: 0.9400
Epoch 4050/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1096 - accuracy:
0.9562 - val_loss: 0.0831 - val_accuracy: 0.9675
Epoch 4051/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1074 - accuracy:
0.9612 - val_loss: 0.0759 - val_accuracy: 0.9800
Epoch 4052/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1068 - accuracy:
0.9625 - val_loss: 0.0741 - val_accuracy: 0.9800
Epoch 4053/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1084 - accuracy:
0.9587 - val_loss: 0.1406 - val_accuracy: 0.9350
Epoch 4054/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1351 - accuracy:
0.9512 - val_loss: 0.1149 - val_accuracy: 0.9650
Epoch 4055/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1230 - accuracy:
0.9568 - val_loss: 0.0788 - val_accuracy: 0.9875
```

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Epoch 4056/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1631 - accuracy:
0.9368 - val_loss: 0.1031 - val_accuracy: 0.9700
Epoch 4057/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1427 - accuracy:
0.9437 - val_loss: 0.1090 - val_accuracy: 0.9600
Epoch 4058/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1210 - accuracy:
0.9531 - val_loss: 0.0826 - val_accuracy: 0.9775
Epoch 4059/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1342 - accuracy:
0.9425 - val_loss: 0.0939 - val_accuracy: 0.9725
Epoch 4060/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1502 - accuracy:
0.9387 - val_loss: 0.1018 - val_accuracy: 0.9675
Epoch 4061/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1435 - accuracy:
0.9375 - val_loss: 0.0882 - val_accuracy: 0.9775
Epoch 4062/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1336 - accuracy:
0.9487 - val_loss: 0.1096 - val_accuracy: 0.9500
Epoch 4063/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1208 - accuracy:
0.9487 - val_loss: 0.1156 - val_accuracy: 0.9600
Epoch 4064/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1092 - accuracy:
0.9656 - val_loss: 0.0812 - val_accuracy: 0.9775
Epoch 4065/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1225 - accuracy:
0.9525 - val_loss: 0.1323 - val_accuracy: 0.9500
Epoch 4066/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1333 - accuracy:
0.9437 - val_loss: 0.1187 - val_accuracy: 0.9700
Epoch 4067/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1197 - accuracy:
0.9543 - val_loss: 0.0897 - val_accuracy: 0.9625
Epoch 4068/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1168 - accuracy:
0.9543 - val_loss: 0.0815 - val_accuracy: 0.9825
Epoch 4069/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1172 - accuracy:
0.9556 - val_loss: 0.0743 - val_accuracy: 0.9775
Epoch 4070/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1295 - accuracy:
0.9493 - val_loss: 0.0796 - val_accuracy: 0.9775
Epoch 4071/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1177 - accuracy:
0.9506 - val_loss: 0.0877 - val_accuracy: 0.9775
```

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Epoch 4072/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1220 - accuracy:
0.9531 - val_loss: 0.1279 - val_accuracy: 0.9475
Epoch 4073/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1482 - accuracy:
0.9387 - val_loss: 0.0985 - val_accuracy: 0.9825
Epoch 4074/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1148 - accuracy:
0.9587 - val_loss: 0.0785 - val_accuracy: 0.9875
Epoch 4075/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1140 - accuracy:
0.9600 - val_loss: 0.0938 - val_accuracy: 0.9725
Epoch 4076/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1106 - accuracy:
0.9581 - val_loss: 0.1106 - val_accuracy: 0.9825
Epoch 4077/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1166 - accuracy:
0.9556 - val_loss: 0.1086 - val_accuracy: 0.9625
Epoch 4078/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1174 - accuracy:
0.9568 - val_loss: 0.0775 - val_accuracy: 0.9825
Epoch 4079/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1065 - accuracy:
0.9631 - val_loss: 0.0993 - val_accuracy: 0.9600
Epoch 4080/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1178 - accuracy:
0.9550 - val_loss: 0.1092 - val_accuracy: 0.9825
Epoch 4081/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1161 - accuracy:
0.9556 - val_loss: 0.1182 - val_accuracy: 0.9600
Epoch 4082/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1274 - accuracy:
0.9468 - val_loss: 0.0759 - val_accuracy: 0.9875
Epoch 4083/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1007 - accuracy:
0.9637 - val_loss: 0.0827 - val_accuracy: 0.9800
Epoch 4084/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1056 - accuracy:
0.9625 - val_loss: 0.0755 - val_accuracy: 0.9825
Epoch 4085/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1079 - accuracy:
0.9619 - val_loss: 0.0896 - val_accuracy: 0.9700
Epoch 4086/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1322 - accuracy:
0.9506 - val_loss: 0.1748 - val_accuracy: 0.9325
Epoch 4087/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1358 - accuracy:
0.9450 - val_loss: 0.1289 - val_accuracy: 0.9700
```

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Epoch 4088/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1276 - accuracy:
0.9475 - val_loss: 0.1188 - val_accuracy: 0.9550
Epoch 4089/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1268 - accuracy:
0.9512 - val_loss: 0.0822 - val_accuracy: 0.9725
Epoch 4090/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1191 - accuracy:
0.9518 - val_loss: 0.0834 - val_accuracy: 0.9875
Epoch 4091/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1225 - accuracy:
0.9537 - val_loss: 0.0762 - val_accuracy: 0.9800
Epoch 4092/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1077 - accuracy:
0.9575 - val_loss: 0.0699 - val_accuracy: 0.9850
Epoch 4093/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1075 - accuracy:
0.9612 - val_loss: 0.0787 - val_accuracy: 0.9800
Epoch 4094/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1225 - accuracy:
0.9537 - val_loss: 0.0733 - val_accuracy: 0.9725
Epoch 4095/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1205 - accuracy:
0.9593 - val_loss: 0.0994 - val_accuracy: 0.9600
Epoch 4096/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1226 - accuracy:
0.9525 - val_loss: 0.1013 - val_accuracy: 0.9750
Epoch 4097/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1192 - accuracy:
0.9543 - val_loss: 0.0866 - val_accuracy: 0.9825
Epoch 4098/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1143 - accuracy:
0.9593 - val_loss: 0.0758 - val_accuracy: 0.9875
Epoch 4099/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1168 - accuracy:
0.9593 - val_loss: 0.0763 - val_accuracy: 0.9825
Epoch 4100/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1178 - accuracy:
0.9612 - val_loss: 0.1186 - val_accuracy: 0.9525
Epoch 4101/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1189 - accuracy:
0.9525 - val_loss: 0.1169 - val_accuracy: 0.9525
Epoch 4102/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1118 - accuracy:
0.9575 - val_loss: 0.0753 - val_accuracy: 0.9850
Epoch 4103/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1044 - accuracy:
0.9644 - val_loss: 0.0763 - val_accuracy: 0.9850
```

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Epoch 4104/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1101 - accuracy:
0.9637 - val_loss: 0.1005 - val_accuracy: 0.9600
Epoch 4105/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1201 - accuracy:
0.9575 - val_loss: 0.0777 - val_accuracy: 0.9725
Epoch 4106/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1518 - accuracy:
0.9381 - val_loss: 0.0867 - val_accuracy: 0.9875
Epoch 4107/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1368 - accuracy:
0.9450 - val_loss: 0.0906 - val_accuracy: 0.9700
Epoch 4108/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1122 - accuracy:
0.9600 - val_loss: 0.0937 - val_accuracy: 0.9650
Epoch 4109/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1268 - accuracy:
0.9506 - val_loss: 0.0791 - val_accuracy: 0.9700
Epoch 4110/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1531 - accuracy:
0.9406 - val_loss: 0.1246 - val_accuracy: 0.9600
Epoch 4111/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1100 - accuracy:
0.9619 - val_loss: 0.0900 - val_accuracy: 0.9825
Epoch 4112/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1280 - accuracy:
0.9493 - val_loss: 0.0886 - val_accuracy: 0.9625
Epoch 4113/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1370 - accuracy:
0.9400 - val_loss: 0.0757 - val_accuracy: 0.9725
Epoch 4114/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1060 - accuracy:
0.9625 - val_loss: 0.0992 - val_accuracy: 0.9675
Epoch 4115/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1061 - accuracy:
0.9644 - val_loss: 0.0686 - val_accuracy: 0.9725
Epoch 4116/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1085 - accuracy:
0.9606 - val_loss: 0.1026 - val_accuracy: 0.9800
Epoch 4117/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1194 - accuracy:
0.9568 - val_loss: 0.1342 - val_accuracy: 0.9575
Epoch 4118/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1287 - accuracy:
0.9481 - val_loss: 0.0994 - val_accuracy: 0.9750
Epoch 4119/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1301 - accuracy:
0.9537 - val_loss: 0.0990 - val_accuracy: 0.9700
```

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Epoch 4120/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1322 - accuracy:
0.9550 - val_loss: 0.0771 - val_accuracy: 0.9750
Epoch 4121/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1069 - accuracy:
0.9593 - val_loss: 0.0906 - val_accuracy: 0.9775
Epoch 4122/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1232 - accuracy:
0.9587 - val_loss: 0.1295 - val_accuracy: 0.9700
Epoch 4123/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1108 - accuracy:
0.9575 - val_loss: 0.0751 - val_accuracy: 0.9750
Epoch 4124/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1122 - accuracy:
0.9575 - val_loss: 0.0823 - val_accuracy: 0.9775
Epoch 4125/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1076 - accuracy:
0.9612 - val_loss: 0.1012 - val_accuracy: 0.9825
Epoch 4126/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1087 - accuracy:
0.9631 - val_loss: 0.0800 - val_accuracy: 0.9825
Epoch 4127/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1081 - accuracy:
0.9637 - val_loss: 0.0822 - val_accuracy: 0.9850
Epoch 4128/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1148 - accuracy:
0.9593 - val_loss: 0.0963 - val_accuracy: 0.9850
Epoch 4129/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1371 - accuracy:
0.9462 - val_loss: 0.0914 - val_accuracy: 0.9675
Epoch 4130/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1159 - accuracy:
0.9562 - val_loss: 0.0761 - val_accuracy: 0.9850
Epoch 4131/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1061 - accuracy:
0.9619 - val_loss: 0.0711 - val_accuracy: 0.9825
Epoch 4132/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1096 - accuracy:
0.9550 - val_loss: 0.0726 - val_accuracy: 0.9775
Epoch 4133/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1218 - accuracy:
0.9512 - val_loss: 0.0703 - val_accuracy: 0.9750
Epoch 4134/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1041 - accuracy:
0.9637 - val_loss: 0.0684 - val_accuracy: 0.9850
Epoch 4135/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1042 - accuracy:
0.9631 - val_loss: 0.0892 - val_accuracy: 0.9675
```

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Epoch 4136/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1123 - accuracy:
0.9575 - val_loss: 0.1338 - val_accuracy: 0.9700
Epoch 4137/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1146 - accuracy:
0.9600 - val_loss: 0.1096 - val_accuracy: 0.9400
Epoch 4138/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1179 - accuracy:
0.9518 - val_loss: 0.0853 - val_accuracy: 0.9800
Epoch 4139/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1097 - accuracy:
0.9600 - val_loss: 0.1243 - val_accuracy: 0.9500
Epoch 4140/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1182 - accuracy:
0.9575 - val_loss: 0.0794 - val_accuracy: 0.9800
Epoch 4141/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1174 - accuracy:
0.9593 - val_loss: 0.0788 - val_accuracy: 0.9825
Epoch 4142/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1041 - accuracy:
0.9625 - val_loss: 0.0927 - val_accuracy: 0.9775
Epoch 4143/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1061 - accuracy:
0.9656 - val_loss: 0.0785 - val_accuracy: 0.9725
Epoch 4144/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1093 - accuracy:
0.9587 - val_loss: 0.0943 - val_accuracy: 0.9775
Epoch 4145/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1326 - accuracy:
0.9450 - val_loss: 0.1092 - val_accuracy: 0.9500
Epoch 4146/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1462 - accuracy:
0.9387 - val_loss: 0.1528 - val_accuracy: 0.9325
Epoch 4147/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1322 - accuracy:
0.9487 - val_loss: 0.1181 - val_accuracy: 0.9675
Epoch 4148/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1261 - accuracy:
0.9512 - val_loss: 0.0914 - val_accuracy: 0.9850
Epoch 4149/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1088 - accuracy:
0.9606 - val_loss: 0.0933 - val_accuracy: 0.9775
Epoch 4150/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1114 - accuracy:
0.9568 - val_loss: 0.0959 - val_accuracy: 0.9725
Epoch 4151/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1104 - accuracy:
0.9550 - val_loss: 0.0770 - val_accuracy: 0.9750
```

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Epoch 4152/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1242 - accuracy:
0.9518 - val_loss: 0.0813 - val_accuracy: 0.9800
Epoch 4153/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1322 - accuracy:
0.9425 - val_loss: 0.1096 - val_accuracy: 0.9600
Epoch 4154/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1172 - accuracy:
0.9550 - val_loss: 0.0942 - val_accuracy: 0.9650
Epoch 4155/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1095 - accuracy:
0.9593 - val_loss: 0.1672 - val_accuracy: 0.9200
Epoch 4156/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1207 - accuracy:
0.9531 - val_loss: 0.0789 - val_accuracy: 0.9800
Epoch 4157/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1136 - accuracy:
0.9581 - val_loss: 0.0730 - val_accuracy: 0.9775
Epoch 4158/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1101 - accuracy:
0.9593 - val_loss: 0.0999 - val_accuracy: 0.9650
Epoch 4159/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1476 - accuracy:
0.9412 - val_loss: 0.1234 - val_accuracy: 0.9325
Epoch 4160/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1367 - accuracy:
0.9400 - val_loss: 0.0951 - val_accuracy: 0.9750
Epoch 4161/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1119 - accuracy:
0.9619 - val_loss: 0.0958 - val_accuracy: 0.9600
Epoch 4162/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1450 - accuracy:
0.9387 - val_loss: 0.1162 - val_accuracy: 0.9750
Epoch 4163/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1193 - accuracy:
0.9556 - val_loss: 0.0903 - val_accuracy: 0.9700
Epoch 4164/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1144 - accuracy:
0.9537 - val_loss: 0.0834 - val_accuracy: 0.9725
Epoch 4165/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1126 - accuracy:
0.9568 - val_loss: 0.0846 - val_accuracy: 0.9750
Epoch 4166/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1120 - accuracy:
0.9593 - val_loss: 0.1039 - val_accuracy: 0.9850
Epoch 4167/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1107 - accuracy:
0.9600 - val_loss: 0.0837 - val_accuracy: 0.9725
```

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Epoch 4168/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1273 - accuracy:
0.9500 - val_loss: 0.1064 - val_accuracy: 0.9525
Epoch 4169/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1113 - accuracy:
0.9568 - val_loss: 0.1407 - val_accuracy: 0.9525
Epoch 4170/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1161 - accuracy:
0.9612 - val_loss: 0.0744 - val_accuracy: 0.9850
Epoch 4171/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1035 - accuracy:
0.9650 - val_loss: 0.0816 - val_accuracy: 0.9825
Epoch 4172/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1010 - accuracy:
0.9656 - val_loss: 0.1115 - val_accuracy: 0.9750
Epoch 4173/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1083 - accuracy:
0.9625 - val_loss: 0.0800 - val_accuracy: 0.9725
Epoch 4174/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1035 - accuracy:
0.9619 - val_loss: 0.0891 - val_accuracy: 0.9800
Epoch 4175/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1093 - accuracy:
0.9600 - val_loss: 0.1071 - val_accuracy: 0.9600
Epoch 4176/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1136 - accuracy:
0.9593 - val_loss: 0.1250 - val_accuracy: 0.9625
Epoch 4177/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1170 - accuracy:
0.9550 - val_loss: 0.0780 - val_accuracy: 0.9850
Epoch 4178/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1072 - accuracy:
0.9637 - val_loss: 0.0850 - val_accuracy: 0.9825
Epoch 4179/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1223 - accuracy:
0.9556 - val_loss: 0.2057 - val_accuracy: 0.9200
Epoch 4180/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1387 - accuracy:
0.9400 - val_loss: 0.0908 - val_accuracy: 0.9825
Epoch 4181/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1083 - accuracy:
0.9619 - val_loss: 0.1090 - val_accuracy: 0.9500
Epoch 4182/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1210 - accuracy:
0.9587 - val_loss: 0.0935 - val_accuracy: 0.9675
Epoch 4183/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1163 - accuracy:
0.9537 - val_loss: 0.0763 - val_accuracy: 0.9800
```

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Epoch 4184/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1141 - accuracy:
0.9600 - val_loss: 0.0903 - val_accuracy: 0.9650
Epoch 4185/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1218 - accuracy:
0.9537 - val_loss: 0.1025 - val_accuracy: 0.9475
Epoch 4186/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1389 - accuracy:
0.9443 - val_loss: 0.1467 - val_accuracy: 0.9375
Epoch 4187/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1189 - accuracy:
0.9518 - val_loss: 0.0733 - val_accuracy: 0.9875
Epoch 4188/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1102 - accuracy:
0.9575 - val_loss: 0.0734 - val_accuracy: 0.9750
Epoch 4189/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1085 - accuracy:
0.9637 - val_loss: 0.0806 - val_accuracy: 0.9850
Epoch 4190/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1112 - accuracy:
0.9619 - val_loss: 0.0908 - val_accuracy: 0.9675
Epoch 4191/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1102 - accuracy:
0.9600 - val_loss: 0.0957 - val_accuracy: 0.9825
Epoch 4192/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1083 - accuracy:
0.9575 - val_loss: 0.0711 - val_accuracy: 0.9800
Epoch 4193/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1201 - accuracy:
0.9531 - val_loss: 0.0818 - val_accuracy: 0.9850
Epoch 4194/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1076 - accuracy:
0.9593 - val_loss: 0.0841 - val_accuracy: 0.9800
Epoch 4195/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1158 - accuracy:
0.9568 - val_loss: 0.0800 - val_accuracy: 0.9800
Epoch 4196/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1125 - accuracy:
0.9568 - val_loss: 0.0769 - val_accuracy: 0.9775
Epoch 4197/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1078 - accuracy:
0.9575 - val_loss: 0.0883 - val_accuracy: 0.9775
Epoch 4198/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1212 - accuracy:
0.9600 - val_loss: 0.0785 - val_accuracy: 0.9850
Epoch 4199/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1318 - accuracy:
0.9518 - val_loss: 0.0783 - val_accuracy: 0.9725
```

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Epoch 4200/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1133 - accuracy:
0.9556 - val_loss: 0.0809 - val_accuracy: 0.9750
Epoch 4201/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1112 - accuracy:
0.9575 - val_loss: 0.1074 - val_accuracy: 0.9550
Epoch 4202/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1323 - accuracy:
0.9450 - val_loss: 0.0966 - val_accuracy: 0.9550
Epoch 4203/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1276 - accuracy:
0.9481 - val_loss: 0.0948 - val_accuracy: 0.9775
Epoch 4204/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1205 - accuracy:
0.9525 - val_loss: 0.0877 - val_accuracy: 0.9775
Epoch 4205/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1191 - accuracy:
0.9581 - val_loss: 0.1814 - val_accuracy: 0.9475
Epoch 4206/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1519 - accuracy:
0.9437 - val_loss: 0.0997 - val_accuracy: 0.9725
Epoch 4207/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1548 - accuracy:
0.9287 - val_loss: 0.1205 - val_accuracy: 0.9600
Epoch 4208/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1207 - accuracy:
0.9550 - val_loss: 0.1117 - val_accuracy: 0.9625
Epoch 4209/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1269 - accuracy:
0.9475 - val_loss: 0.1422 - val_accuracy: 0.9375
Epoch 4210/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1289 - accuracy:
0.9418 - val_loss: 0.0841 - val_accuracy: 0.9800
Epoch 4211/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1179 - accuracy:
0.9556 - val_loss: 0.0878 - val_accuracy: 0.9675
Epoch 4212/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1095 - accuracy:
0.9600 - val_loss: 0.0844 - val_accuracy: 0.9875
Epoch 4213/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1007 - accuracy:
0.9644 - val_loss: 0.0752 - val_accuracy: 0.9800
Epoch 4214/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1064 - accuracy:
0.9625 - val_loss: 0.0753 - val_accuracy: 0.9775
Epoch 4215/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1031 - accuracy:
0.9669 - val_loss: 0.0901 - val_accuracy: 0.9675
```

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Epoch 4216/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1166 - accuracy:
0.9525 - val_loss: 0.0709 - val_accuracy: 0.9850
Epoch 4217/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1184 - accuracy:
0.9593 - val_loss: 0.0959 - val_accuracy: 0.9675
Epoch 4218/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1337 - accuracy:
0.9431 - val_loss: 0.0835 - val_accuracy: 0.9650
Epoch 4219/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1105 - accuracy:
0.9581 - val_loss: 0.0770 - val_accuracy: 0.9725
Epoch 4220/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1226 - accuracy:
0.9550 - val_loss: 0.0950 - val_accuracy: 0.9750
Epoch 4221/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1310 - accuracy:
0.9475 - val_loss: 0.0938 - val_accuracy: 0.9700
Epoch 4222/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1110 - accuracy:
0.9587 - val_loss: 0.1230 - val_accuracy: 0.9525
Epoch 4223/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1147 - accuracy:
0.9612 - val_loss: 0.0836 - val_accuracy: 0.9700
Epoch 4224/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1102 - accuracy:
0.9625 - val_loss: 0.1009 - val_accuracy: 0.9700
Epoch 4225/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1123 - accuracy:
0.9619 - val_loss: 0.0909 - val_accuracy: 0.9700
Epoch 4226/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1326 - accuracy:
0.9487 - val_loss: 0.1107 - val_accuracy: 0.9525
Epoch 4227/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1337 - accuracy:
0.9456 - val_loss: 0.0785 - val_accuracy: 0.9775
Epoch 4228/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1222 - accuracy:
0.9500 - val_loss: 0.1045 - val_accuracy: 0.9500
Epoch 4229/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1209 - accuracy:
0.9531 - val_loss: 0.0860 - val_accuracy: 0.9700
Epoch 4230/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1081 - accuracy:
0.9587 - val_loss: 0.0813 - val_accuracy: 0.9825
Epoch 4231/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1211 - accuracy:
0.9568 - val_loss: 0.0854 - val_accuracy: 0.9750
```

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Epoch 4232/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1110 - accuracy:
0.9500 - val_loss: 0.1071 - val_accuracy: 0.9500
Epoch 4233/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1230 - accuracy:
0.9575 - val_loss: 0.0914 - val_accuracy: 0.9825
Epoch 4234/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1092 - accuracy:
0.9587 - val_loss: 0.0783 - val_accuracy: 0.9725
Epoch 4235/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1069 - accuracy:
0.9619 - val_loss: 0.0779 - val_accuracy: 0.9800
Epoch 4236/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1263 - accuracy:
0.9481 - val_loss: 0.1631 - val_accuracy: 0.9300
Epoch 4237/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1293 - accuracy:
0.9493 - val_loss: 0.1251 - val_accuracy: 0.9775
Epoch 4238/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1163 - accuracy:
0.9562 - val_loss: 0.0766 - val_accuracy: 0.9850
Epoch 4239/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1219 - accuracy:
0.9531 - val_loss: 0.1386 - val_accuracy: 0.9425
Epoch 4240/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1427 - accuracy:
0.9368 - val_loss: 0.1166 - val_accuracy: 0.9525
Epoch 4241/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1381 - accuracy:
0.9518 - val_loss: 0.0904 - val_accuracy: 0.9625
Epoch 4242/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1608 - accuracy:
0.9293 - val_loss: 0.1154 - val_accuracy: 0.9625
Epoch 4243/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1299 - accuracy:
0.9487 - val_loss: 0.1216 - val_accuracy: 0.9475
Epoch 4244/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1514 - accuracy:
0.9343 - val_loss: 0.0917 - val_accuracy: 0.9825
Epoch 4245/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1388 - accuracy:
0.9412 - val_loss: 0.1075 - val_accuracy: 0.9825
Epoch 4246/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1182 - accuracy:
0.9600 - val_loss: 0.0698 - val_accuracy: 0.9800
Epoch 4247/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1396 - accuracy:
0.9443 - val_loss: 0.1366 - val_accuracy: 0.9750
```

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Epoch 4248/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1704 - accuracy:
0.9293 - val_loss: 0.2173 - val_accuracy: 0.9150
Epoch 4249/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1502 - accuracy:
0.9418 - val_loss: 0.1294 - val_accuracy: 0.9675
Epoch 4250/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1243 - accuracy:
0.9518 - val_loss: 0.1084 - val_accuracy: 0.9650
Epoch 4251/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1103 - accuracy:
0.9581 - val_loss: 0.0758 - val_accuracy: 0.9825
Epoch 4252/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1016 - accuracy:
0.9644 - val_loss: 0.0985 - val_accuracy: 0.9775
Epoch 4253/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1050 - accuracy:
0.9637 - val_loss: 0.0805 - val_accuracy: 0.9725
Epoch 4254/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1143 - accuracy:
0.9556 - val_loss: 0.0867 - val_accuracy: 0.9725
Epoch 4255/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1065 - accuracy:
0.9612 - val_loss: 0.0754 - val_accuracy: 0.9775
Epoch 4256/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1075 - accuracy:
0.9600 - val_loss: 0.0776 - val_accuracy: 0.9700
Epoch 4257/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1008 - accuracy:
0.9650 - val_loss: 0.0950 - val_accuracy: 0.9625
Epoch 4258/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1123 - accuracy:
0.9575 - val_loss: 0.0793 - val_accuracy: 0.9750
Epoch 4259/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1113 - accuracy:
0.9625 - val_loss: 0.0953 - val_accuracy: 0.9700
Epoch 4260/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1256 - accuracy:
0.9518 - val_loss: 0.1074 - val_accuracy: 0.9550
Epoch 4261/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1324 - accuracy:
0.9481 - val_loss: 0.1515 - val_accuracy: 0.9250
Epoch 4262/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1554 - accuracy:
0.9325 - val_loss: 0.0868 - val_accuracy: 0.9725
Epoch 4263/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1156 - accuracy:
0.9556 - val_loss: 0.0862 - val_accuracy: 0.9775
```

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Epoch 4264/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1089 - accuracy:
0.9631 - val_loss: 0.0917 - val_accuracy: 0.9725
Epoch 4265/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1029 - accuracy:
0.9612 - val_loss: 0.0672 - val_accuracy: 0.9900
Epoch 4266/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1244 - accuracy:
0.9512 - val_loss: 0.1332 - val_accuracy: 0.9550
Epoch 4267/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1426 - accuracy:
0.9393 - val_loss: 0.1203 - val_accuracy: 0.9475
Epoch 4268/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1513 - accuracy:
0.9375 - val_loss: 0.1428 - val_accuracy: 0.9300
Epoch 4269/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1184 - accuracy:
0.9568 - val_loss: 0.0894 - val_accuracy: 0.9775
Epoch 4270/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1128 - accuracy:
0.9587 - val_loss: 0.0761 - val_accuracy: 0.9850
Epoch 4271/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1130 - accuracy:
0.9575 - val_loss: 0.0881 - val_accuracy: 0.9725
Epoch 4272/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1233 - accuracy:
0.9525 - val_loss: 0.0831 - val_accuracy: 0.9725
Epoch 4273/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1105 - accuracy:
0.9625 - val_loss: 0.0845 - val_accuracy: 0.9875
Epoch 4274/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1186 - accuracy:
0.9575 - val_loss: 0.1002 - val_accuracy: 0.9800
Epoch 4275/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1083 - accuracy:
0.9606 - val_loss: 0.0882 - val_accuracy: 0.9700
Epoch 4276/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1050 - accuracy:
0.9625 - val_loss: 0.1379 - val_accuracy: 0.9425
Epoch 4277/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1255 - accuracy:
0.9443 - val_loss: 0.0921 - val_accuracy: 0.9675
Epoch 4278/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1174 - accuracy:
0.9612 - val_loss: 0.0963 - val_accuracy: 0.9550
Epoch 4279/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1463 - accuracy:
0.9462 - val_loss: 0.0861 - val_accuracy: 0.9750
```

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Epoch 4280/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1209 - accuracy:
0.9556 - val_loss: 0.1310 - val_accuracy: 0.9500
Epoch 4281/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1148 - accuracy:
0.9587 - val_loss: 0.0986 - val_accuracy: 0.9700
Epoch 4282/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1101 - accuracy:
0.9575 - val_loss: 0.0889 - val_accuracy: 0.9750
Epoch 4283/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1123 - accuracy:
0.9587 - val_loss: 0.0998 - val_accuracy: 0.9675
Epoch 4284/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1067 - accuracy:
0.9656 - val_loss: 0.0787 - val_accuracy: 0.9750
Epoch 4285/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1019 - accuracy:
0.9637 - val_loss: 0.0950 - val_accuracy: 0.9700
Epoch 4286/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1057 - accuracy:
0.9625 - val_loss: 0.1364 - val_accuracy: 0.9425
Epoch 4287/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1261 - accuracy:
0.9475 - val_loss: 0.1062 - val_accuracy: 0.9600
Epoch 4288/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1233 - accuracy:
0.9493 - val_loss: 0.0792 - val_accuracy: 0.9725
Epoch 4289/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1173 - accuracy:
0.9600 - val_loss: 0.0771 - val_accuracy: 0.9800
Epoch 4290/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1122 - accuracy:
0.9581 - val_loss: 0.0790 - val_accuracy: 0.9875
Epoch 4291/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1116 - accuracy:
0.9562 - val_loss: 0.0825 - val_accuracy: 0.9675
Epoch 4292/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1117 - accuracy:
0.9543 - val_loss: 0.1158 - val_accuracy: 0.9600
Epoch 4293/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1056 - accuracy:
0.9612 - val_loss: 0.0729 - val_accuracy: 0.9775
Epoch 4294/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1200 - accuracy:
0.9525 - val_loss: 0.1122 - val_accuracy: 0.9550
Epoch 4295/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1127 - accuracy:
0.9587 - val_loss: 0.1410 - val_accuracy: 0.9300
```

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Epoch 4296/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1278 - accuracy:
0.9462 - val_loss: 0.0781 - val_accuracy: 0.9725
Epoch 4297/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1110 - accuracy:
0.9575 - val_loss: 0.0729 - val_accuracy: 0.9725
Epoch 4298/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1141 - accuracy:
0.9581 - val_loss: 0.1214 - val_accuracy: 0.9575
Epoch 4299/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1138 - accuracy:
0.9568 - val_loss: 0.0826 - val_accuracy: 0.9875
Epoch 4300/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1199 - accuracy:
0.9512 - val_loss: 0.0761 - val_accuracy: 0.9750
Epoch 4301/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1172 - accuracy:
0.9543 - val_loss: 0.1301 - val_accuracy: 0.9475
Epoch 4302/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1371 - accuracy:
0.9500 - val_loss: 0.0755 - val_accuracy: 0.9800
Epoch 4303/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1146 - accuracy:
0.9531 - val_loss: 0.0825 - val_accuracy: 0.9650
Epoch 4304/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1133 - accuracy:
0.9575 - val_loss: 0.0906 - val_accuracy: 0.9650
Epoch 4305/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1107 - accuracy:
0.9587 - val_loss: 0.1007 - val_accuracy: 0.9650
Epoch 4306/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1102 - accuracy:
0.9581 - val_loss: 0.0789 - val_accuracy: 0.9800
Epoch 4307/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1144 - accuracy:
0.9512 - val_loss: 0.0952 - val_accuracy: 0.9625
Epoch 4308/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1145 - accuracy:
0.9556 - val_loss: 0.0888 - val_accuracy: 0.9800
Epoch 4309/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1038 - accuracy:
0.9619 - val_loss: 0.0842 - val_accuracy: 0.9675
Epoch 4310/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1069 - accuracy:
0.9606 - val_loss: 0.0778 - val_accuracy: 0.9750
Epoch 4311/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1085 - accuracy:
0.9612 - val_loss: 0.0793 - val_accuracy: 0.9725
```

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Epoch 4312/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1135 - accuracy:
0.9550 - val_loss: 0.0901 - val_accuracy: 0.9700
Epoch 4313/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1170 - accuracy:
0.9575 - val_loss: 0.0885 - val_accuracy: 0.9700
Epoch 4314/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1186 - accuracy:
0.9550 - val_loss: 0.1156 - val_accuracy: 0.9450
Epoch 4315/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1366 - accuracy:
0.9456 - val_loss: 0.0852 - val_accuracy: 0.9850
Epoch 4316/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1279 - accuracy:
0.9487 - val_loss: 0.0912 - val_accuracy: 0.9675
Epoch 4317/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1237 - accuracy:
0.9468 - val_loss: 0.1109 - val_accuracy: 0.9500
Epoch 4318/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1388 - accuracy:
0.9450 - val_loss: 0.1093 - val_accuracy: 0.9725
Epoch 4319/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1178 - accuracy:
0.9587 - val_loss: 0.0672 - val_accuracy: 0.9825
Epoch 4320/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1104 - accuracy:
0.9543 - val_loss: 0.0855 - val_accuracy: 0.9725
Epoch 4321/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1113 - accuracy:
0.9631 - val_loss: 0.0874 - val_accuracy: 0.9825
Epoch 4322/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1368 - accuracy:
0.9475 - val_loss: 0.0877 - val_accuracy: 0.9800
Epoch 4323/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1612 - accuracy:
0.9306 - val_loss: 0.1772 - val_accuracy: 0.9275
Epoch 4324/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1555 - accuracy:
0.9337 - val_loss: 0.1071 - val_accuracy: 0.9775
Epoch 4325/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1674 - accuracy:
0.9343 - val_loss: 0.0814 - val_accuracy: 0.9775
Epoch 4326/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1133 - accuracy:
0.9600 - val_loss: 0.0862 - val_accuracy: 0.9700
Epoch 4327/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1119 - accuracy:
0.9593 - val_loss: 0.0824 - val_accuracy: 0.9825
```

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Epoch 4328/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1066 - accuracy:
0.9650 - val_loss: 0.1005 - val_accuracy: 0.9850
Epoch 4329/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1095 - accuracy:
0.9619 - val_loss: 0.0770 - val_accuracy: 0.9750
Epoch 4330/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1103 - accuracy:
0.9606 - val_loss: 0.0722 - val_accuracy: 0.9775
Epoch 4331/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1238 - accuracy:
0.9512 - val_loss: 0.0891 - val_accuracy: 0.9825
Epoch 4332/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1392 - accuracy:
0.9431 - val_loss: 0.1021 - val_accuracy: 0.9675
Epoch 4333/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1231 - accuracy:
0.9525 - val_loss: 0.0739 - val_accuracy: 0.9750
Epoch 4334/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1071 - accuracy:
0.9619 - val_loss: 0.1235 - val_accuracy: 0.9825
Epoch 4335/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1305 - accuracy:
0.9550 - val_loss: 0.0845 - val_accuracy: 0.9725
Epoch 4336/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1139 - accuracy:
0.9581 - val_loss: 0.0729 - val_accuracy: 0.9850
Epoch 4337/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1080 - accuracy:
0.9600 - val_loss: 0.0750 - val_accuracy: 0.9800
Epoch 4338/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1227 - accuracy:
0.9562 - val_loss: 0.0724 - val_accuracy: 0.9800
Epoch 4339/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1052 - accuracy:
0.9650 - val_loss: 0.0843 - val_accuracy: 0.9850
Epoch 4340/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1101 - accuracy:
0.9631 - val_loss: 0.0747 - val_accuracy: 0.9875
Epoch 4341/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1177 - accuracy:
0.9543 - val_loss: 0.0956 - val_accuracy: 0.9650
Epoch 4342/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1085 - accuracy:
0.9581 - val_loss: 0.0781 - val_accuracy: 0.9850
Epoch 4343/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1092 - accuracy:
0.9612 - val_loss: 0.0654 - val_accuracy: 0.9825
```

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Epoch 4344/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1057 - accuracy:
0.9619 - val_loss: 0.1007 - val_accuracy: 0.9625
Epoch 4345/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1399 - accuracy:
0.9443 - val_loss: 0.0796 - val_accuracy: 0.9775
Epoch 4346/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1396 - accuracy:
0.9425 - val_loss: 0.1507 - val_accuracy: 0.9175
Epoch 4347/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1300 - accuracy:
0.9525 - val_loss: 0.1041 - val_accuracy: 0.9550
Epoch 4348/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1076 - accuracy:
0.9587 - val_loss: 0.0794 - val_accuracy: 0.9725
Epoch 4349/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1026 - accuracy:
0.9637 - val_loss: 0.0799 - val_accuracy: 0.9775
Epoch 4350/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1068 - accuracy:
0.9637 - val_loss: 0.0757 - val_accuracy: 0.9775
Epoch 4351/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1053 - accuracy:
0.9619 - val_loss: 0.1007 - val_accuracy: 0.9800
Epoch 4352/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1108 - accuracy:
0.9581 - val_loss: 0.0712 - val_accuracy: 0.9850
Epoch 4353/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1257 - accuracy:
0.9462 - val_loss: 0.1225 - val_accuracy: 0.9575
Epoch 4354/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1295 - accuracy:
0.9468 - val_loss: 0.0815 - val_accuracy: 0.9725
Epoch 4355/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1243 - accuracy:
0.9525 - val_loss: 0.0938 - val_accuracy: 0.9800
Epoch 4356/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1263 - accuracy:
0.9500 - val_loss: 0.1323 - val_accuracy: 0.9650
Epoch 4357/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1176 - accuracy:
0.9606 - val_loss: 0.0803 - val_accuracy: 0.9775
Epoch 4358/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1120 - accuracy:
0.9575 - val_loss: 0.0784 - val_accuracy: 0.9825
Epoch 4359/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1089 - accuracy:
0.9575 - val_loss: 0.0914 - val_accuracy: 0.9800
```

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Epoch 4360/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1169 - accuracy:
0.9568 - val_loss: 0.1041 - val_accuracy: 0.9825
Epoch 4361/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1092 - accuracy:
0.9562 - val_loss: 0.1109 - val_accuracy: 0.9550
Epoch 4362/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1270 - accuracy:
0.9487 - val_loss: 0.1287 - val_accuracy: 0.9400
Epoch 4363/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1200 - accuracy:
0.9581 - val_loss: 0.0881 - val_accuracy: 0.9750
Epoch 4364/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1259 - accuracy:
0.9493 - val_loss: 0.0795 - val_accuracy: 0.9750
Epoch 4365/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1092 - accuracy:
0.9606 - val_loss: 0.0756 - val_accuracy: 0.9775
Epoch 4366/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1222 - accuracy:
0.9443 - val_loss: 0.0922 - val_accuracy: 0.9775
Epoch 4367/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1198 - accuracy:
0.9581 - val_loss: 0.0784 - val_accuracy: 0.9850
Epoch 4368/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1148 - accuracy:
0.9581 - val_loss: 0.1077 - val_accuracy: 0.9675
Epoch 4369/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1072 - accuracy:
0.9656 - val_loss: 0.0934 - val_accuracy: 0.9800
Epoch 4370/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1111 - accuracy:
0.9612 - val_loss: 0.1052 - val_accuracy: 0.9450
Epoch 4371/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1214 - accuracy:
0.9550 - val_loss: 0.1698 - val_accuracy: 0.9175
Epoch 4372/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1351 - accuracy:
0.9393 - val_loss: 0.1078 - val_accuracy: 0.9700
Epoch 4373/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1099 - accuracy:
0.9600 - val_loss: 0.0982 - val_accuracy: 0.9700
Epoch 4374/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1093 - accuracy:
0.9587 - val_loss: 0.0851 - val_accuracy: 0.9825
Epoch 4375/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1151 - accuracy:
0.9593 - val_loss: 0.0735 - val_accuracy: 0.9875
```

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Epoch 4376/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.0996 - accuracy:
0.9656 - val_loss: 0.0746 - val_accuracy: 0.9750
Epoch 4377/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1024 - accuracy:
0.9644 - val_loss: 0.0843 - val_accuracy: 0.9825
Epoch 4378/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1016 - accuracy:
0.9644 - val_loss: 0.0685 - val_accuracy: 0.9825
Epoch 4379/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1033 - accuracy:
0.9631 - val_loss: 0.0704 - val_accuracy: 0.9825
Epoch 4380/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1181 - accuracy:
0.9550 - val_loss: 0.0816 - val_accuracy: 0.9750
Epoch 4381/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1137 - accuracy:
0.9531 - val_loss: 0.0810 - val_accuracy: 0.9850
Epoch 4382/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1079 - accuracy:
0.9619 - val_loss: 0.1008 - val_accuracy: 0.9600
Epoch 4383/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1210 - accuracy:
0.9518 - val_loss: 0.0997 - val_accuracy: 0.9825
Epoch 4384/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1169 - accuracy:
0.9531 - val_loss: 0.0922 - val_accuracy: 0.9675
Epoch 4385/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1107 - accuracy:
0.9568 - val_loss: 0.0810 - val_accuracy: 0.9750
Epoch 4386/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1073 - accuracy:
0.9593 - val_loss: 0.0733 - val_accuracy: 0.9825
Epoch 4387/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1096 - accuracy:
0.9612 - val_loss: 0.0909 - val_accuracy: 0.9725
Epoch 4388/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1183 - accuracy:
0.9581 - val_loss: 0.1103 - val_accuracy: 0.9525
Epoch 4389/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1219 - accuracy:
0.9531 - val_loss: 0.0676 - val_accuracy: 0.9850
Epoch 4390/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1134 - accuracy:
0.9606 - val_loss: 0.0852 - val_accuracy: 0.9675
Epoch 4391/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1355 - accuracy:
0.9493 - val_loss: 0.0874 - val_accuracy: 0.9725
```

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Epoch 4392/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1244 - accuracy:
0.9475 - val_loss: 0.0937 - val_accuracy: 0.9825
Epoch 4393/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1108 - accuracy:
0.9656 - val_loss: 0.1520 - val_accuracy: 0.9375
Epoch 4394/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1386 - accuracy:
0.9406 - val_loss: 0.1566 - val_accuracy: 0.9375
Epoch 4395/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1846 - accuracy:
0.9218 - val_loss: 0.1056 - val_accuracy: 0.9600
Epoch 4396/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1486 - accuracy:
0.9368 - val_loss: 0.0851 - val_accuracy: 0.9750
Epoch 4397/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1185 - accuracy:
0.9525 - val_loss: 0.0792 - val_accuracy: 0.9725
Epoch 4398/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1122 - accuracy:
0.9562 - val_loss: 0.0757 - val_accuracy: 0.9900
Epoch 4399/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1029 - accuracy:
0.9625 - val_loss: 0.0822 - val_accuracy: 0.9775
Epoch 4400/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1249 - accuracy:
0.9468 - val_loss: 0.0934 - val_accuracy: 0.9725
Epoch 4401/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1220 - accuracy:
0.9531 - val_loss: 0.0753 - val_accuracy: 0.9850
Epoch 4402/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1045 - accuracy:
0.9656 - val_loss: 0.0831 - val_accuracy: 0.9850
Epoch 4403/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1102 - accuracy:
0.9556 - val_loss: 0.0934 - val_accuracy: 0.9750
Epoch 4404/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1131 - accuracy:
0.9587 - val_loss: 0.0747 - val_accuracy: 0.9825
Epoch 4405/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1086 - accuracy:
0.9619 - val_loss: 0.0706 - val_accuracy: 0.9825
Epoch 4406/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1035 - accuracy:
0.9637 - val_loss: 0.0882 - val_accuracy: 0.9850
Epoch 4407/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1030 - accuracy:
0.9637 - val_loss: 0.0761 - val_accuracy: 0.9825
```

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Epoch 4408/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1164 - accuracy:
0.9568 - val_loss: 0.0757 - val_accuracy: 0.9825
Epoch 4409/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1153 - accuracy:
0.9562 - val_loss: 0.0748 - val_accuracy: 0.9825
Epoch 4410/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1094 - accuracy:
0.9568 - val_loss: 0.0923 - val_accuracy: 0.9650
Epoch 4411/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1204 - accuracy:
0.9593 - val_loss: 0.0986 - val_accuracy: 0.9775
Epoch 4412/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1146 - accuracy:
0.9581 - val_loss: 0.1007 - val_accuracy: 0.9750
Epoch 4413/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1505 - accuracy:
0.9356 - val_loss: 0.1766 - val_accuracy: 0.9200
Epoch 4414/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1252 - accuracy:
0.9487 - val_loss: 0.0893 - val_accuracy: 0.9750
Epoch 4415/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1075 - accuracy:
0.9600 - val_loss: 0.0882 - val_accuracy: 0.9850
Epoch 4416/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1046 - accuracy:
0.9637 - val_loss: 0.1306 - val_accuracy: 0.9350
Epoch 4417/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1588 - accuracy:
0.9450 - val_loss: 0.0901 - val_accuracy: 0.9800
Epoch 4418/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1293 - accuracy:
0.9506 - val_loss: 0.1260 - val_accuracy: 0.9450
Epoch 4419/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1164 - accuracy:
0.9550 - val_loss: 0.1102 - val_accuracy: 0.9450
Epoch 4420/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1218 - accuracy:
0.9562 - val_loss: 0.0828 - val_accuracy: 0.9775
Epoch 4421/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1178 - accuracy:
0.9581 - val_loss: 0.0874 - val_accuracy: 0.9750
Epoch 4422/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1053 - accuracy:
0.9644 - val_loss: 0.0874 - val_accuracy: 0.9675
Epoch 4423/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1126 - accuracy:
0.9543 - val_loss: 0.0822 - val_accuracy: 0.9800
```

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Epoch 4424/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1197 - accuracy:
0.9568 - val_loss: 0.1075 - val_accuracy: 0.9725
Epoch 4425/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1180 - accuracy:
0.9587 - val_loss: 0.0780 - val_accuracy: 0.9825
Epoch 4426/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1020 - accuracy:
0.9637 - val_loss: 0.0883 - val_accuracy: 0.9775
Epoch 4427/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1099 - accuracy:
0.9600 - val_loss: 0.0970 - val_accuracy: 0.9850
Epoch 4428/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1044 - accuracy:
0.9675 - val_loss: 0.0708 - val_accuracy: 0.9850
Epoch 4429/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1023 - accuracy:
0.9631 - val_loss: 0.1586 - val_accuracy: 0.9275
Epoch 4430/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1219 - accuracy:
0.9525 - val_loss: 0.1049 - val_accuracy: 0.9625
Epoch 4431/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1094 - accuracy:
0.9568 - val_loss: 0.0829 - val_accuracy: 0.9800
Epoch 4432/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1126 - accuracy:
0.9600 - val_loss: 0.0823 - val_accuracy: 0.9725
Epoch 4433/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1613 - accuracy:
0.9281 - val_loss: 0.2998 - val_accuracy: 0.8750
Epoch 4434/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1762 - accuracy:
0.9250 - val_loss: 0.0818 - val_accuracy: 0.9725
Epoch 4435/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1369 - accuracy:
0.9468 - val_loss: 0.0800 - val_accuracy: 0.9900
Epoch 4436/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1116 - accuracy:
0.9587 - val_loss: 0.0759 - val_accuracy: 0.9875
Epoch 4437/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1128 - accuracy:
0.9575 - val_loss: 0.0810 - val_accuracy: 0.9775
Epoch 4438/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1109 - accuracy:
0.9625 - val_loss: 0.1401 - val_accuracy: 0.9375
Epoch 4439/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1346 - accuracy:
0.9493 - val_loss: 0.0956 - val_accuracy: 0.9700
```

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Epoch 4440/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1065 - accuracy:
0.9637 - val_loss: 0.1088 - val_accuracy: 0.9450
Epoch 4441/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1103 - accuracy:
0.9619 - val_loss: 0.1272 - val_accuracy: 0.9575
Epoch 4442/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1210 - accuracy:
0.9562 - val_loss: 0.0900 - val_accuracy: 0.9825
Epoch 4443/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1163 - accuracy:
0.9606 - val_loss: 0.0766 - val_accuracy: 0.9800
Epoch 4444/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1142 - accuracy:
0.9619 - val_loss: 0.0874 - val_accuracy: 0.9750
Epoch 4445/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1076 - accuracy:
0.9600 - val_loss: 0.1072 - val_accuracy: 0.9475
Epoch 4446/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1216 - accuracy:
0.9531 - val_loss: 0.0852 - val_accuracy: 0.9775
Epoch 4447/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1125 - accuracy:
0.9581 - val_loss: 0.0843 - val_accuracy: 0.9875
Epoch 4448/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1099 - accuracy:
0.9612 - val_loss: 0.0889 - val_accuracy: 0.9650
Epoch 4449/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1234 - accuracy:
0.9487 - val_loss: 0.1237 - val_accuracy: 0.9350
Epoch 4450/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1294 - accuracy:
0.9487 - val_loss: 0.0950 - val_accuracy: 0.9825
Epoch 4451/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1155 - accuracy:
0.9625 - val_loss: 0.0773 - val_accuracy: 0.9775
Epoch 4452/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1056 - accuracy:
0.9593 - val_loss: 0.1374 - val_accuracy: 0.9375
Epoch 4453/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1192 - accuracy:
0.9506 - val_loss: 0.1055 - val_accuracy: 0.9600
Epoch 4454/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1164 - accuracy:
0.9543 - val_loss: 0.0921 - val_accuracy: 0.9700
Epoch 4455/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1078 - accuracy:
0.9619 - val_loss: 0.0951 - val_accuracy: 0.9700
```

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Epoch 4456/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1197 - accuracy:
0.9468 - val_loss: 0.0773 - val_accuracy: 0.9875
Epoch 4457/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1169 - accuracy:
0.9568 - val_loss: 0.0917 - val_accuracy: 0.9825
Epoch 4458/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1094 - accuracy:
0.9644 - val_loss: 0.1159 - val_accuracy: 0.9575
Epoch 4459/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1191 - accuracy:
0.9575 - val_loss: 0.0733 - val_accuracy: 0.9825
Epoch 4460/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1116 - accuracy:
0.9619 - val_loss: 0.0822 - val_accuracy: 0.9800
Epoch 4461/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1172 - accuracy:
0.9537 - val_loss: 0.0806 - val_accuracy: 0.9875
Epoch 4462/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1366 - accuracy:
0.9462 - val_loss: 0.0756 - val_accuracy: 0.9750
Epoch 4463/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1238 - accuracy:
0.9556 - val_loss: 0.0846 - val_accuracy: 0.9825
Epoch 4464/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1153 - accuracy:
0.9562 - val_loss: 0.0818 - val_accuracy: 0.9850
Epoch 4465/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1173 - accuracy:
0.9562 - val_loss: 0.0914 - val_accuracy: 0.9750
Epoch 4466/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1203 - accuracy:
0.9500 - val_loss: 0.0918 - val_accuracy: 0.9600
Epoch 4467/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1248 - accuracy:
0.9500 - val_loss: 0.0795 - val_accuracy: 0.9750
Epoch 4468/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1078 - accuracy:
0.9587 - val_loss: 0.0904 - val_accuracy: 0.9825
Epoch 4469/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1112 - accuracy:
0.9593 - val_loss: 0.0885 - val_accuracy: 0.9675
Epoch 4470/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1093 - accuracy:
0.9606 - val_loss: 0.0755 - val_accuracy: 0.9850
Epoch 4471/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1107 - accuracy:
0.9587 - val_loss: 0.0832 - val_accuracy: 0.9700
```

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Epoch 4472/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1094 - accuracy:
0.9612 - val_loss: 0.0757 - val_accuracy: 0.9800
Epoch 4473/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1212 - accuracy:
0.9568 - val_loss: 0.0699 - val_accuracy: 0.9850
Epoch 4474/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1106 - accuracy:
0.9537 - val_loss: 0.0845 - val_accuracy: 0.9850
Epoch 4475/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1048 - accuracy:
0.9631 - val_loss: 0.0732 - val_accuracy: 0.9850
Epoch 4476/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1031 - accuracy:
0.9631 - val_loss: 0.0739 - val_accuracy: 0.9775
Epoch 4477/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1040 - accuracy:
0.9650 - val_loss: 0.0707 - val_accuracy: 0.9875
Epoch 4478/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1023 - accuracy:
0.9619 - val_loss: 0.0769 - val_accuracy: 0.9700
Epoch 4479/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1052 - accuracy:
0.9631 - val_loss: 0.0736 - val_accuracy: 0.9800
Epoch 4480/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1078 - accuracy:
0.9650 - val_loss: 0.0672 - val_accuracy: 0.9825
Epoch 4481/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1103 - accuracy:
0.9593 - val_loss: 0.0751 - val_accuracy: 0.9750
Epoch 4482/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1281 - accuracy:
0.9487 - val_loss: 0.1083 - val_accuracy: 0.9825
Epoch 4483/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1328 - accuracy:
0.9450 - val_loss: 0.0793 - val_accuracy: 0.9675
Epoch 4484/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1194 - accuracy:
0.9543 - val_loss: 0.1038 - val_accuracy: 0.9575
Epoch 4485/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1079 - accuracy:
0.9644 - val_loss: 0.0775 - val_accuracy: 0.9750
Epoch 4486/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1088 - accuracy:
0.9606 - val_loss: 0.1032 - val_accuracy: 0.9625
Epoch 4487/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1454 - accuracy:
0.9431 - val_loss: 0.0999 - val_accuracy: 0.9750
```

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Epoch 4488/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1491 - accuracy:
0.9412 - val_loss: 0.1173 - val_accuracy: 0.9450
Epoch 4489/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1257 - accuracy:
0.9468 - val_loss: 0.1174 - val_accuracy: 0.9400
Epoch 4490/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1229 - accuracy:
0.9556 - val_loss: 0.0800 - val_accuracy: 0.9850
Epoch 4491/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1173 - accuracy:
0.9556 - val_loss: 0.0954 - val_accuracy: 0.9625
Epoch 4492/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1206 - accuracy:
0.9543 - val_loss: 0.1043 - val_accuracy: 0.9600
Epoch 4493/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1046 - accuracy:
0.9625 - val_loss: 0.0893 - val_accuracy: 0.9700
Epoch 4494/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1074 - accuracy:
0.9612 - val_loss: 0.1258 - val_accuracy: 0.9350
Epoch 4495/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1082 - accuracy:
0.9562 - val_loss: 0.0849 - val_accuracy: 0.9750
Epoch 4496/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1039 - accuracy:
0.9681 - val_loss: 0.0914 - val_accuracy: 0.9675
Epoch 4497/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1162 - accuracy:
0.9487 - val_loss: 0.1185 - val_accuracy: 0.9375
Epoch 4498/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1131 - accuracy:
0.9606 - val_loss: 0.0747 - val_accuracy: 0.9750
Epoch 4499/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1113 - accuracy:
0.9562 - val_loss: 0.0864 - val_accuracy: 0.9850
Epoch 4500/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1111 - accuracy:
0.9581 - val_loss: 0.0849 - val_accuracy: 0.9850
Epoch 4501/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1077 - accuracy:
0.9612 - val_loss: 0.1018 - val_accuracy: 0.9800
Epoch 4502/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1167 - accuracy:
0.9593 - val_loss: 0.0942 - val_accuracy: 0.9825
Epoch 4503/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1091 - accuracy:
0.9575 - val_loss: 0.0786 - val_accuracy: 0.9775
```

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Epoch 4504/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1113 - accuracy:
0.9525 - val_loss: 0.1364 - val_accuracy: 0.9300
Epoch 4505/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1405 - accuracy:
0.9393 - val_loss: 0.0898 - val_accuracy: 0.9825
Epoch 4506/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1278 - accuracy:
0.9500 - val_loss: 0.1073 - val_accuracy: 0.9725
Epoch 4507/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1366 - accuracy:
0.9418 - val_loss: 0.0922 - val_accuracy: 0.9675
Epoch 4508/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1386 - accuracy:
0.9506 - val_loss: 0.0792 - val_accuracy: 0.9700
Epoch 4509/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1116 - accuracy:
0.9593 - val_loss: 0.1360 - val_accuracy: 0.9300
Epoch 4510/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1356 - accuracy:
0.9437 - val_loss: 0.1512 - val_accuracy: 0.9275
Epoch 4511/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1428 - accuracy:
0.9325 - val_loss: 0.0803 - val_accuracy: 0.9700
Epoch 4512/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1106 - accuracy:
0.9581 - val_loss: 0.0958 - val_accuracy: 0.9725
Epoch 4513/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1094 - accuracy:
0.9650 - val_loss: 0.1075 - val_accuracy: 0.9775
Epoch 4514/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1212 - accuracy:
0.9500 - val_loss: 0.1249 - val_accuracy: 0.9525
Epoch 4515/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1216 - accuracy:
0.9468 - val_loss: 0.0849 - val_accuracy: 0.9825
Epoch 4516/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1095 - accuracy:
0.9593 - val_loss: 0.1084 - val_accuracy: 0.9725
Epoch 4517/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1683 - accuracy:
0.9243 - val_loss: 0.1700 - val_accuracy: 0.9425
Epoch 4518/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1256 - accuracy:
0.9568 - val_loss: 0.0920 - val_accuracy: 0.9825
Epoch 4519/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1216 - accuracy:
0.9543 - val_loss: 0.0834 - val_accuracy: 0.9800
```

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Epoch 4520/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1153 - accuracy:
0.9581 - val_loss: 0.0799 - val_accuracy: 0.9750
Epoch 4521/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1081 - accuracy:
0.9644 - val_loss: 0.0907 - val_accuracy: 0.9825
Epoch 4522/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1129 - accuracy:
0.9600 - val_loss: 0.0758 - val_accuracy: 0.9775
Epoch 4523/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1190 - accuracy:
0.9537 - val_loss: 0.0807 - val_accuracy: 0.9675
Epoch 4524/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1208 - accuracy:
0.9568 - val_loss: 0.1116 - val_accuracy: 0.9725
Epoch 4525/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1237 - accuracy:
0.9481 - val_loss: 0.0817 - val_accuracy: 0.9750
Epoch 4526/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1234 - accuracy:
0.9512 - val_loss: 0.0787 - val_accuracy: 0.9875
Epoch 4527/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1172 - accuracy:
0.9518 - val_loss: 0.0781 - val_accuracy: 0.9750
Epoch 4528/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1180 - accuracy:
0.9606 - val_loss: 0.0790 - val_accuracy: 0.9750
Epoch 4529/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1067 - accuracy:
0.9593 - val_loss: 0.0932 - val_accuracy: 0.9825
Epoch 4530/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1196 - accuracy:
0.9543 - val_loss: 0.0779 - val_accuracy: 0.9800
Epoch 4531/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1413 - accuracy:
0.9400 - val_loss: 0.0795 - val_accuracy: 0.9700
Epoch 4532/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1057 - accuracy:
0.9619 - val_loss: 0.1381 - val_accuracy: 0.9325
Epoch 4533/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1425 - accuracy:
0.9412 - val_loss: 0.1072 - val_accuracy: 0.9550
Epoch 4534/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1472 - accuracy:
0.9418 - val_loss: 0.0844 - val_accuracy: 0.9750
Epoch 4535/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1309 - accuracy:
0.9506 - val_loss: 0.1064 - val_accuracy: 0.9725
```

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Epoch 4536/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1091 - accuracy:
0.9625 - val_loss: 0.0868 - val_accuracy: 0.9725
Epoch 4537/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1102 - accuracy:
0.9644 - val_loss: 0.0819 - val_accuracy: 0.9725
Epoch 4538/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1150 - accuracy:
0.9556 - val_loss: 0.0843 - val_accuracy: 0.9725
Epoch 4539/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1076 - accuracy:
0.9606 - val_loss: 0.0878 - val_accuracy: 0.9750
Epoch 4540/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1057 - accuracy:
0.9619 - val_loss: 0.0972 - val_accuracy: 0.9525
Epoch 4541/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1228 - accuracy:
0.9531 - val_loss: 0.0945 - val_accuracy: 0.9750
Epoch 4542/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1080 - accuracy:
0.9581 - val_loss: 0.0783 - val_accuracy: 0.9875
Epoch 4543/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1213 - accuracy:
0.9531 - val_loss: 0.0797 - val_accuracy: 0.9700
Epoch 4544/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1181 - accuracy:
0.9568 - val_loss: 0.0758 - val_accuracy: 0.9775
Epoch 4545/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1098 - accuracy:
0.9606 - val_loss: 0.0795 - val_accuracy: 0.9725
Epoch 4546/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1392 - accuracy:
0.9500 - val_loss: 0.0902 - val_accuracy: 0.9725
Epoch 4547/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1227 - accuracy:
0.9562 - val_loss: 0.0774 - val_accuracy: 0.9850
Epoch 4548/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1065 - accuracy:
0.9619 - val_loss: 0.0710 - val_accuracy: 0.9825
Epoch 4549/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1074 - accuracy:
0.9593 - val_loss: 0.0792 - val_accuracy: 0.9725
Epoch 4550/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1132 - accuracy:
0.9550 - val_loss: 0.1019 - val_accuracy: 0.9650
Epoch 4551/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1335 - accuracy:
0.9462 - val_loss: 0.0881 - val_accuracy: 0.9775
```

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Epoch 4552/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1150 - accuracy:
0.9550 - val_loss: 0.0781 - val_accuracy: 0.9850
Epoch 4553/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1088 - accuracy:
0.9575 - val_loss: 0.2026 - val_accuracy: 0.9100
Epoch 4554/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1574 - accuracy:
0.9393 - val_loss: 0.1023 - val_accuracy: 0.9700
Epoch 4555/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1171 - accuracy:
0.9556 - val_loss: 0.0950 - val_accuracy: 0.9825
Epoch 4556/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1124 - accuracy:
0.9606 - val_loss: 0.0787 - val_accuracy: 0.9875
Epoch 4557/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1238 - accuracy:
0.9525 - val_loss: 0.0888 - val_accuracy: 0.9750
Epoch 4558/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1229 - accuracy:
0.9493 - val_loss: 0.0742 - val_accuracy: 0.9825
Epoch 4559/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1103 - accuracy:
0.9637 - val_loss: 0.1049 - val_accuracy: 0.9800
Epoch 4560/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1152 - accuracy:
0.9581 - val_loss: 0.0880 - val_accuracy: 0.9875
Epoch 4561/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1255 - accuracy:
0.9525 - val_loss: 0.1448 - val_accuracy: 0.9425
Epoch 4562/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1464 - accuracy:
0.9343 - val_loss: 0.1502 - val_accuracy: 0.9375
Epoch 4563/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1236 - accuracy:
0.9537 - val_loss: 0.1452 - val_accuracy: 0.9350
Epoch 4564/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1160 - accuracy:
0.9512 - val_loss: 0.0707 - val_accuracy: 0.9800
Epoch 4565/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1100 - accuracy:
0.9612 - val_loss: 0.1332 - val_accuracy: 0.9525
Epoch 4566/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1224 - accuracy:
0.9518 - val_loss: 0.0988 - val_accuracy: 0.9750
Epoch 4567/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1157 - accuracy:
0.9581 - val_loss: 0.1151 - val_accuracy: 0.9500
```

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Epoch 4568/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1283 - accuracy:
0.9437 - val_loss: 0.1072 - val_accuracy: 0.9525
Epoch 4569/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1237 - accuracy:
0.9562 - val_loss: 0.1032 - val_accuracy: 0.9625
Epoch 4570/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1402 - accuracy:
0.9443 - val_loss: 0.0937 - val_accuracy: 0.9825
Epoch 4571/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1328 - accuracy:
0.9481 - val_loss: 0.1157 - val_accuracy: 0.9575
Epoch 4572/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1237 - accuracy:
0.9556 - val_loss: 0.0907 - val_accuracy: 0.9750
Epoch 4573/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1212 - accuracy:
0.9550 - val_loss: 0.0929 - val_accuracy: 0.9700
Epoch 4574/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1121 - accuracy:
0.9568 - val_loss: 0.0892 - val_accuracy: 0.9750
Epoch 4575/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1125 - accuracy:
0.9568 - val_loss: 0.0854 - val_accuracy: 0.9725
Epoch 4576/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1076 - accuracy:
0.9600 - val_loss: 0.0810 - val_accuracy: 0.9875
Epoch 4577/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1046 - accuracy:
0.9637 - val_loss: 0.0869 - val_accuracy: 0.9775
Epoch 4578/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1369 - accuracy:
0.9425 - val_loss: 0.1529 - val_accuracy: 0.9400
Epoch 4579/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1367 - accuracy:
0.9375 - val_loss: 0.1046 - val_accuracy: 0.9700
Epoch 4580/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1123 - accuracy:
0.9612 - val_loss: 0.0797 - val_accuracy: 0.9725
Epoch 4581/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1127 - accuracy:
0.9625 - val_loss: 0.0929 - val_accuracy: 0.9775
Epoch 4582/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1015 - accuracy:
0.9619 - val_loss: 0.0742 - val_accuracy: 0.9750
Epoch 4583/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1045 - accuracy:
0.9650 - val_loss: 0.0758 - val_accuracy: 0.9875
```

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Epoch 4584/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1063 - accuracy:
0.9612 - val_loss: 0.0798 - val_accuracy: 0.9750
Epoch 4585/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1120 - accuracy:
0.9568 - val_loss: 0.1218 - val_accuracy: 0.9750
Epoch 4586/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1142 - accuracy:
0.9543 - val_loss: 0.0941 - val_accuracy: 0.9675
Epoch 4587/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1040 - accuracy:
0.9631 - val_loss: 0.0848 - val_accuracy: 0.9675
Epoch 4588/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1025 - accuracy:
0.9637 - val_loss: 0.0845 - val_accuracy: 0.9775
Epoch 4589/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1157 - accuracy:
0.9644 - val_loss: 0.0873 - val_accuracy: 0.9700
Epoch 4590/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1119 - accuracy:
0.9600 - val_loss: 0.1341 - val_accuracy: 0.9425
Epoch 4591/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1139 - accuracy:
0.9575 - val_loss: 0.0877 - val_accuracy: 0.9850
Epoch 4592/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1145 - accuracy:
0.9543 - val_loss: 0.1082 - val_accuracy: 0.9625
Epoch 4593/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1351 - accuracy:
0.9406 - val_loss: 0.0954 - val_accuracy: 0.9600
Epoch 4594/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1328 - accuracy:
0.9506 - val_loss: 0.1040 - val_accuracy: 0.9625
Epoch 4595/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1388 - accuracy:
0.9431 - val_loss: 0.1017 - val_accuracy: 0.9575
Epoch 4596/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1175 - accuracy:
0.9575 - val_loss: 0.0782 - val_accuracy: 0.9850
Epoch 4597/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1273 - accuracy:
0.9462 - val_loss: 0.1280 - val_accuracy: 0.9375
Epoch 4598/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1198 - accuracy:
0.9462 - val_loss: 0.1000 - val_accuracy: 0.9725
Epoch 4599/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1092 - accuracy:
0.9600 - val_loss: 0.0926 - val_accuracy: 0.9850
```

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Epoch 4600/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1093 - accuracy:
0.9568 - val_loss: 0.0918 - val_accuracy: 0.9625
Epoch 4601/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1078 - accuracy:
0.9606 - val_loss: 0.0836 - val_accuracy: 0.9750
Epoch 4602/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1010 - accuracy:
0.9675 - val_loss: 0.0725 - val_accuracy: 0.9800
Epoch 4603/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1153 - accuracy:
0.9581 - val_loss: 0.0814 - val_accuracy: 0.9750
Epoch 4604/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1303 - accuracy:
0.9543 - val_loss: 0.0926 - val_accuracy: 0.9725
Epoch 4605/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1125 - accuracy:
0.9562 - val_loss: 0.0877 - val_accuracy: 0.9850
Epoch 4606/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1157 - accuracy:
0.9575 - val_loss: 0.0853 - val_accuracy: 0.9725
Epoch 4607/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1270 - accuracy:
0.9493 - val_loss: 0.1136 - val_accuracy: 0.9425
Epoch 4608/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1166 - accuracy:
0.9587 - val_loss: 0.1001 - val_accuracy: 0.9725
Epoch 4609/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1130 - accuracy:
0.9606 - val_loss: 0.1299 - val_accuracy: 0.9425
Epoch 4610/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1118 - accuracy:
0.9531 - val_loss: 0.0941 - val_accuracy: 0.9775
Epoch 4611/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1161 - accuracy:
0.9562 - val_loss: 0.0739 - val_accuracy: 0.9750
Epoch 4612/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1061 - accuracy:
0.9662 - val_loss: 0.0779 - val_accuracy: 0.9825
Epoch 4613/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.0974 - accuracy:
0.9631 - val_loss: 0.0761 - val_accuracy: 0.9725
Epoch 4614/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1057 - accuracy:
0.9619 - val_loss: 0.0826 - val_accuracy: 0.9725
Epoch 4615/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1040 - accuracy:
0.9606 - val_loss: 0.0769 - val_accuracy: 0.9800
```

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Epoch 4616/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1116 - accuracy:
0.9581 - val_loss: 0.0830 - val_accuracy: 0.9775
Epoch 4617/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1047 - accuracy:
0.9662 - val_loss: 0.0859 - val_accuracy: 0.9800
Epoch 4618/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1113 - accuracy:
0.9581 - val_loss: 0.1204 - val_accuracy: 0.9700
Epoch 4619/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1072 - accuracy:
0.9587 - val_loss: 0.0836 - val_accuracy: 0.9825
Epoch 4620/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1056 - accuracy:
0.9637 - val_loss: 0.0837 - val_accuracy: 0.9775
Epoch 4621/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1065 - accuracy:
0.9619 - val_loss: 0.0890 - val_accuracy: 0.9675
Epoch 4622/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1422 - accuracy:
0.9462 - val_loss: 0.1267 - val_accuracy: 0.9625
Epoch 4623/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1282 - accuracy:
0.9506 - val_loss: 0.0925 - val_accuracy: 0.9800
Epoch 4624/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1109 - accuracy:
0.9568 - val_loss: 0.0985 - val_accuracy: 0.9775
Epoch 4625/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1041 - accuracy:
0.9631 - val_loss: 0.0800 - val_accuracy: 0.9825
Epoch 4626/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1065 - accuracy:
0.9625 - val_loss: 0.0716 - val_accuracy: 0.9825
Epoch 4627/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1086 - accuracy:
0.9587 - val_loss: 0.0694 - val_accuracy: 0.9825
Epoch 4628/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1212 - accuracy:
0.9606 - val_loss: 0.0939 - val_accuracy: 0.9600
Epoch 4629/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1190 - accuracy:
0.9531 - val_loss: 0.0723 - val_accuracy: 0.9775
Epoch 4630/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1083 - accuracy:
0.9593 - val_loss: 0.0695 - val_accuracy: 0.9750
Epoch 4631/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1089 - accuracy:
0.9600 - val_loss: 0.0806 - val_accuracy: 0.9800
```

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Epoch 4632/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1131 - accuracy:
0.9606 - val_loss: 0.0811 - val_accuracy: 0.9675
Epoch 4633/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1208 - accuracy:
0.9525 - val_loss: 0.0824 - val_accuracy: 0.9725
Epoch 4634/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1245 - accuracy:
0.9525 - val_loss: 0.0851 - val_accuracy: 0.9725
Epoch 4635/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1125 - accuracy:
0.9556 - val_loss: 0.0864 - val_accuracy: 0.9775
Epoch 4636/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1092 - accuracy:
0.9600 - val_loss: 0.1052 - val_accuracy: 0.9575
Epoch 4637/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1367 - accuracy:
0.9437 - val_loss: 0.1139 - val_accuracy: 0.9625
Epoch 4638/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1098 - accuracy:
0.9568 - val_loss: 0.0891 - val_accuracy: 0.9825
Epoch 4639/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1054 - accuracy:
0.9625 - val_loss: 0.0955 - val_accuracy: 0.9675
Epoch 4640/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1217 - accuracy:
0.9468 - val_loss: 0.1064 - val_accuracy: 0.9650
Epoch 4641/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1268 - accuracy:
0.9437 - val_loss: 0.1802 - val_accuracy: 0.9350
Epoch 4642/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1171 - accuracy:
0.9568 - val_loss: 0.0666 - val_accuracy: 0.9900
Epoch 4643/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1119 - accuracy:
0.9550 - val_loss: 0.0908 - val_accuracy: 0.9675
Epoch 4644/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1081 - accuracy:
0.9556 - val_loss: 0.1371 - val_accuracy: 0.9725
Epoch 4645/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1167 - accuracy:
0.9593 - val_loss: 0.0961 - val_accuracy: 0.9750
Epoch 4646/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1159 - accuracy:
0.9568 - val_loss: 0.1305 - val_accuracy: 0.9475
Epoch 4647/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1288 - accuracy:
0.9487 - val_loss: 0.0913 - val_accuracy: 0.9725
```

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Epoch 4648/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1441 - accuracy:
0.9418 - val_loss: 0.1046 - val_accuracy: 0.9650
Epoch 4649/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1308 - accuracy:
0.9437 - val_loss: 0.0893 - val_accuracy: 0.9725
Epoch 4650/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1142 - accuracy:
0.9525 - val_loss: 0.1273 - val_accuracy: 0.9750
Epoch 4651/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1427 - accuracy:
0.9368 - val_loss: 0.1261 - val_accuracy: 0.9500
Epoch 4652/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1170 - accuracy:
0.9518 - val_loss: 0.0892 - val_accuracy: 0.9725
Epoch 4653/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1384 - accuracy:
0.9443 - val_loss: 0.1010 - val_accuracy: 0.9775
Epoch 4654/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1272 - accuracy:
0.9537 - val_loss: 0.0734 - val_accuracy: 0.9725
Epoch 4655/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1089 - accuracy:
0.9606 - val_loss: 0.0853 - val_accuracy: 0.9625
Epoch 4656/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1149 - accuracy:
0.9562 - val_loss: 0.0855 - val_accuracy: 0.9775
Epoch 4657/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1343 - accuracy:
0.9431 - val_loss: 0.1173 - val_accuracy: 0.9425
Epoch 4658/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1331 - accuracy:
0.9475 - val_loss: 0.1104 - val_accuracy: 0.9450
Epoch 4659/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1426 - accuracy:
0.9437 - val_loss: 0.0867 - val_accuracy: 0.9725
Epoch 4660/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1131 - accuracy:
0.9568 - val_loss: 0.1385 - val_accuracy: 0.9775
Epoch 4661/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1138 - accuracy:
0.9550 - val_loss: 0.1091 - val_accuracy: 0.9650
Epoch 4662/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1097 - accuracy:
0.9581 - val_loss: 0.0967 - val_accuracy: 0.9625
Epoch 4663/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1077 - accuracy:
0.9606 - val_loss: 0.1007 - val_accuracy: 0.9625
```

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Epoch 4664/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1129 - accuracy:
0.9543 - val_loss: 0.0776 - val_accuracy: 0.9750
Epoch 4665/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1126 - accuracy:
0.9600 - val_loss: 0.1472 - val_accuracy: 0.9800
Epoch 4666/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1070 - accuracy:
0.9662 - val_loss: 0.1334 - val_accuracy: 0.9675
Epoch 4667/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1170 - accuracy:
0.9581 - val_loss: 0.1164 - val_accuracy: 0.9650
Epoch 4668/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1269 - accuracy:
0.9450 - val_loss: 0.0819 - val_accuracy: 0.9850
Epoch 4669/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1044 - accuracy:
0.9625 - val_loss: 0.0809 - val_accuracy: 0.9750
Epoch 4670/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1051 - accuracy:
0.9681 - val_loss: 0.0742 - val_accuracy: 0.9750
Epoch 4671/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1047 - accuracy:
0.9637 - val_loss: 0.0728 - val_accuracy: 0.9800
Epoch 4672/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1202 - accuracy:
0.9562 - val_loss: 0.2141 - val_accuracy: 0.9100
Epoch 4673/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1403 - accuracy:
0.9456 - val_loss: 0.0737 - val_accuracy: 0.9750
Epoch 4674/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1287 - accuracy:
0.9443 - val_loss: 0.1012 - val_accuracy: 0.9800
Epoch 4675/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1107 - accuracy:
0.9600 - val_loss: 0.1082 - val_accuracy: 0.9650
Epoch 4676/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1197 - accuracy:
0.9550 - val_loss: 0.0811 - val_accuracy: 0.9775
Epoch 4677/5000
13/13 [==============================] - 0s 17ms/step - loss: 0.1152 - accuracy:
0.9600 - val_loss: 0.0817 - val_accuracy: 0.9750
Epoch 4678/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1103 - accuracy:
0.9625 - val_loss: 0.0837 - val_accuracy: 0.9875
Epoch 4679/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1096 - accuracy:
0.9600 - val_loss: 0.0760 - val_accuracy: 0.9750
```

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Epoch 4680/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1007 - accuracy:
0.9662 - val_loss: 0.0874 - val_accuracy: 0.9725
Epoch 4681/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1060 - accuracy:
0.9656 - val_loss: 0.0916 - val_accuracy: 0.9675
Epoch 4682/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1076 - accuracy:
0.9587 - val_loss: 0.0938 - val_accuracy: 0.9825
Epoch 4683/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1264 - accuracy:
0.9512 - val_loss: 0.0933 - val_accuracy: 0.9775
Epoch 4684/5000
13/13 [==============================] - 0s 17ms/step - loss: 0.1176 - accuracy:
0.9556 - val_loss: 0.0923 - val_accuracy: 0.9675
Epoch 4685/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1134 - accuracy:
0.9593 - val_loss: 0.0920 - val_accuracy: 0.9725
Epoch 4686/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1011 - accuracy:
0.9631 - val_loss: 0.0682 - val_accuracy: 0.9800
Epoch 4687/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1007 - accuracy:
0.9600 - val_loss: 0.0811 - val_accuracy: 0.9750
Epoch 4688/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1039 - accuracy:
0.9600 - val_loss: 0.0728 - val_accuracy: 0.9875
Epoch 4689/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1174 - accuracy:
0.9568 - val_loss: 0.0723 - val_accuracy: 0.9825
Epoch 4690/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1051 - accuracy:
0.9606 - val_loss: 0.0741 - val_accuracy: 0.9850
Epoch 4691/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1042 - accuracy:
0.9637 - val_loss: 0.1149 - val_accuracy: 0.9600
Epoch 4692/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1127 - accuracy:
0.9556 - val_loss: 0.0794 - val_accuracy: 0.9625
Epoch 4693/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1154 - accuracy:
0.9575 - val_loss: 0.0893 - val_accuracy: 0.9825
Epoch 4694/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1082 - accuracy:
0.9550 - val_loss: 0.0841 - val_accuracy: 0.9650
Epoch 4695/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1224 - accuracy:
0.9493 - val_loss: 0.0899 - val_accuracy: 0.9725
```

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Epoch 4696/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1106 - accuracy:
0.9600 - val_loss: 0.0880 - val_accuracy: 0.9875
Epoch 4697/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1019 - accuracy:
0.9619 - val_loss: 0.0895 - val_accuracy: 0.9650
Epoch 4698/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.0984 - accuracy:
0.9637 - val_loss: 0.0695 - val_accuracy: 0.9750
Epoch 4699/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1016 - accuracy:
0.9644 - val_loss: 0.0794 - val_accuracy: 0.9850
Epoch 4700/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1025 - accuracy:
0.9669 - val_loss: 0.0694 - val_accuracy: 0.9825
Epoch 4701/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1048 - accuracy:
0.9625 - val_loss: 0.1158 - val_accuracy: 0.9525
Epoch 4702/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1196 - accuracy:
0.9550 - val_loss: 0.0863 - val_accuracy: 0.9875
Epoch 4703/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1073 - accuracy:
0.9581 - val_loss: 0.0808 - val_accuracy: 0.9775
Epoch 4704/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.0996 - accuracy:
0.9644 - val_loss: 0.0808 - val_accuracy: 0.9825
Epoch 4705/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1072 - accuracy:
0.9606 - val_loss: 0.0741 - val_accuracy: 0.9825
Epoch 4706/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1058 - accuracy:
0.9581 - val_loss: 0.0995 - val_accuracy: 0.9450
Epoch 4707/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1169 - accuracy:
0.9550 - val_loss: 0.0724 - val_accuracy: 0.9800
Epoch 4708/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1054 - accuracy:
0.9625 - val_loss: 0.0782 - val_accuracy: 0.9775
Epoch 4709/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1053 - accuracy:
0.9600 - val_loss: 0.0679 - val_accuracy: 0.9800
Epoch 4710/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1290 - accuracy:
0.9531 - val_loss: 0.0899 - val_accuracy: 0.9650
Epoch 4711/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1237 - accuracy:
0.9537 - val_loss: 0.1724 - val_accuracy: 0.9500
```

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Epoch 4712/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.2219 - accuracy:
0.9312 - val_loss: 0.0831 - val_accuracy: 0.9700
Epoch 4713/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1650 - accuracy:
0.9350 - val_loss: 0.1288 - val_accuracy: 0.9500
Epoch 4714/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.2318 - accuracy:
0.9287 - val_loss: 0.1002 - val_accuracy: 0.9675
Epoch 4715/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1352 - accuracy:
0.9437 - val_loss: 0.0866 - val_accuracy: 0.9750
Epoch 4716/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1155 - accuracy:
0.9581 - val_loss: 0.0893 - val_accuracy: 0.9725
Epoch 4717/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1166 - accuracy:
0.9525 - val_loss: 0.0878 - val_accuracy: 0.9675
Epoch 4718/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1326 - accuracy:
0.9468 - val_loss: 0.0813 - val_accuracy: 0.9825
Epoch 4719/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1363 - accuracy:
0.9456 - val_loss: 0.1114 - val_accuracy: 0.9550
Epoch 4720/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1252 - accuracy:
0.9531 - val_loss: 0.1173 - val_accuracy: 0.9775
Epoch 4721/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1059 - accuracy:
0.9625 - val_loss: 0.0845 - val_accuracy: 0.9800
Epoch 4722/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1154 - accuracy:
0.9506 - val_loss: 0.1042 - val_accuracy: 0.9475
Epoch 4723/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1565 - accuracy:
0.9406 - val_loss: 0.1197 - val_accuracy: 0.9500
Epoch 4724/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1768 - accuracy:
0.9312 - val_loss: 0.1041 - val_accuracy: 0.9625
Epoch 4725/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1106 - accuracy:
0.9612 - val_loss: 0.1158 - val_accuracy: 0.9650
Epoch 4726/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1113 - accuracy:
0.9575 - val_loss: 0.0840 - val_accuracy: 0.9750
Epoch 4727/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1166 - accuracy:
0.9550 - val_loss: 0.0992 - val_accuracy: 0.9700
```

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Epoch 4728/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1550 - accuracy:
0.9325 - val_loss: 0.1347 - val_accuracy: 0.9350
Epoch 4729/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1184 - accuracy:
0.9556 - val_loss: 0.0841 - val_accuracy: 0.9650
Epoch 4730/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1164 - accuracy:
0.9575 - val_loss: 0.0968 - val_accuracy: 0.9650
Epoch 4731/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1221 - accuracy:
0.9537 - val_loss: 0.0780 - val_accuracy: 0.9850
Epoch 4732/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1143 - accuracy:
0.9556 - val_loss: 0.0801 - val_accuracy: 0.9700
Epoch 4733/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1083 - accuracy:
0.9637 - val_loss: 0.1183 - val_accuracy: 0.9750
Epoch 4734/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1134 - accuracy:
0.9631 - val_loss: 0.0948 - val_accuracy: 0.9675
Epoch 4735/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1015 - accuracy:
0.9612 - val_loss: 0.0992 - val_accuracy: 0.9625
Epoch 4736/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1059 - accuracy:
0.9625 - val_loss: 0.0749 - val_accuracy: 0.9825
Epoch 4737/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1049 - accuracy:
0.9612 - val_loss: 0.0830 - val_accuracy: 0.9675
Epoch 4738/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1062 - accuracy:
0.9581 - val_loss: 0.0829 - val_accuracy: 0.9675
Epoch 4739/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1129 - accuracy:
0.9556 - val_loss: 0.1012 - val_accuracy: 0.9775
Epoch 4740/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1203 - accuracy:
0.9518 - val_loss: 0.0732 - val_accuracy: 0.9750
Epoch 4741/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1225 - accuracy:
0.9512 - val_loss: 0.0962 - val_accuracy: 0.9700
Epoch 4742/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1058 - accuracy:
0.9650 - val_loss: 0.0905 - val_accuracy: 0.9800
Epoch 4743/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1046 - accuracy:
0.9631 - val_loss: 0.0915 - val_accuracy: 0.9625
```

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Epoch 4744/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1061 - accuracy:
0.9612 - val_loss: 0.1160 - val_accuracy: 0.9600
Epoch 4745/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1039 - accuracy:
0.9606 - val_loss: 0.0696 - val_accuracy: 0.9900
Epoch 4746/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1121 - accuracy:
0.9593 - val_loss: 0.1040 - val_accuracy: 0.9675
Epoch 4747/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1315 - accuracy:
0.9437 - val_loss: 0.1218 - val_accuracy: 0.9625
Epoch 4748/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1243 - accuracy:
0.9468 - val_loss: 0.0941 - val_accuracy: 0.9650
Epoch 4749/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1078 - accuracy:
0.9600 - val_loss: 0.1213 - val_accuracy: 0.9800
Epoch 4750/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1093 - accuracy:
0.9612 - val_loss: 0.0979 - val_accuracy: 0.9825
Epoch 4751/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1032 - accuracy:
0.9637 - val_loss: 0.0809 - val_accuracy: 0.9750
Epoch 4752/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1028 - accuracy:
0.9637 - val_loss: 0.0780 - val_accuracy: 0.9775
Epoch 4753/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1142 - accuracy:
0.9531 - val_loss: 0.0989 - val_accuracy: 0.9700
Epoch 4754/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1212 - accuracy:
0.9556 - val_loss: 0.1194 - val_accuracy: 0.9400
Epoch 4755/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1463 - accuracy:
0.9406 - val_loss: 0.0998 - val_accuracy: 0.9650
Epoch 4756/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1201 - accuracy:
0.9487 - val_loss: 0.1337 - val_accuracy: 0.9650
Epoch 4757/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1138 - accuracy:
0.9606 - val_loss: 0.1110 - val_accuracy: 0.9450
Epoch 4758/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1353 - accuracy:
0.9381 - val_loss: 0.0950 - val_accuracy: 0.9675
Epoch 4759/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1339 - accuracy:
0.9500 - val_loss: 0.0777 - val_accuracy: 0.9750
```

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Epoch 4760/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1117 - accuracy:
0.9612 - val_loss: 0.0974 - val_accuracy: 0.9825
Epoch 4761/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1052 - accuracy:
0.9606 - val_loss: 0.0665 - val_accuracy: 0.9850
Epoch 4762/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1016 - accuracy:
0.9650 - val_loss: 0.0665 - val_accuracy: 0.9875
Epoch 4763/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1053 - accuracy:
0.9644 - val_loss: 0.0965 - val_accuracy: 0.9600
Epoch 4764/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1158 - accuracy:
0.9500 - val_loss: 0.0920 - val_accuracy: 0.9675
Epoch 4765/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1335 - accuracy:
0.9468 - val_loss: 0.1036 - val_accuracy: 0.9800
Epoch 4766/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1494 - accuracy:
0.9350 - val_loss: 0.1322 - val_accuracy: 0.9450
Epoch 4767/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1427 - accuracy:
0.9431 - val_loss: 0.1066 - val_accuracy: 0.9675
Epoch 4768/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1066 - accuracy:
0.9656 - val_loss: 0.1036 - val_accuracy: 0.9625
Epoch 4769/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1092 - accuracy:
0.9606 - val_loss: 0.0924 - val_accuracy: 0.9700
Epoch 4770/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1089 - accuracy:
0.9568 - val_loss: 0.0903 - val_accuracy: 0.9700
Epoch 4771/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1000 - accuracy:
0.9650 - val_loss: 0.0812 - val_accuracy: 0.9825
Epoch 4772/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.0991 - accuracy:
0.9637 - val_loss: 0.0835 - val_accuracy: 0.9800
Epoch 4773/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1103 - accuracy:
0.9575 - val_loss: 0.1185 - val_accuracy: 0.9575
Epoch 4774/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1168 - accuracy:
0.9531 - val_loss: 0.0861 - val_accuracy: 0.9800
Epoch 4775/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1068 - accuracy:
0.9631 - val_loss: 0.0757 - val_accuracy: 0.9800
```

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Epoch 4776/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1052 - accuracy:
0.9625 - val_loss: 0.0754 - val_accuracy: 0.9800
Epoch 4777/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1080 - accuracy:
0.9606 - val_loss: 0.0978 - val_accuracy: 0.9800
Epoch 4778/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1078 - accuracy:
0.9587 - val_loss: 0.0977 - val_accuracy: 0.9650
Epoch 4779/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1087 - accuracy:
0.9600 - val_loss: 0.0847 - val_accuracy: 0.9825
Epoch 4780/5000
13/13 [==============================] - 0s 8ms/step - loss: 0.1072 - accuracy:
0.9612 - val_loss: 0.0967 - val_accuracy: 0.9700
Epoch 4781/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1155 - accuracy:
0.9593 - val_loss: 0.0864 - val_accuracy: 0.9725
Epoch 4782/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1095 - accuracy:
0.9593 - val_loss: 0.1032 - val_accuracy: 0.9525
Epoch 4783/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1180 - accuracy:
0.9506 - val_loss: 0.0880 - val_accuracy: 0.9675
Epoch 4784/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1210 - accuracy:
0.9493 - val_loss: 0.1366 - val_accuracy: 0.9525
Epoch 4785/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1089 - accuracy:
0.9612 - val_loss: 0.0770 - val_accuracy: 0.9775
Epoch 4786/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1146 - accuracy:
0.9550 - val_loss: 0.0866 - val_accuracy: 0.9800
Epoch 4787/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1119 - accuracy:
0.9568 - val_loss: 0.0799 - val_accuracy: 0.9875
Epoch 4788/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1026 - accuracy:
0.9619 - val_loss: 0.2352 - val_accuracy: 0.9025
Epoch 4789/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1722 - accuracy:
0.9243 - val_loss: 0.0812 - val_accuracy: 0.9775
Epoch 4790/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1416 - accuracy:
0.9418 - val_loss: 0.1037 - val_accuracy: 0.9625
Epoch 4791/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1174 - accuracy:
0.9531 - val_loss: 0.0814 - val_accuracy: 0.9850
```

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Epoch 4792/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1209 - accuracy:
0.9512 - val_loss: 0.0753 - val_accuracy: 0.9750
Epoch 4793/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1597 - accuracy:
0.9325 - val_loss: 0.1177 - val_accuracy: 0.9775
Epoch 4794/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1583 - accuracy:
0.9350 - val_loss: 0.1629 - val_accuracy: 0.9575
Epoch 4795/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1698 - accuracy:
0.9300 - val_loss: 0.1622 - val_accuracy: 0.9150
Epoch 4796/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1988 - accuracy:
0.9087 - val_loss: 0.1250 - val_accuracy: 0.9400
Epoch 4797/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1291 - accuracy:
0.9518 - val_loss: 0.1099 - val_accuracy: 0.9775
Epoch 4798/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1247 - accuracy:
0.9556 - val_loss: 0.0788 - val_accuracy: 0.9800
Epoch 4799/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1214 - accuracy:
0.9562 - val_loss: 0.0854 - val_accuracy: 0.9700
Epoch 4800/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1157 - accuracy:
0.9556 - val_loss: 0.0993 - val_accuracy: 0.9800
Epoch 4801/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1279 - accuracy:
0.9512 - val_loss: 0.1462 - val_accuracy: 0.9425
Epoch 4802/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1339 - accuracy:
0.9425 - val_loss: 0.0933 - val_accuracy: 0.9675
Epoch 4803/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1120 - accuracy:
0.9550 - val_loss: 0.0800 - val_accuracy: 0.9825
Epoch 4804/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1089 - accuracy:
0.9619 - val_loss: 0.0878 - val_accuracy: 0.9650
Epoch 4805/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1091 - accuracy:
0.9587 - val_loss: 0.0862 - val_accuracy: 0.9825
Epoch 4806/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1163 - accuracy:
0.9506 - val_loss: 0.0802 - val_accuracy: 0.9725
Epoch 4807/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1233 - accuracy:
0.9556 - val_loss: 0.0944 - val_accuracy: 0.9800
```

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Epoch 4808/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1123 - accuracy:
0.9612 - val_loss: 0.0784 - val_accuracy: 0.9750
Epoch 4809/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1090 - accuracy:
0.9587 - val_loss: 0.0964 - val_accuracy: 0.9675
Epoch 4810/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1190 - accuracy:
0.9550 - val_loss: 0.0878 - val_accuracy: 0.9800
Epoch 4811/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1304 - accuracy:
0.9475 - val_loss: 0.0787 - val_accuracy: 0.9775
Epoch 4812/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1260 - accuracy:
0.9462 - val_loss: 0.1399 - val_accuracy: 0.9450
Epoch 4813/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1235 - accuracy:
0.9525 - val_loss: 0.1203 - val_accuracy: 0.9700
Epoch 4814/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1083 - accuracy:
0.9619 - val_loss: 0.0775 - val_accuracy: 0.9825
Epoch 4815/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1071 - accuracy:
0.9637 - val_loss: 0.0909 - val_accuracy: 0.9700
Epoch 4816/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1123 - accuracy:
0.9587 - val_loss: 0.1002 - val_accuracy: 0.9800
Epoch 4817/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1053 - accuracy:
0.9612 - val_loss: 0.0784 - val_accuracy: 0.9725
Epoch 4818/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1027 - accuracy:
0.9650 - val_loss: 0.0853 - val_accuracy: 0.9750
Epoch 4819/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1029 - accuracy:
0.9612 - val_loss: 0.0820 - val_accuracy: 0.9850
Epoch 4820/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1064 - accuracy:
0.9625 - val_loss: 0.0855 - val_accuracy: 0.9750
Epoch 4821/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1042 - accuracy:
0.9625 - val_loss: 0.0811 - val_accuracy: 0.9800
Epoch 4822/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1006 - accuracy:
0.9694 - val_loss: 0.0883 - val_accuracy: 0.9875
Epoch 4823/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1046 - accuracy:
0.9625 - val_loss: 0.1381 - val_accuracy: 0.9400
```

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Epoch 4824/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1180 - accuracy:
0.9556 - val_loss: 0.0805 - val_accuracy: 0.9850
Epoch 4825/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1105 - accuracy:
0.9593 - val_loss: 0.1088 - val_accuracy: 0.9675
Epoch 4826/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1104 - accuracy:
0.9593 - val_loss: 0.0943 - val_accuracy: 0.9800
Epoch 4827/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1099 - accuracy:
0.9593 - val_loss: 0.1548 - val_accuracy: 0.9125
Epoch 4828/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1346 - accuracy:
0.9406 - val_loss: 0.1115 - val_accuracy: 0.9650
Epoch 4829/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1324 - accuracy:
0.9468 - val_loss: 0.1445 - val_accuracy: 0.9325
Epoch 4830/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1259 - accuracy:
0.9481 - val_loss: 0.0868 - val_accuracy: 0.9850
Epoch 4831/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1141 - accuracy:
0.9562 - val_loss: 0.0686 - val_accuracy: 0.9800
Epoch 4832/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1114 - accuracy:
0.9631 - val_loss: 0.1009 - val_accuracy: 0.9825
Epoch 4833/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1049 - accuracy:
0.9625 - val_loss: 0.0940 - val_accuracy: 0.9675
Epoch 4834/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1370 - accuracy:
0.9537 - val_loss: 0.1000 - val_accuracy: 0.9675
Epoch 4835/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1220 - accuracy:
0.9543 - val_loss: 0.0842 - val_accuracy: 0.9800
Epoch 4836/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1158 - accuracy:
0.9550 - val_loss: 0.1071 - val_accuracy: 0.9725
Epoch 4837/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1078 - accuracy:
0.9587 - val_loss: 0.0969 - val_accuracy: 0.9650
Epoch 4838/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1066 - accuracy:
0.9593 - val_loss: 0.0827 - val_accuracy: 0.9800
Epoch 4839/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1106 - accuracy:
0.9606 - val_loss: 0.1165 - val_accuracy: 0.9350
```

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Epoch 4840/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1122 - accuracy:
0.9593 - val_loss: 0.0913 - val_accuracy: 0.9675
Epoch 4841/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1194 - accuracy:
0.9518 - val_loss: 0.1064 - val_accuracy: 0.9825
Epoch 4842/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1141 - accuracy:
0.9587 - val_loss: 0.0808 - val_accuracy: 0.9750
Epoch 4843/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1169 - accuracy:
0.9487 - val_loss: 0.0726 - val_accuracy: 0.9800
Epoch 4844/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1149 - accuracy:
0.9581 - val_loss: 0.0963 - val_accuracy: 0.9875
Epoch 4845/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1065 - accuracy:
0.9619 - val_loss: 0.1033 - val_accuracy: 0.9725
Epoch 4846/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1095 - accuracy:
0.9587 - val_loss: 0.1738 - val_accuracy: 0.9225
Epoch 4847/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1211 - accuracy:
0.9481 - val_loss: 0.0813 - val_accuracy: 0.9750
Epoch 4848/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1415 - accuracy:
0.9493 - val_loss: 0.0945 - val_accuracy: 0.9725
Epoch 4849/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1307 - accuracy:
0.9487 - val_loss: 0.0793 - val_accuracy: 0.9800
Epoch 4850/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1313 - accuracy:
0.9487 - val_loss: 0.0965 - val_accuracy: 0.9725
Epoch 4851/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1218 - accuracy:
0.9500 - val_loss: 0.1070 - val_accuracy: 0.9575
Epoch 4852/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1166 - accuracy:
0.9556 - val_loss: 0.0922 - val_accuracy: 0.9800
Epoch 4853/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1143 - accuracy:
0.9581 - val_loss: 0.1170 - val_accuracy: 0.9575
Epoch 4854/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1172 - accuracy:
0.9562 - val_loss: 0.1103 - val_accuracy: 0.9750
Epoch 4855/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1059 - accuracy:
0.9625 - val_loss: 0.0821 - val_accuracy: 0.9750
```

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Epoch 4856/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1046 - accuracy:
0.9606 - val_loss: 0.0889 - val_accuracy: 0.9750
Epoch 4857/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1027 - accuracy:
0.9593 - val_loss: 0.0860 - val_accuracy: 0.9700
Epoch 4858/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1023 - accuracy:
0.9650 - val_loss: 0.1561 - val_accuracy: 0.9350
Epoch 4859/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1290 - accuracy:
0.9487 - val_loss: 0.0979 - val_accuracy: 0.9700
Epoch 4860/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1140 - accuracy:
0.9587 - val_loss: 0.0850 - val_accuracy: 0.9850
Epoch 4861/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1068 - accuracy:
0.9568 - val_loss: 0.0894 - val_accuracy: 0.9700
Epoch 4862/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1110 - accuracy:
0.9587 - val_loss: 0.0874 - val_accuracy: 0.9700
Epoch 4863/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1051 - accuracy:
0.9600 - val_loss: 0.0818 - val_accuracy: 0.9825
Epoch 4864/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1112 - accuracy:
0.9600 - val_loss: 0.0945 - val_accuracy: 0.9775
Epoch 4865/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1137 - accuracy:
0.9543 - val_loss: 0.0881 - val_accuracy: 0.9825
Epoch 4866/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1114 - accuracy:
0.9562 - val_loss: 0.0782 - val_accuracy: 0.9700
Epoch 4867/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1087 - accuracy:
0.9619 - val_loss: 0.1010 - val_accuracy: 0.9600
Epoch 4868/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1111 - accuracy:
0.9581 - val_loss: 0.0792 - val_accuracy: 0.9825
Epoch 4869/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.0995 - accuracy:
0.9662 - val_loss: 0.0826 - val_accuracy: 0.9800
Epoch 4870/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.0953 - accuracy:
0.9637 - val_loss: 0.0806 - val_accuracy: 0.9800
Epoch 4871/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.0993 - accuracy:
0.9631 - val_loss: 0.1109 - val_accuracy: 0.9550
```

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Epoch 4872/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1067 - accuracy:
0.9625 - val_loss: 0.0906 - val_accuracy: 0.9725
Epoch 4873/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1418 - accuracy:
0.9393 - val_loss: 0.0986 - val_accuracy: 0.9625
Epoch 4874/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1174 - accuracy:
0.9500 - val_loss: 0.0872 - val_accuracy: 0.9750
Epoch 4875/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1260 - accuracy:
0.9412 - val_loss: 0.1432 - val_accuracy: 0.9425
Epoch 4876/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1268 - accuracy:
0.9475 - val_loss: 0.1247 - val_accuracy: 0.9525
Epoch 4877/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1283 - accuracy:
0.9543 - val_loss: 0.0853 - val_accuracy: 0.9775
Epoch 4878/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1072 - accuracy:
0.9581 - val_loss: 0.0833 - val_accuracy: 0.9825
Epoch 4879/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1013 - accuracy:
0.9650 - val_loss: 0.0782 - val_accuracy: 0.9850
Epoch 4880/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1065 - accuracy:
0.9587 - val_loss: 0.0930 - val_accuracy: 0.9800
Epoch 4881/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1223 - accuracy:
0.9525 - val_loss: 0.0722 - val_accuracy: 0.9750
Epoch 4882/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1066 - accuracy:
0.9644 - val_loss: 0.0793 - val_accuracy: 0.9825
Epoch 4883/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1082 - accuracy:
0.9631 - val_loss: 0.1933 - val_accuracy: 0.9200
Epoch 4884/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1485 - accuracy:
0.9393 - val_loss: 0.1227 - val_accuracy: 0.9525
Epoch 4885/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1511 - accuracy:
0.9362 - val_loss: 0.1302 - val_accuracy: 0.9525
Epoch 4886/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1411 - accuracy:
0.9481 - val_loss: 0.1855 - val_accuracy: 0.9175
Epoch 4887/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1679 - accuracy:
0.9231 - val_loss: 0.0763 - val_accuracy: 0.9825
```

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Epoch 4888/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1513 - accuracy:
0.9318 - val_loss: 0.1101 - val_accuracy: 0.9675
Epoch 4889/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1166 - accuracy:
0.9537 - val_loss: 0.1227 - val_accuracy: 0.9650
Epoch 4890/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1255 - accuracy:
0.9500 - val_loss: 0.1116 - val_accuracy: 0.9825
Epoch 4891/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1294 - accuracy:
0.9475 - val_loss: 0.0823 - val_accuracy: 0.9800
Epoch 4892/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1100 - accuracy:
0.9587 - val_loss: 0.0979 - val_accuracy: 0.9750
Epoch 4893/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1145 - accuracy:
0.9581 - val_loss: 0.0834 - val_accuracy: 0.9750
Epoch 4894/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1142 - accuracy:
0.9518 - val_loss: 0.0711 - val_accuracy: 0.9825
Epoch 4895/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1081 - accuracy:
0.9600 - val_loss: 0.0878 - val_accuracy: 0.9800
Epoch 4896/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1029 - accuracy:
0.9625 - val_loss: 0.0800 - val_accuracy: 0.9750
Epoch 4897/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1078 - accuracy:
0.9593 - val_loss: 0.0892 - val_accuracy: 0.9800
Epoch 4898/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1036 - accuracy:
0.9637 - val_loss: 0.0968 - val_accuracy: 0.9725
Epoch 4899/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1053 - accuracy:
0.9637 - val_loss: 0.0738 - val_accuracy: 0.9750
Epoch 4900/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.0995 - accuracy:
0.9637 - val_loss: 0.0700 - val_accuracy: 0.9825
Epoch 4901/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1014 - accuracy:
0.9662 - val_loss: 0.0949 - val_accuracy: 0.9800
Epoch 4902/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.0974 - accuracy:
0.9650 - val_loss: 0.0708 - val_accuracy: 0.9775
Epoch 4903/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.0990 - accuracy:
0.9650 - val_loss: 0.0787 - val_accuracy: 0.9725
```

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Epoch 4904/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1226 - accuracy:
0.9468 - val_loss: 0.1096 - val_accuracy: 0.9500
Epoch 4905/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1373 - accuracy:
0.9481 - val_loss: 0.0748 - val_accuracy: 0.9825
Epoch 4906/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1189 - accuracy:
0.9531 - val_loss: 0.0765 - val_accuracy: 0.9750
Epoch 4907/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1505 - accuracy:
0.9387 - val_loss: 0.0797 - val_accuracy: 0.9750
Epoch 4908/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1300 - accuracy:
0.9543 - val_loss: 0.1341 - val_accuracy: 0.9500
Epoch 4909/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1139 - accuracy:
0.9593 - val_loss: 0.0993 - val_accuracy: 0.9675
Epoch 4910/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1203 - accuracy:
0.9556 - val_loss: 0.1088 - val_accuracy: 0.9650
Epoch 4911/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1095 - accuracy:
0.9593 - val_loss: 0.0770 - val_accuracy: 0.9775
Epoch 4912/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1028 - accuracy:
0.9625 - val_loss: 0.0803 - val_accuracy: 0.9825
Epoch 4913/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1080 - accuracy:
0.9606 - val_loss: 0.0852 - val_accuracy: 0.9750
Epoch 4914/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1203 - accuracy:
0.9562 - val_loss: 0.0762 - val_accuracy: 0.9675
Epoch 4915/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.0993 - accuracy:
0.9593 - val_loss: 0.0771 - val_accuracy: 0.9750
Epoch 4916/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1041 - accuracy:
0.9606 - val_loss: 0.0789 - val_accuracy: 0.9825
Epoch 4917/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1024 - accuracy:
0.9631 - val_loss: 0.1638 - val_accuracy: 0.9325
Epoch 4918/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1395 - accuracy:
0.9431 - val_loss: 0.0822 - val_accuracy: 0.9775
Epoch 4919/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1647 - accuracy:
0.9343 - val_loss: 0.1347 - val_accuracy: 0.9350
```

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Epoch 4920/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1896 - accuracy:
0.9281 - val_loss: 0.1072 - val_accuracy: 0.9675
Epoch 4921/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1422 - accuracy:
0.9418 - val_loss: 0.1152 - val_accuracy: 0.9600
Epoch 4922/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1123 - accuracy:
0.9543 - val_loss: 0.0756 - val_accuracy: 0.9850
Epoch 4923/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1057 - accuracy:
0.9593 - val_loss: 0.0793 - val_accuracy: 0.9800
Epoch 4924/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1012 - accuracy:
0.9631 - val_loss: 0.1083 - val_accuracy: 0.9800
Epoch 4925/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1038 - accuracy:
0.9631 - val_loss: 0.0866 - val_accuracy: 0.9800
Epoch 4926/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1225 - accuracy:
0.9587 - val_loss: 0.1112 - val_accuracy: 0.9525
Epoch 4927/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1192 - accuracy:
0.9537 - val_loss: 0.1010 - val_accuracy: 0.9625
Epoch 4928/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1473 - accuracy:
0.9412 - val_loss: 0.1036 - val_accuracy: 0.9800
Epoch 4929/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1334 - accuracy:
0.9543 - val_loss: 0.0736 - val_accuracy: 0.9800
Epoch 4930/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1120 - accuracy:
0.9550 - val_loss: 0.0922 - val_accuracy: 0.9825
Epoch 4931/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1195 - accuracy:
0.9537 - val_loss: 0.1160 - val_accuracy: 0.9500
Epoch 4932/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1247 - accuracy:
0.9525 - val_loss: 0.1716 - val_accuracy: 0.9175
Epoch 4933/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1242 - accuracy:
0.9512 - val_loss: 0.1558 - val_accuracy: 0.9425
Epoch 4934/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1381 - accuracy:
0.9493 - val_loss: 0.0865 - val_accuracy: 0.9750
Epoch 4935/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1173 - accuracy:
0.9575 - val_loss: 0.0851 - val_accuracy: 0.9725
```

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Epoch 4936/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1132 - accuracy:
0.9606 - val_loss: 0.0836 - val_accuracy: 0.9775
Epoch 4937/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1116 - accuracy:
0.9568 - val_loss: 0.0934 - val_accuracy: 0.9700
Epoch 4938/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1073 - accuracy:
0.9644 - val_loss: 0.0881 - val_accuracy: 0.9750
Epoch 4939/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1027 - accuracy:
0.9637 - val_loss: 0.1035 - val_accuracy: 0.9625
Epoch 4940/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1104 - accuracy:
0.9587 - val_loss: 0.0900 - val_accuracy: 0.9750
Epoch 4941/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1046 - accuracy:
0.9656 - val_loss: 0.1053 - val_accuracy: 0.9800
Epoch 4942/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.0999 - accuracy:
0.9656 - val_loss: 0.0878 - val_accuracy: 0.9825
Epoch 4943/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1111 - accuracy:
0.9543 - val_loss: 0.0978 - val_accuracy: 0.9750
Epoch 4944/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1043 - accuracy:
0.9625 - val_loss: 0.0746 - val_accuracy: 0.9750
Epoch 4945/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1326 - accuracy:
0.9406 - val_loss: 0.0950 - val_accuracy: 0.9675
Epoch 4946/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1145 - accuracy:
0.9581 - val_loss: 0.0704 - val_accuracy: 0.9775
Epoch 4947/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1096 - accuracy:
0.9600 - val_loss: 0.1394 - val_accuracy: 0.9350
Epoch 4948/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1448 - accuracy:
0.9375 - val_loss: 0.1312 - val_accuracy: 0.9575
Epoch 4949/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1325 - accuracy:
0.9481 - val_loss: 0.0812 - val_accuracy: 0.9850
Epoch 4950/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1105 - accuracy:
0.9581 - val_loss: 0.1161 - val_accuracy: 0.9625
Epoch 4951/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1205 - accuracy:
0.9531 - val_loss: 0.0770 - val_accuracy: 0.9725
```

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Epoch 4952/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1076 - accuracy:
0.9593 - val_loss: 0.0786 - val_accuracy: 0.9875
Epoch 4953/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1096 - accuracy:
0.9600 - val_loss: 0.0840 - val_accuracy: 0.9700
Epoch 4954/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1080 - accuracy:
0.9606 - val_loss: 0.0818 - val_accuracy: 0.9800
Epoch 4955/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1028 - accuracy:
0.9625 - val_loss: 0.1134 - val_accuracy: 0.9400
Epoch 4956/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1086 - accuracy:
0.9593 - val_loss: 0.0810 - val_accuracy: 0.9675
Epoch 4957/5000
13/13 [==============================] - 0s 15ms/step - loss: 0.1062 - accuracy:
0.9625 - val_loss: 0.0917 - val_accuracy: 0.9675
Epoch 4958/5000
13/13 [==============================] - 0s 16ms/step - loss: 0.1165 - accuracy:
0.9500 - val_loss: 0.1416 - val_accuracy: 0.9325
Epoch 4959/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1355 - accuracy:
0.9443 - val_loss: 0.0887 - val_accuracy: 0.9675
Epoch 4960/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1182 - accuracy:
0.9568 - val_loss: 0.0808 - val_accuracy: 0.9800
Epoch 4961/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1126 - accuracy:
0.9600 - val_loss: 0.0805 - val_accuracy: 0.9725
Epoch 4962/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1059 - accuracy:
0.9644 - val_loss: 0.0818 - val_accuracy: 0.9800
Epoch 4963/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1023 - accuracy:
0.9606 - val_loss: 0.0819 - val_accuracy: 0.9775
Epoch 4964/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1093 - accuracy:
0.9606 - val_loss: 0.0808 - val_accuracy: 0.9750
Epoch 4965/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1187 - accuracy:
0.9525 - val_loss: 0.1186 - val_accuracy: 0.9775
Epoch 4966/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1142 - accuracy:
0.9593 - val_loss: 0.0822 - val_accuracy: 0.9775
Epoch 4967/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1019 - accuracy:
0.9637 - val_loss: 0.0760 - val_accuracy: 0.9825
```

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Epoch 4968/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.0999 - accuracy:
0.9687 - val_loss: 0.0804 - val_accuracy: 0.9750
Epoch 4969/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1062 - accuracy:
0.9612 - val_loss: 0.0880 - val_accuracy: 0.9850
Epoch 4970/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1164 - accuracy:
0.9531 - val_loss: 0.1011 - val_accuracy: 0.9700
Epoch 4971/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1220 - accuracy:
0.9500 - val_loss: 0.1291 - val_accuracy: 0.9425
Epoch 4972/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1480 - accuracy:
0.9393 - val_loss: 0.1526 - val_accuracy: 0.9225
Epoch 4973/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1284 - accuracy:
0.9487 - val_loss: 0.1002 - val_accuracy: 0.9600
Epoch 4974/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1173 - accuracy:
0.9543 - val_loss: 0.0832 - val_accuracy: 0.9750
Epoch 4975/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1029 - accuracy:
0.9625 - val_loss: 0.0679 - val_accuracy: 0.9850
Epoch 4976/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1051 - accuracy:
0.9631 - val_loss: 0.1129 - val_accuracy: 0.9600
Epoch 4977/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1392 - accuracy:
0.9443 - val_loss: 0.1089 - val_accuracy: 0.9825
Epoch 4978/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1452 - accuracy:
0.9406 - val_loss: 0.0880 - val_accuracy: 0.9725
Epoch 4979/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1346 - accuracy:
0.9500 - val_loss: 0.1144 - val_accuracy: 0.9450
Epoch 4980/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1374 - accuracy:
0.9468 - val_loss: 0.1202 - val_accuracy: 0.9550
Epoch 4981/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1211 - accuracy:
0.9593 - val_loss: 0.0828 - val_accuracy: 0.9775
Epoch 4982/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1058 - accuracy:
0.9612 - val_loss: 0.0785 - val_accuracy: 0.9825
Epoch 4983/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1683 - accuracy:
0.9199 - val_loss: 0.1763 - val_accuracy: 0.9125
```

```
Epoch 4984/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1495 - accuracy:
0.9318 - val_loss: 0.1015 - val_accuracy: 0.9600
Epoch 4985/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1337 - accuracy:
0.9450 - val_loss: 0.0904 - val_accuracy: 0.9725
Epoch 4986/5000
13/13 [==============================] - 0s 13ms/step - loss: 0.1186 - accuracy:
0.9631 - val_loss: 0.1374 - val_accuracy: 0.9650
Epoch 4987/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1088 - accuracy:
0.9612 - val_loss: 0.0727 - val_accuracy: 0.9850
Epoch 4988/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1029 - accuracy:
0.9631 - val_loss: 0.0765 - val_accuracy: 0.9825
Epoch 4989/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1025 - accuracy:
0.9606 - val_loss: 0.0898 - val_accuracy: 0.9850
Epoch 4990/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1233 - accuracy:
0.9531 - val_loss: 0.0927 - val_accuracy: 0.9700
Epoch 4991/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1132 - accuracy:
0.9537 - val_loss: 0.0765 - val_accuracy: 0.9800
Epoch 4992/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1069 - accuracy:
0.9600 - val_loss: 0.0973 - val_accuracy: 0.9675
Epoch 4993/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1060 - accuracy:
0.9606 - val_loss: 0.0861 - val_accuracy: 0.9775
Epoch 4994/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1087 - accuracy:
0.9593 - val_loss: 0.0863 - val_accuracy: 0.9800
Epoch 4995/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1007 - accuracy:
0.9644 - val_loss: 0.0797 - val_accuracy: 0.9825
Epoch 4996/5000
13/13 [==============================] - 0s 9ms/step - loss: 0.1272 - accuracy:
0.9443 - val_loss: 0.1015 - val_accuracy: 0.9625
Epoch 4997/5000
13/13 [==============================] - 0s 10ms/step - loss: 0.1050 - accuracy:
0.9631 - val_loss: 0.0750 - val_accuracy: 0.9750
Epoch 4998/5000
13/13 [==============================] - 0s 14ms/step - loss: 0.1128 - accuracy:
0.9568 - val_loss: 0.0746 - val_accuracy: 0.9875
Epoch 4999/5000
13/13 [==============================] - 0s 12ms/step - loss: 0.1029 - accuracy:
0.9637 - val_loss: 0.0865 - val_accuracy: 0.9850
```

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Epoch 5000/5000
13/13 [==============================] - 0s 11ms/step - loss: 0.1113 - accuracy:
0.9556 - val_loss: 0.0863 - val_accuracy: 0.9700
13/13 [==============================] - 0s 5ms/step - loss: 0.0863 - accuracy:
0.9700
Test loss: 0.08631286770105362
Test accuracy: 0.9700000286102295
```

[8]:
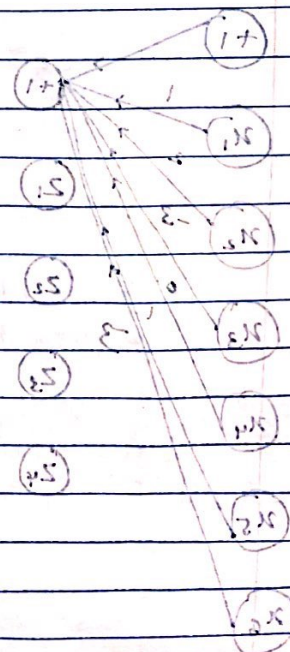
2. (a) $E_{TOTAL} : \sum \frac{1}{2}(y - \hat{y})^2$

$$\frac{\partial E_{TOTAL}}{\partial w_5} = \frac{\partial E_{TOTAL}}{\partial Y_{1,out}} \times \frac{\partial Y_{1,out}}{\partial Y_1} \times \frac{\partial Y_1}{\partial w_5}$$

$\Rightarrow$ ∂E_{TOTAL}

$Y_{1,out} = Z$

$Y_1 = $

$$\frac{\partial Loss}{\partial \beta_{2,1}} = \frac{\partial L}{\partial \hat{y}_2} \times \frac{\partial \hat{y}_2}{\partial b_2} \times \frac{\partial b_2}{\partial \beta_{2,1}}$$

$\Rightarrow$ $\frac{\partial}{\partial \hat{y}_2}\left[-y \log \hat{y}_1 - y_2 \log \hat{y}_2 - y_3 \log \hat{y}_3 \right] \times \frac{\partial}{\partial b_2}\left[\frac{\exp(b_2)}{(\exp(b_1) + \exp(b_2) + \exp(b_3))} \right]$

$$+ \frac{\partial}{\partial \beta_{2,1}}\left[b_0 + \sum_{j=1}^{4} \beta_{j,i} Z_j \right]$$

$$= \frac{-y_2}{\hat{y}_2} \cdot \frac{\exp(b_2)(\exp(b_1) + \exp(b_2) + \exp(b_3)) - (\exp(b_2))^2}{(\exp(b_1) + \exp(b_2) + \exp(b_3))^2} \times Z_1$$

$\Rightarrow$ $\frac{-y_2}{\hat{y}_2} \times \frac{\exp(b_2)(\exp(b_1) + \exp(b_3))}{(\exp(b_1) + \exp(b_2) + \exp(b_3))^2} \times Z_1$

$= +0.3686 \quad -0.65045$

$\beta_{2,1} = \beta_{31} - \varepsilon \frac{\partial L}{\partial \beta_{2,1}} = 1 - 1(-0.3686)$ $1 + 0.65045$

$= 1.3686$ $= 1.65045$

(b) $1.7384 \Rightarrow 1 - \left(\frac{-y_2}{\hat{y}_2} \frac{\exp(b_2)(\exp(b_1) + \exp(b_3))}{(\exp(b_1) + \exp(b_2) + \exp(b_3))^2} \right)$

2.

(c) $\dfrac{\partial L}{\partial \alpha_{3,4}} = \dfrac{\partial L}{\partial \hat{y}_1} \times \dfrac{\partial \hat{y}_1}{\partial b_1} \times \dfrac{\partial b_1}{\partial z_3} \times \dfrac{\partial z_3}{\partial \alpha_3} \times \dfrac{\partial \alpha_3}{\partial \alpha_{3,4}}$

$+$

$\dfrac{\partial L}{\partial \hat{y}_2} \times \dfrac{\partial \hat{y}_2}{\partial b_2} \times \dfrac{\partial b_2}{\partial z_3} \times \dfrac{\partial z_3}{\partial \alpha_3} \times \dfrac{\partial \alpha_3}{\partial \alpha_{3,4}}$

$+$

$\dfrac{\partial L}{\partial \hat{y}_3} \times \dfrac{\partial \hat{y}_3}{\partial b_3} \times \dfrac{\partial b_3}{\partial z_3} \times \dfrac{\partial z_3}{\partial \alpha_3} \times \dfrac{\partial \alpha_3}{\partial \alpha_{3,4}}$

$\alpha_{3,4} = \alpha_{3,4} - \eta \left[\dfrac{\partial L}{\partial \alpha_{3,4}} \right]$

(d) $\alpha_{2,0} = \alpha_{2,0} - \eta \left[\dfrac{\partial L}{\partial \alpha_{2,0}} \right]$

$=$