# Implementing a Neural Network

In this exercise we will develop a neural network with fully-connected layers to perform a regression task and a classification task. You need to implement two classes, `DenseLayer` and `Feedforward`, and the `train` function `in implementation.py`

In [78]:

```
# A bit of setup

import numpy as np
import tensorflow as tf
import matplotlib.pyplot as plt

#need to have these two lines to work on my PC
#  https://stackoverflow.com/questions/43990046/tensorflow-blas-gemm-launch-failed
physical_devices = tf.config.list_physical_devices('GPU')
tf.config.experimental.set_memory_growth(physical_devices[0], True)

%matplotlib inline
plt.rcParams['figure.figsize'] = (10.0, 8.0) # set default size of plots
plt.rcParams['image.interpolation'] = 'nearest'
plt.rcParams['image.cmap'] = 'gray'

# for auto-reloading external modules
# see http://stackoverflow.com/questions/1907993/autoreload-of-modules-in-ipython
%load_ext autoreload
%autoreload 2
%autosave 60
```

```
The autoreload extension is already loaded. To reload it, use:
  %reload_ext autoreload
Autosaving every 60 seconds
```

## 1. Implement the two classes and one function (10 points)

In this step, you should implement the two classes and one function mentioned above. The autograder can check the correcness of your two classes, `DenseLayer` and `Feedforward`. Correct implementation of each of the two classes worths 5 points, so you will 10 points if you make both correct.

The autograder cannot check the training function because this function takes too much time to run.

## 2. A toy regression problem

By this step, you should already have implemented all necessary classes and functions in `implementation.py`. In this task, we have a toy regression problem. Please the data below and think about this question: is overfitting a problem for this problem? **Please write your answer below** (This particular question has no points, but you may want to show your thought).

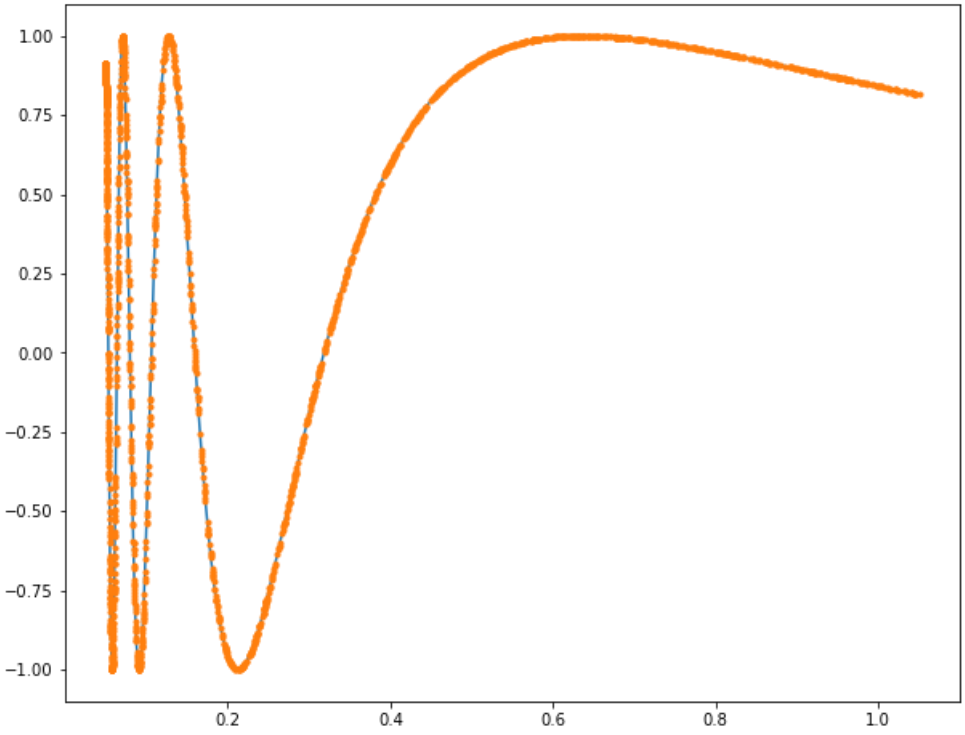
Overfitting is most likely not an issue for this problem as all points are directly sampled from the underlying function. Because there is no random variation introduced, a network acting as a universal function approximator will not attempt to account for such random variations. Therefore, a function will be able to be identified that is able to match the observed data with 100% accuracy.

In [79]:

```
def target_func(x):
    y = np.sin(1 / x)
    return y

# initialize training and validation sets.
x_train = np.power(np.random.random_sample([2000, 1]), 4) + 0.05
y_train = target_func(x_train)

x_val = np.power(np.random.random_sample([2000, 1]), 4) + 0.05
y_val = target_func(x_val)


# plot the function and data points
# Do you worry about overfitting problem?
sort_ind = np.argsort(x_train[:, 0])
plt.plot(x_train[sort_ind, 0], y_train[sort_ind, 0])
plt.plot(x_train[sort_ind, 0], y_train[sort_ind, 0], '.')
```

Out[79]:

```
[<matplotlib.lines.Line2D at 0x21900178888>]
```




### Train the model (5 points)

Now lets run your `train` function on this data. You will need to save your model to a file and submit it. We will test your saved model. You will earn

- 2 points if your validation MSE is smaller than 0.1
- 4 points if your validation MSE is smaller than 0.05
- 5 points if your validation MSE is smaller than 0.01

In [80]:

```
from implementation import train

#can change arguments as needed

#default
# model, history = train(x_train, y_train, x_val, y_val, depth=4, hidden_sizes=[8, 8, 8],
#                        reg_weight=0.000001, num_train_epochs=150, task_type='regression')

#custom
model, history = train(x_train, y_train, x_val, y_val, depth=4, hidden_sizes=[8,8,8],
                       reg_weight=0.001, num_train_epochs=1500, task_type='regression')
```

```
Epoch 1/1500
WARNING:tensorflow:Layer dense_layer_103 is casting an input tensor from dtype float64 to the layer's dty
pe of float32, which is new behavior in TensorFlow 2.  The layer has dtype float32 because its dtype
defaults to floatx.

If you intended to run this layer in float32, you can safely ignore this warning. If in doubt, this warn
ing is likely only an issue if you are porting a TensorFlow 1.X model to TensorFlow 2.

To change all layers to have dtype float64 by default, call `tf.keras.backend.set_floatx('float64')`. To
change just this layer, pass dtype='float64' to the layer constructor. If you are the author of this
layer, you can disable autocasting by passing autocast=False to the base Layer constructor.

32/32 [==============================] - 0s 4ms/step - loss: 0.8463 - accuracy: 0.0000e+00 - val_loss: 0
.5678 - val_accuracy: 0.0000e+00
Epoch 2/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.5010 - accuracy: 0.0000e+00 - val_loss: 0
.4875 - val_accuracy: 0.0000e+00
Epoch 3/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.4533 - accuracy: 0.0000e+00 - val_loss: 0
.4408 - val_accuracy: 0.0000e+00
Epoch 4/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.3694 - accuracy: 0.0000e+00 - val_loss: 0
.3392 - val_accuracy: 0.0000e+00
Epoch 5/1500
```

```
Epoch 5/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.3021 - accuracy: 0.0000e+00 - val_loss: 0
.3043 - val_accuracy: 0.0000e+00
Epoch 6/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2886 - accuracy: 0.0000e+00 - val_loss: 0
.2944 - val_accuracy: 0.0000e+00
Epoch 7/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2833 - accuracy: 0.0000e+00 - val_loss: 0
.2845 - val_accuracy: 0.0000e+00
Epoch 8/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2760 - accuracy: 0.0000e+00 - val_loss: 0
.2814 - val_accuracy: 0.0000e+00
Epoch 9/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2733 - accuracy: 0.0000e+00 - val_loss: 0
.2805 - val_accuracy: 0.0000e+00
Epoch 10/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2735 - accuracy: 0.0000e+00 - val_loss: 0
.2800 - val_accuracy: 0.0000e+00
Epoch 11/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2701 - accuracy: 0.0000e+00 - val_loss: 0
.2806 - val_accuracy: 0.0000e+00
Epoch 12/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2712 - accuracy: 0.0000e+00 - val_loss: 0
.2774 - val_accuracy: 0.0000e+00
Epoch 13/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2669 - accuracy: 0.0000e+00 - val_loss: 0
.2753 - val_accuracy: 0.0000e+00
Epoch 14/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2650 - accuracy: 0.0000e+00 - val_loss: 0
.2753 - val_accuracy: 0.0000e+00
Epoch 15/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2652 - accuracy: 0.0000e+00 - val_loss: 0
.2743 - val_accuracy: 0.0000e+00
Epoch 16/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2648 - accuracy: 0.0000e+00 - val_loss: 0
.2727 - val_accuracy: 0.0000e+00
Epoch 17/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2639 - accuracy: 0.0000e+00 - val_loss: 0
.2744 - val_accuracy: 0.0000e+00
Epoch 18/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2628 - accuracy: 0.0000e+00 - val_loss: 0
.2748 - val_accuracy: 0.0000e+00
Epoch 19/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2659 - accuracy: 0.0000e+00 - val_loss: 0
.2751 - val_accuracy: 0.0000e+00
Epoch 20/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2658 - accuracy: 0.0000e+00 - val_loss: 0
.2733 - val_accuracy: 0.0000e+00
Epoch 21/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2664 - accuracy: 0.0000e+00 - val_loss: 0
.2733 - val_accuracy: 0.0000e+00
Epoch 22/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2668 - accuracy: 0.0000e+00 - val_loss: 0
.2765 - val_accuracy: 0.0000e+00
Epoch 23/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2653 - accuracy: 0.0000e+00 - val_loss: 0
.2821 - val_accuracy: 0.0000e+00
Epoch 24/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2665 - accuracy: 0.0000e+00 - val_loss: 0
.2747 - val_accuracy: 0.0000e+00
Epoch 25/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2633 - accuracy: 0.0000e+00 - val_loss: 0
.2709 - val_accuracy: 0.0000e+00
Epoch 26/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2645 - accuracy: 0.0000e+00 - val_loss: 0
.2705 - val_accuracy: 0.0000e+00
Epoch 27/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2616 - accuracy: 0.0000e+00 - val_loss: 0
.2698 - val_accuracy: 0.0000e+00
Epoch 28/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2620 - accuracy: 0.0000e+00 - val_loss: 0
.2677 - val_accuracy: 0.0000e+00
Epoch 29/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2591 - accuracy: 0.0000e+00 - val_loss: 0
.2753 - val_accuracy: 0.0000e+00
Epoch 30/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2549 - accuracy: 0.0000e+00 - val_loss: 0
.2575 - val_accuracy: 0.0000e+00
```

.2575 - val_accuracy: 0.0000e+00
Epoch 31/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2416 - accuracy: 0.0000e+00 - val_loss: 0
.3304 - val_accuracy: 0.0000e+00
Epoch 32/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2892 - accuracy: 0.0000e+00 - val_loss: 0
.2683 - val_accuracy: 0.0000e+00
Epoch 33/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2458 - accuracy: 0.0000e+00 - val_loss: 0
.2414 - val_accuracy: 0.0000e+00
Epoch 34/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2227 - accuracy: 0.0000e+00 - val_loss: 0
.2256 - val_accuracy: 0.0000e+00
Epoch 35/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2249 - accuracy: 0.0000e+00 - val_loss: 0
.2204 - val_accuracy: 0.0000e+00
Epoch 36/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2204 - accuracy: 0.0000e+00 - val_loss: 0
.2173 - val_accuracy: 0.0000e+00
Epoch 37/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2174 - accuracy: 0.0000e+00 - val_loss: 0
.2335 - val_accuracy: 0.0000e+00
Epoch 38/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2088 - accuracy: 0.0000e+00 - val_loss: 0
.2163 - val_accuracy: 0.0000e+00
Epoch 39/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.2024 - accuracy: 0.0000e+00 - val_loss: 0
.2047 - val_accuracy: 0.0000e+00
Epoch 40/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1962 - accuracy: 0.0000e+00 - val_loss: 0
.2031 - val_accuracy: 0.0000e+00
Epoch 41/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1946 - accuracy: 0.0000e+00 - val_loss: 0
.2045 - val_accuracy: 0.0000e+00
Epoch 42/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1934 - accuracy: 0.0000e+00 - val_loss: 0
.2001 - val_accuracy: 0.0000e+00
Epoch 43/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1970 - accuracy: 0.0000e+00 - val_loss: 0
.2003 - val_accuracy: 0.0000e+00
Epoch 44/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1954 - accuracy: 0.0000e+00 - val_loss: 0
.1987 - val_accuracy: 0.0000e+00
Epoch 45/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1869 - accuracy: 0.0000e+00 - val_loss: 0
.1953 - val_accuracy: 0.0000e+00
Epoch 46/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1860 - accuracy: 0.0000e+00 - val_loss: 0
.1930 - val_accuracy: 0.0000e+00
Epoch 47/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1853 - accuracy: 0.0000e+00 - val_loss: 0
.1972 - val_accuracy: 0.0000e+00
Epoch 48/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1861 - accuracy: 0.0000e+00 - val_loss: 0
.1885 - val_accuracy: 0.0000e+00
Epoch 49/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1811 - accuracy: 0.0000e+00 - val_loss: 0
.1869 - val_accuracy: 0.0000e+00
Epoch 50/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1804 - accuracy: 0.0000e+00 - val_loss: 0
.1871 - val_accuracy: 0.0000e+00
Epoch 51/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1817 - accuracy: 0.0000e+00 - val_loss: 0
.1872 - val_accuracy: 0.0000e+00
Epoch 52/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1811 - accuracy: 0.0000e+00 - val_loss: 0
.1859 - val_accuracy: 0.0000e+00
Epoch 53/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1787 - accuracy: 0.0000e+00 - val_loss: 0
.1845 - val_accuracy: 0.0000e+00
Epoch 54/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1790 - accuracy: 0.0000e+00 - val_loss: 0
.1856 - val_accuracy: 0.0000e+00
Epoch 55/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1795 - accuracy: 0.0000e+00 - val_loss: 0
.1903 - val_accuracy: 0.0000e+00
Epoch 56/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1820 - accuracy: 0.0000e+00 - val_loss: 0

```
32/32 [==============================] - 0s 2ms/step - loss: 0.1820 - accuracy: 0.0000e+00 - val_loss: 0
.1885 - val_accuracy: 0.0000e+00
Epoch 57/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1799 - accuracy: 0.0000e+00 - val_loss: 0
.1832 - val_accuracy: 0.0000e+00
Epoch 58/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1786 - accuracy: 0.0000e+00 - val_loss: 0
.1825 - val_accuracy: 0.0000e+00
Epoch 59/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1788 - accuracy: 0.0000e+00 - val_loss: 0
.1871 - val_accuracy: 0.0000e+00
Epoch 60/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1773 - accuracy: 0.0000e+00 - val_loss: 0
.1829 - val_accuracy: 0.0000e+00
Epoch 61/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1766 - accuracy: 0.0000e+00 - val_loss: 0
.1821 - val_accuracy: 0.0000e+00
Epoch 62/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1778 - accuracy: 0.0000e+00 - val_loss: 0
.1845 - val_accuracy: 0.0000e+00
Epoch 63/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1759 - accuracy: 0.0000e+00 - val_loss: 0
.1828 - val_accuracy: 0.0000e+00
Epoch 64/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1777 - accuracy: 0.0000e+00 - val_loss: 0
.1846 - val_accuracy: 0.0000e+00
Epoch 65/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1764 - accuracy: 0.0000e+00 - val_loss: 0
.1819 - val_accuracy: 0.0000e+00
Epoch 66/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1772 - accuracy: 0.0000e+00 - val_loss: 0
.1832 - val_accuracy: 0.0000e+00
Epoch 67/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1818 - accuracy: 0.0000e+00 - val_loss: 0
.1814 - val_accuracy: 0.0000e+00
Epoch 68/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1764 - accuracy: 0.0000e+00 - val_loss: 0
.1852 - val_accuracy: 0.0000e+00
Epoch 69/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1773 - accuracy: 0.0000e+00 - val_loss: 0
.1845 - val_accuracy: 0.0000e+00
Epoch 70/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1791 - accuracy: 0.0000e+00 - val_loss: 0
.1833 - val_accuracy: 0.0000e+00
Epoch 71/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1757 - accuracy: 0.0000e+00 - val_loss: 0
.1809 - val_accuracy: 0.0000e+00
Epoch 72/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1754 - accuracy: 0.0000e+00 - val_loss: 0
.1824 - val_accuracy: 0.0000e+00
Epoch 73/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1795 - accuracy: 0.0000e+00 - val_loss: 0
.1833 - val_accuracy: 0.0000e+00
Epoch 74/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1808 - accuracy: 0.0000e+00 - val_loss: 0
.1835 - val_accuracy: 0.0000e+00
Epoch 75/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1766 - accuracy: 0.0000e+00 - val_loss: 0
.1811 - val_accuracy: 0.0000e+00
Epoch 76/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1753 - accuracy: 0.0000e+00 - val_loss: 0
.1812 - val_accuracy: 0.0000e+00
Epoch 77/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1747 - accuracy: 0.0000e+00 - val_loss: 0
.1804 - val_accuracy: 0.0000e+00
Epoch 78/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1747 - accuracy: 0.0000e+00 - val_loss: 0
.1818 - val_accuracy: 0.0000e+00
Epoch 79/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1769 - accuracy: 0.0000e+00 - val_loss: 0
.1814 - val_accuracy: 0.0000e+00
Epoch 80/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1738 - accuracy: 0.0000e+00 - val_loss: 0
.1814 - val_accuracy: 0.0000e+00
Epoch 81/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1745 - accuracy: 0.0000e+00 - val_loss: 0
.1808 - val_accuracy: 0.0000e+00
Epoch 82/1500
```

```
Epoch 82/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1742 - accuracy: 0.0000e+00 - val_loss: 0
.1810 - val_accuracy: 0.0000e+00
Epoch 83/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1759 - accuracy: 0.0000e+00 - val_loss: 0
.1832 - val_accuracy: 0.0000e+00
Epoch 84/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1757 - accuracy: 0.0000e+00 - val_loss: 0
.1805 - val_accuracy: 0.0000e+00
Epoch 85/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1784 - accuracy: 0.0000e+00 - val_loss: 0
.1831 - val_accuracy: 0.0000e+00
Epoch 86/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1770 - accuracy: 0.0000e+00 - val_loss: 0
.1830 - val_accuracy: 0.0000e+00
Epoch 87/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1767 - accuracy: 0.0000e+00 - val_loss: 0
.1819 - val_accuracy: 0.0000e+00
Epoch 88/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1769 - accuracy: 0.0000e+00 - val_loss: 0
.1824 - val_accuracy: 0.0000e+00
Epoch 89/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1757 - accuracy: 0.0000e+00 - val_loss: 0
.1850 - val_accuracy: 0.0000e+00
Epoch 90/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1759 - accuracy: 0.0000e+00 - val_loss: 0
.1841 - val_accuracy: 0.0000e+00
Epoch 91/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1802 - accuracy: 0.0000e+00 - val_loss: 0
.1822 - val_accuracy: 0.0000e+00
Epoch 92/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1767 - accuracy: 0.0000e+00 - val_loss: 0
.1837 - val_accuracy: 0.0000e+00
Epoch 93/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1781 - accuracy: 0.0000e+00 - val_loss: 0
.1805 - val_accuracy: 0.0000e+00
Epoch 94/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1746 - accuracy: 0.0000e+00 - val_loss: 0
.1819 - val_accuracy: 0.0000e+00
Epoch 95/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1779 - accuracy: 0.0000e+00 - val_loss: 0
.1832 - val_accuracy: 0.0000e+00
Epoch 96/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1773 - accuracy: 0.0000e+00 - val_loss: 0
.1806 - val_accuracy: 0.0000e+00
Epoch 97/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1770 - accuracy: 0.0000e+00 - val_loss: 0
.1815 - val_accuracy: 0.0000e+00
Epoch 98/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1747 - accuracy: 0.0000e+00 - val_loss: 0
.1820 - val_accuracy: 0.0000e+00
Epoch 99/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1740 - accuracy: 0.0000e+00 - val_loss: 0
.1889 - val_accuracy: 0.0000e+00
Epoch 100/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1804 - accuracy: 0.0000e+00 - val_loss: 0
.1873 - val_accuracy: 0.0000e+00
Epoch 101/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1772 - accuracy: 0.0000e+00 - val_loss: 0
.1863 - val_accuracy: 0.0000e+00
Epoch 102/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1755 - accuracy: 0.0000e+00 - val_loss: 0
.1809 - val_accuracy: 0.0000e+00
Epoch 103/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1749 - accuracy: 0.0000e+00 - val_loss: 0
.1853 - val_accuracy: 0.0000e+00
Epoch 104/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1744 - accuracy: 0.0000e+00 - val_loss: 0
.1798 - val_accuracy: 0.0000e+00
Epoch 105/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1738 - accuracy: 0.0000e+00 - val_loss: 0
.1806 - val_accuracy: 0.0000e+00
Epoch 106/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1735 - accuracy: 0.0000e+00 - val_loss: 0
.1804 - val_accuracy: 0.0000e+00
Epoch 107/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1747 - accuracy: 0.0000e+00 - val_loss: 0
```

```
.1803 - val_accuracy: 0.0000e+00
Epoch 108/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1739 - accuracy: 0.0000e+00 - val_loss: 0
.1817 - val_accuracy: 0.0000e+00
Epoch 109/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1747 - accuracy: 0.0000e+00 - val_loss: 0
.1818 - val_accuracy: 0.0000e+00
Epoch 110/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1786 - accuracy: 0.0000e+00 - val_loss: 0
.1835 - val_accuracy: 0.0000e+00
Epoch 111/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1778 - accuracy: 0.0000e+00 - val_loss: 0
.1820 - val_accuracy: 0.0000e+00
Epoch 112/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1744 - accuracy: 0.0000e+00 - val_loss: 0
.1794 - val_accuracy: 0.0000e+00
Epoch 113/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1747 - accuracy: 0.0000e+00 - val_loss: 0
.1801 - val_accuracy: 0.0000e+00
Epoch 114/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1755 - accuracy: 0.0000e+00 - val_loss: 0
.1798 - val_accuracy: 0.0000e+00
Epoch 115/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1739 - accuracy: 0.0000e+00 - val_loss: 0
.1797 - val_accuracy: 0.0000e+00
Epoch 116/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1742 - accuracy: 0.0000e+00 - val_loss: 0
.1802 - val_accuracy: 0.0000e+00
Epoch 117/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1763 - accuracy: 0.0000e+00 - val_loss: 0
.1824 - val_accuracy: 0.0000e+00
Epoch 118/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1801 - accuracy: 0.0000e+00 - val_loss: 0
.1817 - val_accuracy: 0.0000e+00
Epoch 119/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1769 - accuracy: 0.0000e+00 - val_loss: 0
.1800 - val_accuracy: 0.0000e+00
Epoch 120/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1761 - accuracy: 0.0000e+00 - val_loss: 0
.1810 - val_accuracy: 0.0000e+00
Epoch 121/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1757 - accuracy: 0.0000e+00 - val_loss: 0
.1830 - val_accuracy: 0.0000e+00
Epoch 122/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1751 - accuracy: 0.0000e+00 - val_loss: 0
.1823 - val_accuracy: 0.0000e+00
Epoch 123/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1771 - accuracy: 0.0000e+00 - val_loss: 0
.1836 - val_accuracy: 0.0000e+00
Epoch 124/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1740 - accuracy: 0.0000e+00 - val_loss: 0
.1799 - val_accuracy: 0.0000e+00
Epoch 125/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1777 - accuracy: 0.0000e+00 - val_loss: 0
.1794 - val_accuracy: 0.0000e+00
Epoch 126/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1744 - accuracy: 0.0000e+00 - val_loss: 0
.1800 - val_accuracy: 0.0000e+00
Epoch 127/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1744 - accuracy: 0.0000e+00 - val_loss: 0
.1806 - val_accuracy: 0.0000e+00
Epoch 128/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1769 - accuracy: 0.0000e+00 - val_loss: 0
.1797 - val_accuracy: 0.0000e+00
Epoch 129/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1742 - accuracy: 0.0000e+00 - val_loss: 0
.1792 - val_accuracy: 0.0000e+00
Epoch 130/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1738 - accuracy: 0.0000e+00 - val_loss: 0
.1800 - val_accuracy: 0.0000e+00
Epoch 131/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1744 - accuracy: 0.0000e+00 - val_loss: 0
.1798 - val_accuracy: 0.0000e+00
Epoch 132/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1737 - accuracy: 0.0000e+00 - val_loss: 0
.1818 - val_accuracy: 0.0000e+00
Epoch 133/1500
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32/32 [==============================] - 0s 2ms/step - loss: 0.1749 - accuracy: 0.0000e+00 - val_loss: 0
.1813 - val_accuracy: 0.0000e+00
Epoch 134/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1757 - accuracy: 0.0000e+00 - val_loss: 0
.1799 - val_accuracy: 0.0000e+00
Epoch 135/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1748 - accuracy: 0.0000e+00 - val_loss: 0
.1797 - val_accuracy: 0.0000e+00
Epoch 136/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1744 - accuracy: 0.0000e+00 - val_loss: 0
.1796 - val_accuracy: 0.0000e+00
Epoch 137/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1741 - accuracy: 0.0000e+00 - val_loss: 0
.1848 - val_accuracy: 0.0000e+00
Epoch 138/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1781 - accuracy: 0.0000e+00 - val_loss: 0
.1800 - val_accuracy: 0.0000e+00
Epoch 139/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1772 - accuracy: 0.0000e+00 - val_loss: 0
.1879 - val_accuracy: 0.0000e+00
Epoch 140/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1738 - accuracy: 0.0000e+00 - val_loss: 0
.1809 - val_accuracy: 0.0000e+00
Epoch 141/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1796 - accuracy: 0.0000e+00 - val_loss: 0
.1801 - val_accuracy: 0.0000e+00
Epoch 142/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1750 - accuracy: 0.0000e+00 - val_loss: 0
.1798 - val_accuracy: 0.0000e+00
Epoch 143/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1734 - accuracy: 0.0000e+00 - val_loss: 0
.1797 - val_accuracy: 0.0000e+00
Epoch 144/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1747 - accuracy: 0.0000e+00 - val_loss: 0
.1800 - val_accuracy: 0.0000e+00
Epoch 145/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1765 - accuracy: 0.0000e+00 - val_loss: 0
.1802 - val_accuracy: 0.0000e+00
Epoch 146/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1736 - accuracy: 0.0000e+00 - val_loss: 0
.1796 - val_accuracy: 0.0000e+00
Epoch 147/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1796 - accuracy: 0.0000e+00 - val_loss: 0
.1853 - val_accuracy: 0.0000e+00
Epoch 148/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1772 - accuracy: 0.0000e+00 - val_loss: 0
.1796 - val_accuracy: 0.0000e+00
Epoch 149/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1753 - accuracy: 0.0000e+00 - val_loss: 0
.1937 - val_accuracy: 0.0000e+00
Epoch 150/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1818 - accuracy: 0.0000e+00 - val_loss: 0
.1821 - val_accuracy: 0.0000e+00
Epoch 151/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1741 - accuracy: 0.0000e+00 - val_loss: 0
.1799 - val_accuracy: 0.0000e+00
Epoch 152/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1761 - accuracy: 0.0000e+00 - val_loss: 0
.1866 - val_accuracy: 0.0000e+00
Epoch 153/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1760 - accuracy: 0.0000e+00 - val_loss: 0
.1780 - val_accuracy: 0.0000e+00
Epoch 154/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1732 - accuracy: 0.0000e+00 - val_loss: 0
.1778 - val_accuracy: 0.0000e+00
Epoch 155/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1700 - accuracy: 0.0000e+00 - val_loss: 0
.1720 - val_accuracy: 0.0000e+00
Epoch 156/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1808 - accuracy: 0.0000e+00 - val_loss: 0
.1769 - val_accuracy: 0.0000e+00
Epoch 157/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1783 - accuracy: 0.0000e+00 - val_loss: 0
.2013 - val_accuracy: 0.0000e+00
Epoch 158/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1746 - accuracy: 0.0000e+00 - val_loss: 0
.1649 - val_accuracy: 0.0000e+00
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Epoch 159/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1608 - accuracy: 0.0000e+00 - val_loss: 0
.1634 - val_accuracy: 0.0000e+00
Epoch 160/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1611 - accuracy: 0.0000e+00 - val_loss: 0
.1454 - val_accuracy: 0.0000e+00
Epoch 161/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1505 - accuracy: 0.0000e+00 - val_loss: 0
.1793 - val_accuracy: 0.0000e+00
Epoch 162/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1467 - accuracy: 0.0000e+00 - val_loss: 0
.1522 - val_accuracy: 0.0000e+00
Epoch 163/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1124 - accuracy: 0.0000e+00 - val_loss: 0
.0958 - val_accuracy: 0.0000e+00
Epoch 164/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0905 - accuracy: 0.0000e+00 - val_loss: 0
.0703 - val_accuracy: 0.0000e+00
Epoch 165/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0613 - accuracy: 0.0000e+00 - val_loss: 0
.0477 - val_accuracy: 0.0000e+00
Epoch 166/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0447 - accuracy: 0.0000e+00 - val_loss: 0
.0478 - val_accuracy: 0.0000e+00
Epoch 167/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0329 - accuracy: 0.0000e+00 - val_loss: 0
.0223 - val_accuracy: 0.0000e+00
Epoch 168/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0390 - accuracy: 0.0000e+00 - val_loss: 0
.0215 - val_accuracy: 0.0000e+00
Epoch 169/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0164 - accuracy: 0.0000e+00 - val_loss: 0
.0147 - val_accuracy: 0.0000e+00
Epoch 170/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0132 - accuracy: 0.0000e+00 - val_loss: 0
.0099 - val_accuracy: 0.0000e+00
Epoch 171/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0099 - accuracy: 0.0000e+00 - val_loss: 0
.0109 - val_accuracy: 0.0000e+00
Epoch 172/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0119 - accuracy: 0.0000e+00 - val_loss: 0
.0119 - val_accuracy: 0.0000e+00
Epoch 173/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0084 - accuracy: 0.0000e+00 - val_loss: 0
.0076 - val_accuracy: 0.0000e+00
Epoch 174/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0073 - accuracy: 0.0000e+00 - val_loss: 0
.0099 - val_accuracy: 0.0000e+00
Epoch 175/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0078 - accuracy: 0.0000e+00 - val_loss: 0
.0058 - val_accuracy: 0.0000e+00
Epoch 176/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0065 - accuracy: 0.0000e+00 - val_loss: 0
.0066 - val_accuracy: 0.0000e+00
Epoch 177/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0057 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 178/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0067 - val_accuracy: 0.0000e+00
Epoch 179/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0067 - accuracy: 0.0000e+00 - val_loss: 0
.0066 - val_accuracy: 0.0000e+00
Epoch 180/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
Epoch 181/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0070 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 182/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0105 - val_accuracy: 0.0000e+00
Epoch 183/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0134 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 184/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0215 - accuracy: 0.0000e+00 - val_loss: 0
```

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.0133 - val_accuracy: 0.0000e+00
Epoch 185/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0078 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 186/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 187/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 188/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0075 - val_accuracy: 0.0000e+00
Epoch 189/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0062 - accuracy: 0.0000e+00 - val_loss: 0
.0054 - val_accuracy: 0.0000e+00
Epoch 190/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0072 - val_accuracy: 0.0000e+00
Epoch 191/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0092 - accuracy: 0.0000e+00 - val_loss: 0
.0225 - val_accuracy: 0.0000e+00
Epoch 192/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0119 - accuracy: 0.0000e+00 - val_loss: 0
.0127 - val_accuracy: 0.0000e+00
Epoch 193/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 194/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 195/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 196/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0092 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 197/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0070 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 198/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 199/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 200/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0061 - accuracy: 0.0000e+00 - val_loss: 0
.0160 - val_accuracy: 0.0000e+00
Epoch 201/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0075 - accuracy: 0.0000e+00 - val_loss: 0
.0068 - val_accuracy: 0.0000e+00
Epoch 202/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
Epoch 203/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0084 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 204/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0140 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 205/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0068 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 206/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 207/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 208/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 209/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 210/1500
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32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 211/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0182 - val_accuracy: 0.0000e+00
Epoch 212/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0065 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 213/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 214/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 215/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 216/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 217/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0058 - val_accuracy: 0.0000e+00
Epoch 218/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0107 - accuracy: 0.0000e+00 - val_loss: 0
.0059 - val_accuracy: 0.0000e+00
Epoch 219/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0075 - accuracy: 0.0000e+00 - val_loss: 0
.0109 - val_accuracy: 0.0000e+00
Epoch 220/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0096 - accuracy: 0.0000e+00 - val_loss: 0
.0168 - val_accuracy: 0.0000e+00
Epoch 221/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0089 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 222/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 223/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 224/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 225/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 226/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 227/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 228/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0061 - accuracy: 0.0000e+00 - val_loss: 0
.0076 - val_accuracy: 0.0000e+00
Epoch 229/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 230/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 231/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 232/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0064 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 233/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 234/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0063 - val_accuracy: 0.0000e+00
Epoch 235/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
```

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Epoch 236/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 237/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 238/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0061 - accuracy: 0.0000e+00 - val_loss: 0
.0059 - val_accuracy: 0.0000e+00
Epoch 239/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0065 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 240/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 241/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 242/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0141 - val_accuracy: 0.0000e+00
Epoch 243/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0104 - accuracy: 0.0000e+00 - val_loss: 0
.0071 - val_accuracy: 0.0000e+00
Epoch 244/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 245/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0073 - accuracy: 0.0000e+00 - val_loss: 0
.0117 - val_accuracy: 0.0000e+00
Epoch 246/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 247/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 248/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 249/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 250/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val_accuracy: 0.0000e+00
Epoch 251/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 252/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0044 - val_accuracy: 0.0000e+00
Epoch 253/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 254/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 255/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 256/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 257/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0065 - val_accuracy: 0.0000e+00
Epoch 258/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 259/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 260/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 261/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0054 - accuracy: 0.0000e+00 - val_loss: 0
```

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.0038 - val_accuracy: 0.0000e+00
Epoch 262/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 263/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 264/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0192 - accuracy: 0.0000e+00 - val_loss: 0
.1822 - val_accuracy: 0.0000e+00
Epoch 265/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.1442 - accuracy: 0.0000e+00 - val_loss: 0
.0904 - val_accuracy: 0.0000e+00
Epoch 266/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0375 - accuracy: 0.0000e+00 - val_loss: 0
.0075 - val_accuracy: 0.0000e+00
Epoch 267/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0080 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 268/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 269/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 270/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 271/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 272/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 273/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 274/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0044 - val_accuracy: 0.0000e+00
Epoch 275/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 276/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 277/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 278/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 279/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0067 - val_accuracy: 0.0000e+00
Epoch 280/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 281/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 282/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0060 - val_accuracy: 0.0000e+00
Epoch 283/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 284/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 285/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0073 - val_accuracy: 0.0000e+00
Epoch 286/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0064 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 287/1500
```

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32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0074 - val_accuracy: 0.0000e+00
Epoch 288/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0051 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 289/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 290/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 291/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 292/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 293/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 294/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 295/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 296/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 297/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0084 - val_accuracy: 0.0000e+00
Epoch 298/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 299/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 300/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 301/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0631 - val_accuracy: 0.0000e+00
Epoch 302/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0192 - accuracy: 0.0000e+00 - val_loss: 0
.0092 - val_accuracy: 0.0000e+00
Epoch 303/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 304/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 305/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 306/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0052 - val_accuracy: 0.0000e+00
Epoch 307/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 308/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 309/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 310/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 311/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 312/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val accuracy: 0.0000e+00
```

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Epoch 313/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0071 - accuracy: 0.0000e+00 - val_loss: 0
.0130 - val_accuracy: 0.0000e+00
Epoch 314/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0233 - accuracy: 0.0000e+00 - val_loss: 0
.0140 - val_accuracy: 0.0000e+00
Epoch 315/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0209 - accuracy: 0.0000e+00 - val_loss: 0
.0088 - val_accuracy: 0.0000e+00
Epoch 316/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0062 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 317/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 318/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 319/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0052 - val_accuracy: 0.0000e+00
Epoch 320/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 321/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 322/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 323/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 324/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 325/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 326/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 327/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 328/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 329/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 330/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 331/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 332/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 333/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0156 - val_accuracy: 0.0000e+00
Epoch 334/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0069 - val_accuracy: 0.0000e+00
Epoch 335/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0060 - val_accuracy: 0.0000e+00
Epoch 336/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 337/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 338/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
```

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.0040 - val_accuracy: 0.0000e+00
Epoch 339/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0091 - val_accuracy: 0.0000e+00
Epoch 340/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 341/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 342/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0100 - val_accuracy: 0.0000e+00
Epoch 343/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0076 - accuracy: 0.0000e+00 - val_loss: 0
.0076 - val_accuracy: 0.0000e+00
Epoch 344/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0060 - val_accuracy: 0.0000e+00
Epoch 345/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 346/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 347/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 348/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0071 - val_accuracy: 0.0000e+00
Epoch 349/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0052 - val_accuracy: 0.0000e+00
Epoch 350/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 351/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0058 - val_accuracy: 0.0000e+00
Epoch 352/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 353/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 354/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 355/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 356/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 357/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0085 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 358/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 359/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 360/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val_accuracy: 0.0000e+00
Epoch 361/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 362/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 363/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 364/1500
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32/32 [==============================] - 0s 2ms/step - loss: 0.0057 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 365/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0154 - val_accuracy: 0.0000e+00
Epoch 366/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0074 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 367/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 368/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 369/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0051 - accuracy: 0.0000e+00 - val_loss: 0
.0130 - val_accuracy: 0.0000e+00
Epoch 370/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 371/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0060 - val_accuracy: 0.0000e+00
Epoch 372/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0098 - accuracy: 0.0000e+00 - val_loss: 0
.0075 - val_accuracy: 0.0000e+00
Epoch 373/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 374/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 375/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0060 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 376/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 377/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 378/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 379/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0071 - val_accuracy: 0.0000e+00
Epoch 380/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0149 - val_accuracy: 0.0000e+00
Epoch 381/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0078 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 382/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 383/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 384/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0058 - val_accuracy: 0.0000e+00
Epoch 385/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 386/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 387/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0078 - val_accuracy: 0.0000e+00
Epoch 388/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 389/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
```

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Epoch 390/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0063 - val_accuracy: 0.0000e+00
Epoch 391/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0062 - val_accuracy: 0.0000e+00
Epoch 392/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 393/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0065 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 394/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0065 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 395/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 396/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 397/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 398/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 399/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 400/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 401/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0066 - val_accuracy: 0.0000e+00
Epoch 402/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0044 - val_accuracy: 0.0000e+00
Epoch 403/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0067 - val_accuracy: 0.0000e+00
Epoch 404/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 405/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0087 - val_accuracy: 0.0000e+00
Epoch 406/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0068 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 407/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0074 - val_accuracy: 0.0000e+00
Epoch 408/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 409/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0066 - val_accuracy: 0.0000e+00
Epoch 410/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 411/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0099 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 412/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 413/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 414/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 415/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
```

.0107 - val_accuracy: 0.0000e+00
Epoch 416/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0064 - accuracy: 0.0000e+00 - val_loss: 0
.0074 - val_accuracy: 0.0000e+00
Epoch 417/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0054 - accuracy: 0.0000e+00 - val_loss: 0
.0076 - val_accuracy: 0.0000e+00
Epoch 418/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 419/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 420/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 421/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 422/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 423/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0064 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 424/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 425/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 426/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0072 - val_accuracy: 0.0000e+00
Epoch 427/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 428/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0122 - val_accuracy: 0.0000e+00
Epoch 429/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 430/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 431/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 432/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 433/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 434/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 435/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 436/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0064 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 437/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0122 - accuracy: 0.0000e+00 - val_loss: 0
.0069 - val_accuracy: 0.0000e+00
Epoch 438/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 439/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 440/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 441/1500

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Epoch 441/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val_accuracy: 0.0000e+00
Epoch 442/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0064 - accuracy: 0.0000e+00 - val_loss: 0
.0044 - val_accuracy: 0.0000e+00
Epoch 443/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 444/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 445/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 446/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 447/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0075 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 448/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0093 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 449/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val_accuracy: 0.0000e+00
Epoch 450/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 451/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 452/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 453/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0063 - accuracy: 0.0000e+00 - val_loss: 0
.0085 - val_accuracy: 0.0000e+00
Epoch 454/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0067 - val_accuracy: 0.0000e+00
Epoch 455/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0061 - val_accuracy: 0.0000e+00
Epoch 456/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0093 - accuracy: 0.0000e+00 - val_loss: 0
.0104 - val_accuracy: 0.0000e+00
Epoch 457/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0065 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 458/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 459/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 460/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 461/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 462/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 463/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 464/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 465/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 466/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
```

.0057 - val_accuracy: 0.0000e+00
Epoch 467/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0289 - val_accuracy: 0.0000e+00
Epoch 468/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0085 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 469/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0059 - val_accuracy: 0.0000e+00
Epoch 470/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0060 - val_accuracy: 0.0000e+00
Epoch 471/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0107 - val_accuracy: 0.0000e+00
Epoch 472/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 473/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0097 - accuracy: 0.0000e+00 - val_loss: 0
.0670 - val_accuracy: 0.0000e+00
Epoch 474/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0489 - accuracy: 0.0000e+00 - val_loss: 0
.0104 - val_accuracy: 0.0000e+00
Epoch 475/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0118 - accuracy: 0.0000e+00 - val_loss: 0
.0064 - val_accuracy: 0.0000e+00
Epoch 476/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 477/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 478/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0062 - accuracy: 0.0000e+00 - val_loss: 0
.0099 - val_accuracy: 0.0000e+00
Epoch 479/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 480/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 481/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 482/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 483/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 484/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 485/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 486/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 487/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 488/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 489/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 490/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 491/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 492/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0

32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 493/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 494/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 495/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 496/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 497/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 498/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 499/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 500/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 501/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val_accuracy: 0.0000e+00
Epoch 502/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 503/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 504/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0066 - val_accuracy: 0.0000e+00
Epoch 505/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 506/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 507/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 508/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 509/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0074 - val_accuracy: 0.0000e+00
Epoch 510/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 511/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 512/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 513/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0073 - accuracy: 0.0000e+00 - val_loss: 0
.0096 - val_accuracy: 0.0000e+00
Epoch 514/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0088 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 515/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0076 - accuracy: 0.0000e+00 - val_loss: 0
.0044 - val_accuracy: 0.0000e+00
Epoch 516/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 517/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 518/1500

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Epoch 518/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 519/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 520/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 521/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 522/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 523/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0108 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 524/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0081 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val_accuracy: 0.0000e+00
Epoch 525/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 526/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 527/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
Epoch 528/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 529/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 530/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 531/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 532/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 533/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 534/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 535/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 536/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 537/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 538/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 539/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 540/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 541/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0062 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 542/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 543/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
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.0035 - val_accuracy: 0.0000e+00
Epoch 544/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 545/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 546/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 547/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0111 - val_accuracy: 0.0000e+00
Epoch 548/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0065 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 549/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 550/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 551/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 552/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 553/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0066 - val_accuracy: 0.0000e+00
Epoch 554/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 555/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 556/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 557/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 558/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0083 - val_accuracy: 0.0000e+00
Epoch 559/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0122 - val_accuracy: 0.0000e+00
Epoch 560/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0108 - val_accuracy: 0.0000e+00
Epoch 561/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0057 - accuracy: 0.0000e+00 - val_loss: 0
.0073 - val_accuracy: 0.0000e+00
Epoch 562/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0077 - accuracy: 0.0000e+00 - val_loss: 0
.0054 - val_accuracy: 0.0000e+00
Epoch 563/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 564/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 565/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 566/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 567/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0147 - val_accuracy: 0.0000e+00
Epoch 568/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0067 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
Epoch 569/1500
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32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 570/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 571/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 572/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 573/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 574/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 575/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 576/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 577/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 578/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0086 - val_accuracy: 0.0000e+00
Epoch 579/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0087 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
Epoch 580/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0093 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 581/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 582/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 583/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 584/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 585/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 586/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 587/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0073 - val_accuracy: 0.0000e+00
Epoch 588/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 589/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 590/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 591/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0139 - val_accuracy: 0.0000e+00
Epoch 592/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0082 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 593/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 594/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
```

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Epoch 595/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 596/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 597/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 598/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 599/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 600/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0067 - accuracy: 0.0000e+00 - val_loss: 0
.0089 - val_accuracy: 0.0000e+00
Epoch 601/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 602/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 603/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 604/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0292 - val_accuracy: 0.0000e+00
Epoch 605/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0169 - accuracy: 0.0000e+00 - val_loss: 0
.0145 - val_accuracy: 0.0000e+00
Epoch 606/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0085 - accuracy: 0.0000e+00 - val_loss: 0
.0170 - val_accuracy: 0.0000e+00
Epoch 607/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 608/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 609/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 610/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 611/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 612/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0090 - val_accuracy: 0.0000e+00
Epoch 613/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 614/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 615/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 616/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 617/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 618/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0078 - val_accuracy: 0.0000e+00
Epoch 619/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0072 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 620/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0117 - accuracy: 0.0000e+00 - val_loss: 0
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.0167 - val_accuracy: 0.0000e+00
Epoch 621/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 622/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 623/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 624/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 625/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 626/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 627/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 628/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 629/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 630/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 631/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 632/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 633/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 634/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0063 - val_accuracy: 0.0000e+00
Epoch 635/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0075 - accuracy: 0.0000e+00 - val_loss: 0
.0126 - val_accuracy: 0.0000e+00
Epoch 636/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0235 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 637/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0098 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 638/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0071 - accuracy: 0.0000e+00 - val_loss: 0
.0085 - val_accuracy: 0.0000e+00
Epoch 639/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 640/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 641/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0076 - val_accuracy: 0.0000e+00
Epoch 642/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 643/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 644/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 645/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 646/1500
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32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 647/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 648/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0082 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 649/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 650/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 651/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 652/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 653/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 654/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 655/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 656/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 657/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 658/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 659/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 660/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 661/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 662/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0067 - val_accuracy: 0.0000e+00
Epoch 663/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 664/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 665/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 666/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 667/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 668/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 669/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 670/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 671/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
```

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Epoch 672/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 673/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 674/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 675/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 676/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0110 - val_accuracy: 0.0000e+00
Epoch 677/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0064 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 678/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 679/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0073 - val_accuracy: 0.0000e+00
Epoch 680/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0060 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 681/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0068 - val_accuracy: 0.0000e+00
Epoch 682/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 683/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 684/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 685/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 686/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 687/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 688/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 689/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0083 - val_accuracy: 0.0000e+00
Epoch 690/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0060 - accuracy: 0.0000e+00 - val_loss: 0
.0105 - val_accuracy: 0.0000e+00
Epoch 691/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0063 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 692/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 693/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 694/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 695/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 696/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 697/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
```

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.0035 - val_accuracy: 0.0000e+00
Epoch 698/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 699/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 700/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 701/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 702/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 703/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 704/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 705/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 706/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 707/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 708/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 709/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 710/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 711/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 712/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 713/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0076 - val_accuracy: 0.0000e+00
Epoch 714/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 715/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 716/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0077 - val_accuracy: 0.0000e+00
Epoch 717/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0057 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 718/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 719/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 720/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 721/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 722/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0052 - val_accuracy: 0.0000e+00
Epoch 723/1500
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32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0059 - val_accuracy: 0.0000e+00
Epoch 724/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 725/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 726/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 727/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 728/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0078 - val_accuracy: 0.0000e+00
Epoch 729/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0124 - accuracy: 0.0000e+00 - val_loss: 0
.0226 - val_accuracy: 0.0000e+00
Epoch 730/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0101 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 731/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0068 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 732/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0063 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 733/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 734/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0081 - val_accuracy: 0.0000e+00
Epoch 735/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 736/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 737/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 738/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 739/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 740/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 741/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 742/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 743/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0051 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 744/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 745/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 746/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 747/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 748/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val accuracy: 0.0000e+00
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Epoch 749/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 750/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 751/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 752/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 753/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0084 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 754/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 755/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0077 - val_accuracy: 0.0000e+00
Epoch 756/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0141 - accuracy: 0.0000e+00 - val_loss: 0
.0085 - val_accuracy: 0.0000e+00
Epoch 757/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0063 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 758/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 759/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 760/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 761/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 762/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 763/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 764/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 765/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0061 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
Epoch 766/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0081 - val_accuracy: 0.0000e+00
Epoch 767/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0070 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 768/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 769/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0069 - val_accuracy: 0.0000e+00
Epoch 770/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 771/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 772/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0068 - val_accuracy: 0.0000e+00
Epoch 773/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 774/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
```

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.0024 - val_accuracy: 0.0000e+00
Epoch 775/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 776/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 777/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 778/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 779/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0067 - val_accuracy: 0.0000e+00
Epoch 780/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 781/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 782/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0107 - val_accuracy: 0.0000e+00
Epoch 783/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0082 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 784/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 785/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 786/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 787/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 788/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 789/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 790/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 791/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 792/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0066 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 793/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 794/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 795/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0187 - val_accuracy: 0.0000e+00
Epoch 796/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0054 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 797/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 798/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0069 - val_accuracy: 0.0000e+00
Epoch 799/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 800/1500
```

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32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 801/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0089 - accuracy: 0.0000e+00 - val_loss: 0
.0220 - val_accuracy: 0.0000e+00
Epoch 802/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0198 - accuracy: 0.0000e+00 - val_loss: 0
.0287 - val_accuracy: 0.0000e+00
Epoch 803/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0108 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 804/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 805/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 806/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 807/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 808/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 809/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 810/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 811/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 812/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 813/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 814/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 815/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0153 - val_accuracy: 0.0000e+00
Epoch 816/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0063 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 817/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 818/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 819/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 820/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0054 - val_accuracy: 0.0000e+00
Epoch 821/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0057 - accuracy: 0.0000e+00 - val_loss: 0
.0054 - val_accuracy: 0.0000e+00
Epoch 822/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 823/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 824/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 825/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
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.0040 - val_accuracy: 0.0000e+00
Epoch 826/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 827/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 828/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 829/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 830/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 831/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 832/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 833/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 834/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 835/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 836/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0067 - val_accuracy: 0.0000e+00
Epoch 837/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 838/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 839/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 840/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 841/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 842/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 843/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 844/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 845/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 846/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 847/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0117 - val_accuracy: 0.0000e+00
Epoch 848/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0112 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 849/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 850/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 851/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0

.0026 - val_accuracy: 0.0000e+00
Epoch 852/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 853/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0066 - val_accuracy: 0.0000e+00
Epoch 854/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 855/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 856/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 857/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 858/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0091 - val_accuracy: 0.0000e+00
Epoch 859/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0069 - val_accuracy: 0.0000e+00
Epoch 860/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 861/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0074 - val_accuracy: 0.0000e+00
Epoch 862/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 863/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 864/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 865/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 866/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 867/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 868/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 869/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 870/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 871/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 872/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 873/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 874/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 875/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 876/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 877/1500

Epoch 877/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 878/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 879/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 880/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 881/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0088 - val_accuracy: 0.0000e+00
Epoch 882/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0062 - val_accuracy: 0.0000e+00
Epoch 883/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 884/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 885/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 886/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 887/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0112 - val_accuracy: 0.0000e+00
Epoch 888/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 889/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 890/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 891/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0087 - accuracy: 0.0000e+00 - val_loss: 0
.0099 - val_accuracy: 0.0000e+00
Epoch 892/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0185 - accuracy: 0.0000e+00 - val_loss: 0
.0117 - val_accuracy: 0.0000e+00
Epoch 893/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0066 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 894/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 895/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 896/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0095 - val_accuracy: 0.0000e+00
Epoch 897/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0068 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 898/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 899/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
Epoch 900/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 901/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 902/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00

.0041 - val_accuracy: 0.0000e+00
Epoch 903/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 904/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 905/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 906/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 907/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 908/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 909/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 910/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 911/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0080 - val_accuracy: 0.0000e+00
Epoch 912/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 913/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 914/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 915/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 916/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 917/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 918/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 919/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 920/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 921/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 922/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 923/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0078 - val_accuracy: 0.0000e+00
Epoch 924/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0143 - val_accuracy: 0.0000e+00
Epoch 925/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 926/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 927/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 928/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0

32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 929/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 930/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 931/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 932/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 933/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 934/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 935/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 936/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 937/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 938/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 939/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 940/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 941/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 942/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0075 - val_accuracy: 0.0000e+00
Epoch 943/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 944/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0073 - val_accuracy: 0.0000e+00
Epoch 945/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0085 - val_accuracy: 0.0000e+00
Epoch 946/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 947/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0068 - val_accuracy: 0.0000e+00
Epoch 948/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 949/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0059 - val_accuracy: 0.0000e+00
Epoch 950/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 951/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 952/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 953/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 954/1500

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Epoch 954/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 955/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 956/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 957/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 958/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0065 - val_accuracy: 0.0000e+00
Epoch 959/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 960/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 961/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 962/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 963/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 964/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0051 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 965/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 966/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 967/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 968/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 969/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 970/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0065 - accuracy: 0.0000e+00 - val_loss: 0
.0237 - val_accuracy: 0.0000e+00
Epoch 971/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 972/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 973/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 974/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 975/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 976/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 977/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 978/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 979/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
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.0028 - val_accuracy: 0.0000e+00
Epoch 980/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 981/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 982/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 983/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 984/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 985/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 986/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0054 - val_accuracy: 0.0000e+00
Epoch 987/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val_accuracy: 0.0000e+00
Epoch 988/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 989/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0060 - accuracy: 0.0000e+00 - val_loss: 0
.0109 - val_accuracy: 0.0000e+00
Epoch 990/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 991/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 992/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 993/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 994/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 995/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 996/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 997/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 998/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 999/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1000/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 1001/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1002/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1003/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1004/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1005/1500
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32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1006/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 1007/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1008/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0052 - val_accuracy: 0.0000e+00
Epoch 1009/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1010/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 1011/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1012/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 1013/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1014/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1015/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 1016/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1017/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1018/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0066 - val_accuracy: 0.0000e+00
Epoch 1019/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1020/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1021/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0154 - val_accuracy: 0.0000e+00
Epoch 1022/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 1023/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0098 - accuracy: 0.0000e+00 - val_loss: 0
.0086 - val_accuracy: 0.0000e+00
Epoch 1024/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0243 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 1025/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1026/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1027/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1028/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1029/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1030/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
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Epoch 1031/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1032/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1033/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1034/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1035/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1036/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1037/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1038/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1039/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1040/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1041/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 1042/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1043/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 1044/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1045/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0088 - val_accuracy: 0.0000e+00
Epoch 1046/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1047/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0102 - val_accuracy: 0.0000e+00
Epoch 1048/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0073 - accuracy: 0.0000e+00 - val_loss: 0
.0125 - val_accuracy: 0.0000e+00
Epoch 1049/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0106 - accuracy: 0.0000e+00 - val_loss: 0
.0077 - val_accuracy: 0.0000e+00
Epoch 1050/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0058 - val_accuracy: 0.0000e+00
Epoch 1051/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1052/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 1053/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1054/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1055/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1056/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
```

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.0026 - val_accuracy: 0.0000e+00
Epoch 1057/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0044 - val_accuracy: 0.0000e+00
Epoch 1058/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1059/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1060/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1061/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1062/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1063/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1064/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1065/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1066/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1067/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0060 - val_accuracy: 0.0000e+00
Epoch 1068/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0053 - val_accuracy: 0.0000e+00
Epoch 1069/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0059 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1070/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1071/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1072/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1073/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1074/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 1075/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 1076/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0057 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1077/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1078/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1079/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 1080/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 1081/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1082/1500
```

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32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1083/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1084/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1085/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1086/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0072 - val_accuracy: 0.0000e+00
Epoch 1087/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1088/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1089/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1090/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1091/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0061 - val_accuracy: 0.0000e+00
Epoch 1092/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1093/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1094/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1095/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1096/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1097/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1098/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0159 - val_accuracy: 0.0000e+00
Epoch 1099/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0092 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1100/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0057 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 1101/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1102/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1103/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0078 - val_accuracy: 0.0000e+00
Epoch 1104/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1105/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0093 - val_accuracy: 0.0000e+00
Epoch 1106/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1107/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
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Epoch 1108/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1109/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 1110/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 1111/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1112/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1113/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1114/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 1115/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 1116/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0078 - val_accuracy: 0.0000e+00
Epoch 1117/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1118/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1119/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1120/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0017 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1121/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1122/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 1123/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1124/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1125/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 1126/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1127/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1128/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0045 - val_accuracy: 0.0000e+00
Epoch 1129/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0054 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1130/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0054 - accuracy: 0.0000e+00 - val_loss: 0
.0094 - val_accuracy: 0.0000e+00
Epoch 1131/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0051 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1132/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1133/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
```

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.0034 - val_accuracy: 0.0000e+00
Epoch 1134/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1135/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1136/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0060 - val_accuracy: 0.0000e+00
Epoch 1137/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1138/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1139/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1140/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1141/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1142/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1143/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1144/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1145/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 1146/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1147/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1148/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 1149/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 1150/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 1151/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1152/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1153/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1154/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1155/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 1156/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0084 - val_accuracy: 0.0000e+00
Epoch 1157/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0056 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1158/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1159/1500
```

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32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 1160/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1161/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1162/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0017 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1163/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1164/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1165/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 1166/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0054 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1167/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1168/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0058 - val_accuracy: 0.0000e+00
Epoch 1169/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1170/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1171/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1172/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1173/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0141 - val_accuracy: 0.0000e+00
Epoch 1174/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0051 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1175/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1176/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1177/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1178/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1179/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1180/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1181/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 1182/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1183/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1184/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0082 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val accuracy: 0.0000e+00
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Epoch 1185/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0094 - accuracy: 0.0000e+00 - val_loss: 0
.0102 - val_accuracy: 0.0000e+00
Epoch 1186/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1187/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 1188/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1189/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1190/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0058 - val_accuracy: 0.0000e+00
Epoch 1191/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0125 - val_accuracy: 0.0000e+00
Epoch 1192/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0085 - accuracy: 0.0000e+00 - val_loss: 0
.0073 - val_accuracy: 0.0000e+00
Epoch 1193/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1194/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1195/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1196/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 1197/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1198/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1199/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1200/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1201/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1202/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0081 - val_accuracy: 0.0000e+00
Epoch 1203/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1204/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1205/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0056 - val_accuracy: 0.0000e+00
Epoch 1206/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1207/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0057 - val_accuracy: 0.0000e+00
Epoch 1208/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1209/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1210/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
```

.0018 - val_accuracy: 0.0000e+00
Epoch 1211/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1212/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1213/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1214/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1215/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1216/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1217/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1218/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0622 - val_accuracy: 0.0000e+00
Epoch 1219/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0151 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 1220/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1221/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1222/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1223/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1224/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1225/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1226/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 1227/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0240 - accuracy: 0.0000e+00 - val_loss: 0
.0075 - val_accuracy: 0.0000e+00
Epoch 1228/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0094 - accuracy: 0.0000e+00 - val_loss: 0
.0062 - val_accuracy: 0.0000e+00
Epoch 1229/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 1230/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0045 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1231/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1232/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1233/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1234/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1235/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1236/1500

32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1237/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1238/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1239/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1240/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1241/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1242/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1243/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0040 - val_accuracy: 0.0000e+00
Epoch 1244/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1245/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1246/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1247/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1248/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1249/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1250/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1251/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1252/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1253/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1254/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 1255/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0055 - val_accuracy: 0.0000e+00
Epoch 1256/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1257/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1258/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1259/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1260/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0051 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1261/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00

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Epoch 1262/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1263/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1264/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 1265/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1266/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1267/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1268/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1269/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1270/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1271/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1272/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0068 - val_accuracy: 0.0000e+00
Epoch 1273/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1274/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1275/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1276/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1277/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1278/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1279/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1280/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1281/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0073 - val_accuracy: 0.0000e+00
Epoch 1282/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0168 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 1283/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 1284/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1285/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1286/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0067 - val_accuracy: 0.0000e+00
Epoch 1287/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
```

.0041 - val_accuracy: 0.0000e+00
Epoch 1288/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 1289/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1290/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1291/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1292/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1293/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1294/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1295/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1296/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1297/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1298/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0044 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1299/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1300/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0043 - val_accuracy: 0.0000e+00
Epoch 1301/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1302/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1303/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1304/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1305/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1306/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
.0227 - val_accuracy: 0.0000e+00
Epoch 1307/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0057 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1308/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1309/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1310/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 1311/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1312/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0054 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 1313/1500

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Epoch 1313/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1314/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1315/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1316/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1317/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1318/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0078 - val_accuracy: 0.0000e+00
Epoch 1319/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1320/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1321/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1322/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1323/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1324/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1325/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 1326/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1327/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0123 - val_accuracy: 0.0000e+00
Epoch 1328/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1329/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1330/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0095 - val_accuracy: 0.0000e+00
Epoch 1331/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0133 - val_accuracy: 0.0000e+00
Epoch 1332/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0060 - accuracy: 0.0000e+00 - val_loss: 0
.0193 - val_accuracy: 0.0000e+00
Epoch 1333/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0299 - accuracy: 0.0000e+00 - val_loss: 0
.0269 - val_accuracy: 0.0000e+00
Epoch 1334/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0103 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1335/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1336/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1337/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1338/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
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.0051 - val_accuracy: 0.0000e+00
Epoch 1339/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 1340/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 1341/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1342/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1343/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1344/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1345/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1346/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1347/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1348/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0051 - val_accuracy: 0.0000e+00
Epoch 1349/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1350/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1351/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1352/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1353/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1354/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1355/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1356/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1357/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1358/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1359/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1360/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0038 - val_accuracy: 0.0000e+00
Epoch 1361/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0059 - val_accuracy: 0.0000e+00
Epoch 1362/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0100 - val_accuracy: 0.0000e+00
Epoch 1363/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0058 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1364/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0

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32/32 [==============================] - 0s 2ms/step - loss: 0.0043 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1365/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 1366/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1367/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1368/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0042 - accuracy: 0.0000e+00 - val_loss: 0
.0079 - val_accuracy: 0.0000e+00
Epoch 1369/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1370/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0027 - val_accuracy: 0.0000e+00
Epoch 1371/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0028 - val_accuracy: 0.0000e+00
Epoch 1372/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1373/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 1374/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1375/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1376/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1377/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0041 - accuracy: 0.0000e+00 - val_loss: 0
.0132 - val_accuracy: 0.0000e+00
Epoch 1378/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0038 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1379/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1380/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1381/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1382/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0048 - val_accuracy: 0.0000e+00
Epoch 1383/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0053 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 1384/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0070 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 1385/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1386/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1387/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0124 - val_accuracy: 0.0000e+00
Epoch 1388/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1389/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1390/1500
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Epoch 1390/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1391/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0041 - val_accuracy: 0.0000e+00
Epoch 1392/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1393/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1394/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 1395/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0061 - val_accuracy: 0.0000e+00
Epoch 1396/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1397/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0034 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1398/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1399/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0064 - val_accuracy: 0.0000e+00
Epoch 1400/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1401/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1402/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1403/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0077 - val_accuracy: 0.0000e+00
Epoch 1404/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0034 - val_accuracy: 0.0000e+00
Epoch 1405/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1406/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1407/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0050 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1408/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1409/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1410/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1411/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1412/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1413/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1414/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1415/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0047 - accuracy: 0.0000e+00 - val_loss: 0
```

.0075 - val_accuracy: 0.0000e+00
Epoch 1416/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0097 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1417/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1418/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1419/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 1420/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0026 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1421/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1422/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1423/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1424/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1425/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1426/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1427/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1428/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1429/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1430/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0062 - val_accuracy: 0.0000e+00
Epoch 1431/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0033 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1432/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1433/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0081 - val_accuracy: 0.0000e+00
Epoch 1434/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0035 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1435/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
Epoch 1436/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1437/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0049 - accuracy: 0.0000e+00 - val_loss: 0
.0070 - val_accuracy: 0.0000e+00
Epoch 1438/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0039 - accuracy: 0.0000e+00 - val_loss: 0
.0042 - val_accuracy: 0.0000e+00
Epoch 1439/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1440/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0077 - val_accuracy: 0.0000e+00
Epoch 1441/1500

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32/32 [==============================] - 0s 2ms/step - loss: 0.0054 - accuracy: 0.0000e+00 - val_loss: 0
.0103 - val_accuracy: 0.0000e+00
Epoch 1442/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0100 - accuracy: 0.0000e+00 - val_loss: 0
.0254 - val_accuracy: 0.0000e+00
Epoch 1443/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0055 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1444/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0028 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1445/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1446/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0031 - val_accuracy: 0.0000e+00
Epoch 1447/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1448/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1449/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0046 - val_accuracy: 0.0000e+00
Epoch 1450/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0036 - accuracy: 0.0000e+00 - val_loss: 0
.0025 - val_accuracy: 0.0000e+00
Epoch 1451/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0030 - accuracy: 0.0000e+00 - val_loss: 0
.0029 - val_accuracy: 0.0000e+00
Epoch 1452/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1453/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1454/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1455/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1456/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1457/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1458/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0037 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1459/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1460/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1461/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0024 - val_accuracy: 0.0000e+00
Epoch 1462/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1463/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1464/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1465/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0021 - val_accuracy: 0.0000e+00
Epoch 1466/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0029 - accuracy: 0.0000e+00 - val_loss: 0
.0050 - val_accuracy: 0.0000e+00
```

```
Epoch 1467/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Epoch 1468/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0032 - accuracy: 0.0000e+00 - val_loss: 0
.0047 - val_accuracy: 0.0000e+00
Epoch 1469/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1470/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1471/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0018 - val_accuracy: 0.0000e+00
Epoch 1472/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0017 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1473/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1474/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0032 - val_accuracy: 0.0000e+00
Epoch 1475/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0037 - val_accuracy: 0.0000e+00
Epoch 1476/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
.0054 - val_accuracy: 0.0000e+00
Epoch 1477/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0084 - accuracy: 0.0000e+00 - val_loss: 0
.0049 - val_accuracy: 0.0000e+00
Epoch 1478/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0052 - accuracy: 0.0000e+00 - val_loss: 0
.0035 - val_accuracy: 0.0000e+00
Epoch 1479/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1480/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0040 - accuracy: 0.0000e+00 - val_loss: 0
.0060 - val_accuracy: 0.0000e+00
Epoch 1481/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0046 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1482/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1483/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0019 - val_accuracy: 0.0000e+00
Epoch 1484/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0018 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1485/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0026 - val_accuracy: 0.0000e+00
Epoch 1486/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0031 - accuracy: 0.0000e+00 - val_loss: 0
.0030 - val_accuracy: 0.0000e+00
Epoch 1487/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0023 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1488/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0017 - val_accuracy: 0.0000e+00
Epoch 1489/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0027 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1490/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0022 - val_accuracy: 0.0000e+00
Epoch 1491/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1492/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0021 - accuracy: 0.0000e+00 - val_loss: 0
```

```
.0028 - val_accuracy: 0.0000e+00
Epoch 1493/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0025 - accuracy: 0.0000e+00 - val_loss: 0
.0033 - val_accuracy: 0.0000e+00
Epoch 1494/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0024 - accuracy: 0.0000e+00 - val_loss: 0
.0020 - val_accuracy: 0.0000e+00
Epoch 1495/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0022 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1496/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0128 - accuracy: 0.0000e+00 - val_loss: 0
.0071 - val_accuracy: 0.0000e+00
Epoch 1497/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0170 - accuracy: 0.0000e+00 - val_loss: 0
.0039 - val_accuracy: 0.0000e+00
Epoch 1498/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0048 - accuracy: 0.0000e+00 - val_loss: 0
.0023 - val_accuracy: 0.0000e+00
Epoch 1499/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0019 - accuracy: 0.0000e+00 - val_loss: 0
.0016 - val_accuracy: 0.0000e+00
Epoch 1500/1500
32/32 [==============================] - 0s 2ms/step - loss: 0.0020 - accuracy: 0.0000e+00 - val_loss: 0
.0036 - val_accuracy: 0.0000e+00
Model: "sequential_34"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
dense_layer_103 (DenseLayer) (None, 8)                 16
_________________________________________________________________
dense_layer_104 (DenseLayer) (None, 8)                 72
_________________________________________________________________
dense_layer_105 (DenseLayer) (None, 8)                 72
_________________________________________________________________
dense_layer_106 (DenseLayer) (None, 1)                 9
=================================================================
Total params: 169
Trainable params: 169
Non-trainable params: 0
_________________________________________________________________
```

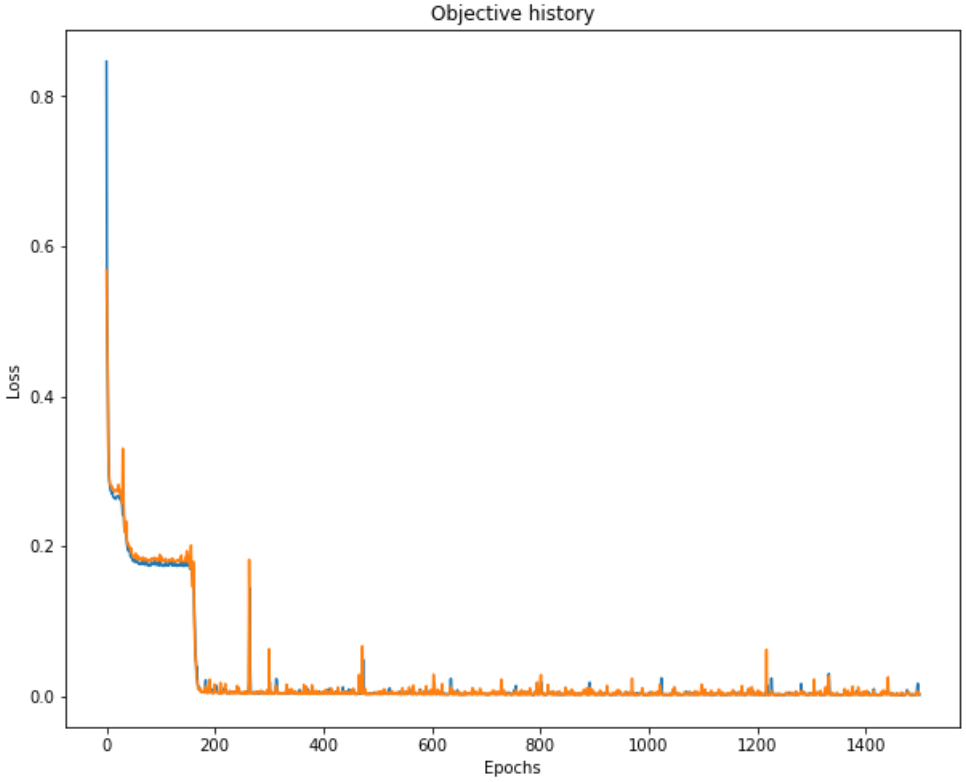
### Plot training trace and the fitted model

In [81]:

```
# Plot the loss function and train / validation accuracies
plt.subplot(1, 1, 1)
plt.plot(history.history['loss'], label='train')
plt.plot(history.history['val_loss'], label='val')
plt.title('Objective history')
plt.xlabel('Epochs')
plt.ylabel('Loss')
```

Out[81]:

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



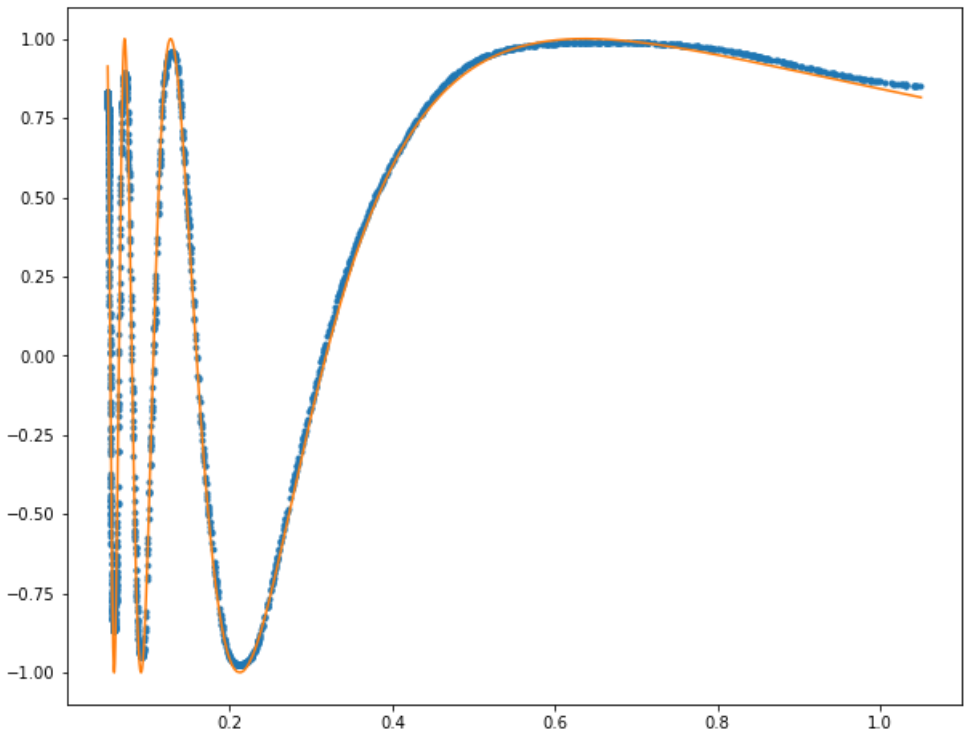

In [82]:

```
y_pred = model.predict(x_val)
plt.plot(x_val[:, 0], y_pred[:, 0], '.')

# actual values
plt.plot(x_train[sort_ind, 0], y_train[sort_ind, 0])
# plt.plot(x_val[:, 0], y_val[:, 0], '.')
```

Out[82]:

```
[<matplotlib.lines.Line2D at 0x2190e58a148>]
```




## Save the model

Please save your model as follows. Make sure the saved model can be loaded correctly with `tf.keras.models.load_model('sin_inv_x.kmod')` . *If your model cannot be loaded, you will get zero points for this problem.*

In [83]:

```
model.save('sin_inv_x.kmod')
```

```
INFO:tensorflow:Assets written to: sin_inv_x.kmod\assets
```

## 3. Classifying hand-written digits

This task is a classification problem on the famous MNIST dataset.

### Load the data

In [39]:

```
from sklearn.model_selection import train_test_split

# load the dataset
data_train, data_test = tf.keras.datasets.mnist.load_data()

# separate a validation set
x_train, y_train = data_train
x_train, x_val, y_train, y_val = train_test_split(x_train, y_train, train_size=0.8, stratify=y_train)

x_test, y_test = data_test

# treating images as vectors and create one hot representations of labesl

x_train = x_train.reshape([-1, 28 * 28])
x_val = x_val.reshape([-1, 28 * 28])
x_test = x_test.reshape([-1, 28 * 28])

y_train = tf.one_hot(y_train, depth=10).numpy()
y_val = tf.one_hot(y_val, depth=10).numpy()
y_test = tf.one_hot(y_test, depth=10).numpy()


print('Shape of training input: ', x_train.shape)
print('Shape of training labels: ', y_train.shape)
print('Shape of validation input: ', x_val.shape)
print('Shape of validation labels: ', y_val.shape)
print('Shape of test input: ', x_test.shape)
print('Shape of test labels: ', y_test.shape)
```

```
Shape of training input:  (48000, 784)
Shape of training labels:  (48000, 10)
Shape of validation input:  (12000, 784)
Shape of validation labels:  (12000, 10)
Shape of test input:  (10000, 784)
Shape of test labels:  (10000, 10)
```

In [40]:

```
#Test
print(tf.shape(x_train))
```

```
tf.Tensor([48000   784], shape=(2,), dtype=int32)
```

### Train a model

In [73]:

```
from implementation import train

#default - was able to get >90% accuracy with default training settings
# model, history = train(x_train, y_train, x_val, y_val, depth=3, hidden_sizes=[8, 8], reg_weight=0.01, 

#debug
model, history = train(x_train, y_train, x_val, y_val, depth=3, hidden_sizes=[10, 10], reg_weight=0.01, nu
```

```
Epoch 1/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.1003 - accuracy: 0.1778 - val_loss: 0.0
915 - val_accuracy: 0.1958
Epoch 2/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0883 - accuracy: 0.2050 - val_loss: 0.0
859 - val_accuracy: 0.2282
Epoch 3/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0826 - accuracy: 0.2697 - val_loss: 0.0
782 - val_accuracy: 0.3212
```

```
Epoch 4/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0756 - accuracy: 0.3570 - val_loss: 0.0
730 - val_accuracy: 0.3840
Epoch 5/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0681 - accuracy: 0.4325 - val_loss: 0.0
613 - val_accuracy: 0.5139
Epoch 6/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0580 - accuracy: 0.5557 - val_loss: 0.0
569 - val_accuracy: 0.5803
Epoch 7/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0527 - accuracy: 0.6190 - val_loss: 0.0
509 - val_accuracy: 0.6432
Epoch 8/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0452 - accuracy: 0.7028 - val_loss: 0.0
399 - val_accuracy: 0.7482
Epoch 9/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0373 - accuracy: 0.7722 - val_loss: 0.0
341 - val_accuracy: 0.7969
Epoch 10/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0326 - accuracy: 0.8054 - val_loss: 0.0
310 - val_accuracy: 0.8163
Epoch 11/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0286 - accuracy: 0.8306 - val_loss: 0.0
282 - val_accuracy: 0.8340
Epoch 12/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0264 - accuracy: 0.8443 - val_loss: 0.0
250 - val_accuracy: 0.8533
Epoch 13/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0237 - accuracy: 0.8607 - val_loss: 0.0
247 - val_accuracy: 0.8562
Epoch 14/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0222 - accuracy: 0.8705 - val_loss: 0.0
227 - val_accuracy: 0.8681
Epoch 15/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0208 - accuracy: 0.8791 - val_loss: 0.0
227 - val_accuracy: 0.8683
Epoch 16/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0197 - accuracy: 0.8857 - val_loss: 0.0
202 - val_accuracy: 0.8830
Epoch 17/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0190 - accuracy: 0.8894 - val_loss: 0.0
203 - val_accuracy: 0.8826
Epoch 18/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0184 - accuracy: 0.8932 - val_loss: 0.0
192 - val_accuracy: 0.8891
Epoch 19/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0179 - accuracy: 0.8958 - val_loss: 0.0
189 - val_accuracy: 0.8896
Epoch 20/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0174 - accuracy: 0.8984 - val_loss: 0.0
209 - val_accuracy: 0.8790
Epoch 21/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0170 - accuracy: 0.9004 - val_loss: 0.0
182 - val_accuracy: 0.8943
Epoch 22/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0162 - accuracy: 0.9054 - val_loss: 0.0
176 - val_accuracy: 0.8971
Epoch 23/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0162 - accuracy: 0.9045 - val_loss: 0.0
174 - val_accuracy: 0.8982
Epoch 24/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0157 - accuracy: 0.9085 - val_loss: 0.0
172 - val_accuracy: 0.8996
Epoch 25/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0155 - accuracy: 0.9095 - val_loss: 0.0
164 - val_accuracy: 0.9060
Epoch 26/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0152 - accuracy: 0.9098 - val_loss: 0.0
177 - val_accuracy: 0.8958
Epoch 27/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0151 - accuracy: 0.9111 - val_loss: 0.0
158 - val_accuracy: 0.9084
Epoch 28/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0146 - accuracy: 0.9142 - val_loss: 0.0
161 - val_accuracy: 0.9053
Epoch 29/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0143 - accuracy: 0.9156 - val_loss: 0.0
```

```
165 - val_accuracy: 0.9038
Epoch 30/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0145 - accuracy: 0.9145 - val_loss: 0.0
163 - val_accuracy: 0.9043
Epoch 31/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0140 - accuracy: 0.9171 - val_loss: 0.0
156 - val_accuracy: 0.9086
Epoch 32/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0138 - accuracy: 0.9186 - val_loss: 0.0
158 - val_accuracy: 0.9057
Epoch 33/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0137 - accuracy: 0.9190 - val_loss: 0.0
153 - val_accuracy: 0.9096
Epoch 34/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0134 - accuracy: 0.9202 - val_loss: 0.0
154 - val_accuracy: 0.9100
Epoch 35/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0132 - accuracy: 0.9216 - val_loss: 0.0
155 - val_accuracy: 0.9087
Epoch 36/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0133 - accuracy: 0.9216 - val_loss: 0.0
151 - val_accuracy: 0.9119
Epoch 37/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0130 - accuracy: 0.9233 - val_loss: 0.0
148 - val_accuracy: 0.9119
Epoch 38/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0128 - accuracy: 0.9239 - val_loss: 0.0
154 - val_accuracy: 0.9091
Epoch 39/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0127 - accuracy: 0.9244 - val_loss: 0.0
147 - val_accuracy: 0.9138
Epoch 40/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0125 - accuracy: 0.9256 - val_loss: 0.0
153 - val_accuracy: 0.9095
Epoch 41/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0123 - accuracy: 0.9266 - val_loss: 0.0
147 - val_accuracy: 0.9129
Epoch 42/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0123 - accuracy: 0.9266 - val_loss: 0.0
144 - val_accuracy: 0.9149
Epoch 43/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0122 - accuracy: 0.9271 - val_loss: 0.0
144 - val_accuracy: 0.9136
Epoch 44/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0121 - accuracy: 0.9287 - val_loss: 0.0
144 - val_accuracy: 0.9134
Epoch 45/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0119 - accuracy: 0.9288 - val_loss: 0.0
149 - val_accuracy: 0.9110
Epoch 46/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0119 - accuracy: 0.9292 - val_loss: 0.0
147 - val_accuracy: 0.9113
Epoch 47/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0119 - accuracy: 0.9293 - val_loss: 0.0
139 - val_accuracy: 0.9168
Epoch 48/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0118 - accuracy: 0.9294 - val_loss: 0.0
144 - val_accuracy: 0.9143
Epoch 49/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0117 - accuracy: 0.9306 - val_loss: 0.0
139 - val_accuracy: 0.9166
Epoch 50/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0113 - accuracy: 0.9323 - val_loss: 0.0
141 - val_accuracy: 0.9163
Epoch 51/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0116 - accuracy: 0.9302 - val_loss: 0.0
138 - val_accuracy: 0.9182
Epoch 52/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0113 - accuracy: 0.9323 - val_loss: 0.0
139 - val_accuracy: 0.9176
Epoch 53/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0113 - accuracy: 0.9320 - val_loss: 0.0
138 - val_accuracy: 0.9178
Epoch 54/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0112 - accuracy: 0.9325 - val_loss: 0.0
136 - val_accuracy: 0.9177
Epoch 55/1000
```

```
375/375 [==============================] - 1s 2ms/step - loss: 0.0112 - accuracy: 0.9336 - val_loss: 0.0
142 - val_accuracy: 0.9157
Epoch 56/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0110 - accuracy: 0.9338 - val_loss: 0.0
138 - val_accuracy: 0.9170
Epoch 57/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0108 - accuracy: 0.9358 - val_loss: 0.0
136 - val_accuracy: 0.9182
Epoch 58/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0107 - accuracy: 0.9356 - val_loss: 0.0
132 - val_accuracy: 0.9208
Epoch 59/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0108 - accuracy: 0.9357 - val_loss: 0.0
137 - val_accuracy: 0.9180
Epoch 60/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0108 - accuracy: 0.9348 - val_loss: 0.0
138 - val_accuracy: 0.9172
Epoch 61/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0105 - accuracy: 0.9369 - val_loss: 0.0
133 - val_accuracy: 0.9211
Epoch 62/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0104 - accuracy: 0.9375 - val_loss: 0.0
131 - val_accuracy: 0.9209
Epoch 63/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0105 - accuracy: 0.9364 - val_loss: 0.0
126 - val_accuracy: 0.9252
Epoch 64/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0103 - accuracy: 0.9383 - val_loss: 0.0
129 - val_accuracy: 0.9212
Epoch 65/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0103 - accuracy: 0.9376 - val_loss: 0.0
128 - val_accuracy: 0.9230
Epoch 66/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0103 - accuracy: 0.9377 - val_loss: 0.0
128 - val_accuracy: 0.9227
Epoch 67/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0102 - accuracy: 0.9384 - val_loss: 0.0
128 - val_accuracy: 0.9224
Epoch 68/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0101 - accuracy: 0.9389 - val_loss: 0.0
129 - val_accuracy: 0.9223
Epoch 69/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0099 - accuracy: 0.9399 - val_loss: 0.0
132 - val_accuracy: 0.9205
Epoch 70/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0100 - accuracy: 0.9396 - val_loss: 0.0
127 - val_accuracy: 0.9233
Epoch 71/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0098 - accuracy: 0.9406 - val_loss: 0.0
123 - val_accuracy: 0.9262
Epoch 72/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0097 - accuracy: 0.9413 - val_loss: 0.0
123 - val_accuracy: 0.9252
Epoch 73/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0097 - accuracy: 0.9409 - val_loss: 0.0
124 - val_accuracy: 0.9252
Epoch 74/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0096 - accuracy: 0.9421 - val_loss: 0.0
128 - val_accuracy: 0.9228
Epoch 75/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0096 - accuracy: 0.9418 - val_loss: 0.0
123 - val_accuracy: 0.9253
Epoch 76/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0095 - accuracy: 0.9423 - val_loss: 0.0
123 - val_accuracy: 0.9252
Epoch 77/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0095 - accuracy: 0.9427 - val_loss: 0.0
121 - val_accuracy: 0.9276
Epoch 78/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0094 - accuracy: 0.9426 - val_loss: 0.0
122 - val_accuracy: 0.9260
Epoch 79/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0094 - accuracy: 0.9429 - val_loss: 0.0
122 - val_accuracy: 0.9269
Epoch 80/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0093 - accuracy: 0.9434 - val_loss: 0.0
120 - val_accuracy: 0.9279
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Epoch 81/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0092 - accuracy: 0.9435 - val_loss: 0.0
119 - val_accuracy: 0.9289
Epoch 82/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0092 - accuracy: 0.9438 - val_loss: 0.0
120 - val_accuracy: 0.9275
Epoch 83/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0092 - accuracy: 0.9446 - val_loss: 0.0
121 - val_accuracy: 0.9274
Epoch 84/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0091 - accuracy: 0.9452 - val_loss: 0.0
122 - val_accuracy: 0.9265
Epoch 85/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0092 - accuracy: 0.9439 - val_loss: 0.0
116 - val_accuracy: 0.9307
Epoch 86/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0091 - accuracy: 0.9452 - val_loss: 0.0
118 - val_accuracy: 0.9283
Epoch 87/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0089 - accuracy: 0.9459 - val_loss: 0.0
118 - val_accuracy: 0.9294
Epoch 88/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0090 - accuracy: 0.9446 - val_loss: 0.0
121 - val_accuracy: 0.9258
Epoch 89/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0088 - accuracy: 0.9464 - val_loss: 0.0
119 - val_accuracy: 0.9277
Epoch 90/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0088 - accuracy: 0.9470 - val_loss: 0.0
121 - val_accuracy: 0.9276
Epoch 91/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0088 - accuracy: 0.9461 - val_loss: 0.0
118 - val_accuracy: 0.9284
Epoch 92/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0088 - accuracy: 0.9465 - val_loss: 0.0
116 - val_accuracy: 0.9298
Epoch 93/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0087 - accuracy: 0.9473 - val_loss: 0.0
115 - val_accuracy: 0.9300
Epoch 94/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0086 - accuracy: 0.9480 - val_loss: 0.0
119 - val_accuracy: 0.9288
Epoch 95/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0086 - accuracy: 0.9470 - val_loss: 0.0
116 - val_accuracy: 0.9301
Epoch 96/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0087 - accuracy: 0.9465 - val_loss: 0.0
114 - val_accuracy: 0.9302
Epoch 97/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0086 - accuracy: 0.9478 - val_loss: 0.0
116 - val_accuracy: 0.9289
Epoch 98/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0085 - accuracy: 0.9482 - val_loss: 0.0
117 - val_accuracy: 0.9290
Epoch 99/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0085 - accuracy: 0.9482 - val_loss: 0.0
116 - val_accuracy: 0.9296
Epoch 100/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0085 - accuracy: 0.9481 - val_loss: 0.0
113 - val_accuracy: 0.9321
Epoch 101/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0083 - accuracy: 0.9492 - val_loss: 0.0
117 - val_accuracy: 0.9283
Epoch 102/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0085 - accuracy: 0.9485 - val_loss: 0.0
116 - val_accuracy: 0.9297
Epoch 103/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0085 - accuracy: 0.9486 - val_loss: 0.0
116 - val_accuracy: 0.9298
Epoch 104/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0084 - accuracy: 0.9495 - val_loss: 0.0
119 - val_accuracy: 0.9279
Epoch 105/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0083 - accuracy: 0.9494 - val_loss: 0.0
114 - val_accuracy: 0.9301
Epoch 106/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0083 - accuracy: 0.9497 - val_loss: 0.0
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117 - val_accuracy: 0.9295
Epoch 107/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0083 - accuracy: 0.9488 - val_loss: 0.0
115 - val_accuracy: 0.9301
Epoch 108/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0082 - accuracy: 0.9493 - val_loss: 0.0
117 - val_accuracy: 0.9295
Epoch 109/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0082 - accuracy: 0.9500 - val_loss: 0.0
117 - val_accuracy: 0.9289
Epoch 110/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0082 - accuracy: 0.9494 - val_loss: 0.0
113 - val_accuracy: 0.9318
Epoch 111/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0081 - accuracy: 0.9506 - val_loss: 0.0
115 - val_accuracy: 0.9304
Epoch 112/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0081 - accuracy: 0.9510 - val_loss: 0.0
113 - val_accuracy: 0.9305
Epoch 113/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0082 - accuracy: 0.9498 - val_loss: 0.0
112 - val_accuracy: 0.9317
Epoch 114/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0080 - accuracy: 0.9511 - val_loss: 0.0
118 - val_accuracy: 0.9296
Epoch 115/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0081 - accuracy: 0.9510 - val_loss: 0.0
113 - val_accuracy: 0.9304
Epoch 116/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0081 - accuracy: 0.9508 - val_loss: 0.0
117 - val_accuracy: 0.9307
Epoch 117/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0080 - accuracy: 0.9511 - val_loss: 0.0
116 - val_accuracy: 0.9296
Epoch 118/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0081 - accuracy: 0.9502 - val_loss: 0.0
112 - val_accuracy: 0.9325
Epoch 119/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0080 - accuracy: 0.9513 - val_loss: 0.0
116 - val_accuracy: 0.9304
Epoch 120/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0079 - accuracy: 0.9521 - val_loss: 0.0
113 - val_accuracy: 0.9323
Epoch 121/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0079 - accuracy: 0.9519 - val_loss: 0.0
114 - val_accuracy: 0.9308
Epoch 122/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0081 - accuracy: 0.9505 - val_loss: 0.0
115 - val_accuracy: 0.9301
Epoch 123/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0078 - accuracy: 0.9526 - val_loss: 0.0
114 - val_accuracy: 0.9321
Epoch 124/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0078 - accuracy: 0.9524 - val_loss: 0.0
112 - val_accuracy: 0.9317
Epoch 125/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0079 - accuracy: 0.9522 - val_loss: 0.0
112 - val_accuracy: 0.9327
Epoch 126/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0078 - accuracy: 0.9524 - val_loss: 0.0
110 - val_accuracy: 0.9337
Epoch 127/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0079 - accuracy: 0.9521 - val_loss: 0.0
117 - val_accuracy: 0.9294
Epoch 128/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0077 - accuracy: 0.9526 - val_loss: 0.0
112 - val_accuracy: 0.9326
Epoch 129/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0078 - accuracy: 0.9527 - val_loss: 0.0
114 - val_accuracy: 0.9310
Epoch 130/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0078 - accuracy: 0.9524 - val_loss: 0.0
115 - val_accuracy: 0.9294
Epoch 131/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0077 - accuracy: 0.9530 - val_loss: 0.0
112 - val_accuracy: 0.9329
Epoch 132/1000
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375/375 [==============================] - 1s 2ms/step - loss: 0.0076 - accuracy: 0.9539 - val_loss: 0.0
111 - val_accuracy: 0.9323
Epoch 133/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0076 - accuracy: 0.9539 - val_loss: 0.0
112 - val_accuracy: 0.9315
Epoch 134/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0078 - accuracy: 0.9520 - val_loss: 0.0
113 - val_accuracy: 0.9310
Epoch 135/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0076 - accuracy: 0.9545 - val_loss: 0.0
114 - val_accuracy: 0.9305
Epoch 136/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0075 - accuracy: 0.9539 - val_loss: 0.0
110 - val_accuracy: 0.9338
Epoch 137/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0075 - accuracy: 0.9538 - val_loss: 0.0
111 - val_accuracy: 0.9331
Epoch 138/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0074 - accuracy: 0.9543 - val_loss: 0.0
109 - val_accuracy: 0.9337
Epoch 139/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0075 - accuracy: 0.9536 - val_loss: 0.0
112 - val_accuracy: 0.9328
Epoch 140/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0074 - accuracy: 0.9551 - val_loss: 0.0
112 - val_accuracy: 0.9323
Epoch 141/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0076 - accuracy: 0.9536 - val_loss: 0.0
111 - val_accuracy: 0.9330
Epoch 142/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0074 - accuracy: 0.9548 - val_loss: 0.0
110 - val_accuracy: 0.9337
Epoch 143/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0074 - accuracy: 0.9542 - val_loss: 0.0
111 - val_accuracy: 0.9327
Epoch 144/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0074 - accuracy: 0.9548 - val_loss: 0.0
109 - val_accuracy: 0.9339
Epoch 145/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0076 - accuracy: 0.9533 - val_loss: 0.0
110 - val_accuracy: 0.9331
Epoch 146/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0074 - accuracy: 0.9552 - val_loss: 0.0
111 - val_accuracy: 0.9334
Epoch 147/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0074 - accuracy: 0.9549 - val_loss: 0.0
109 - val_accuracy: 0.9346
Epoch 148/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0073 - accuracy: 0.9560 - val_loss: 0.0
112 - val_accuracy: 0.9323
Epoch 149/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0073 - accuracy: 0.9559 - val_loss: 0.0
114 - val_accuracy: 0.9315
Epoch 150/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0073 - accuracy: 0.9554 - val_loss: 0.0
109 - val_accuracy: 0.9344
Epoch 151/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0075 - accuracy: 0.9544 - val_loss: 0.0
113 - val_accuracy: 0.9312
Epoch 152/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0073 - accuracy: 0.9550 - val_loss: 0.0
108 - val_accuracy: 0.9348
Epoch 153/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0073 - accuracy: 0.9558 - val_loss: 0.0
110 - val_accuracy: 0.9326
Epoch 154/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0074 - accuracy: 0.9547 - val_loss: 0.0
110 - val_accuracy: 0.9341
Epoch 155/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9559 - val_loss: 0.0
108 - val_accuracy: 0.9342
Epoch 156/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0073 - accuracy: 0.9550 - val_loss: 0.0
111 - val_accuracy: 0.9323
Epoch 157/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9557 - val_loss: 0.0
110 - val accuracy: 0.9349
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Epoch 158/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0071 - accuracy: 0.9569 - val_loss: 0.0
113 - val_accuracy: 0.9306
Epoch 159/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9563 - val_loss: 0.0
114 - val_accuracy: 0.9309
Epoch 160/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0073 - accuracy: 0.9560 - val_loss: 0.0
111 - val_accuracy: 0.9323
Epoch 161/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9559 - val_loss: 0.0
110 - val_accuracy: 0.9325
Epoch 162/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0071 - accuracy: 0.9565 - val_loss: 0.0
109 - val_accuracy: 0.9334
Epoch 163/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9560 - val_loss: 0.0
108 - val_accuracy: 0.9340
Epoch 164/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0071 - accuracy: 0.9565 - val_loss: 0.0
112 - val_accuracy: 0.9312
Epoch 165/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9562 - val_loss: 0.0
110 - val_accuracy: 0.9341
Epoch 166/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0073 - accuracy: 0.9548 - val_loss: 0.0
109 - val_accuracy: 0.9346
Epoch 167/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9557 - val_loss: 0.0
110 - val_accuracy: 0.9336
Epoch 168/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9556 - val_loss: 0.0
108 - val_accuracy: 0.9345
Epoch 169/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0070 - accuracy: 0.9566 - val_loss: 0.0
110 - val_accuracy: 0.9344
Epoch 170/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0070 - accuracy: 0.9576 - val_loss: 0.0
109 - val_accuracy: 0.9349
Epoch 171/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0071 - accuracy: 0.9561 - val_loss: 0.0
108 - val_accuracy: 0.9342
Epoch 172/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9560 - val_loss: 0.0
108 - val_accuracy: 0.9348
Epoch 173/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0071 - accuracy: 0.9568 - val_loss: 0.0
110 - val_accuracy: 0.9331
Epoch 174/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0070 - accuracy: 0.9572 - val_loss: 0.0
110 - val_accuracy: 0.9326
Epoch 175/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0071 - accuracy: 0.9567 - val_loss: 0.0
109 - val_accuracy: 0.9333
Epoch 176/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0070 - accuracy: 0.9564 - val_loss: 0.0
109 - val_accuracy: 0.9329
Epoch 177/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0070 - accuracy: 0.9576 - val_loss: 0.0
109 - val_accuracy: 0.9349
Epoch 178/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9579 - val_loss: 0.0
108 - val_accuracy: 0.9342
Epoch 179/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0072 - accuracy: 0.9562 - val_loss: 0.0
108 - val_accuracy: 0.9349
Epoch 180/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9585 - val_loss: 0.0
110 - val_accuracy: 0.9335
Epoch 181/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9586 - val_loss: 0.0
106 - val_accuracy: 0.9358
Epoch 182/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9585 - val_loss: 0.0
107 - val_accuracy: 0.9344
Epoch 183/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9586 - val_loss: 0.0
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109 - val_accuracy: 0.9335
Epoch 184/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9582 - val_loss: 0.0
110 - val_accuracy: 0.9334
Epoch 185/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9579 - val_loss: 0.0
108 - val_accuracy: 0.9350
Epoch 186/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9596 - val_loss: 0.0
107 - val_accuracy: 0.9346
Epoch 187/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0070 - accuracy: 0.9583 - val_loss: 0.0
106 - val_accuracy: 0.9358
Epoch 188/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9587 - val_loss: 0.0
107 - val_accuracy: 0.9352
Epoch 189/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9589 - val_loss: 0.0
110 - val_accuracy: 0.9342
Epoch 190/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9581 - val_loss: 0.0
108 - val_accuracy: 0.9346
Epoch 191/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9581 - val_loss: 0.0
108 - val_accuracy: 0.9353
Epoch 192/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9584 - val_loss: 0.0
108 - val_accuracy: 0.9348
Epoch 193/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9585 - val_loss: 0.0
109 - val_accuracy: 0.9339
Epoch 194/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9589 - val_loss: 0.0
106 - val_accuracy: 0.9359
Epoch 195/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9592 - val_loss: 0.0
109 - val_accuracy: 0.9335
Epoch 196/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9584 - val_loss: 0.0
107 - val_accuracy: 0.9356
Epoch 197/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9590 - val_loss: 0.0
109 - val_accuracy: 0.9330
Epoch 198/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9588 - val_loss: 0.0
107 - val_accuracy: 0.9359
Epoch 199/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0069 - accuracy: 0.9586 - val_loss: 0.0
107 - val_accuracy: 0.9346
Epoch 200/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9600 - val_loss: 0.0
109 - val_accuracy: 0.9339
Epoch 201/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9586 - val_loss: 0.0
108 - val_accuracy: 0.9348
Epoch 202/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9591 - val_loss: 0.0
108 - val_accuracy: 0.9339
Epoch 203/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9595 - val_loss: 0.0
106 - val_accuracy: 0.9352
Epoch 204/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9587 - val_loss: 0.0
107 - val_accuracy: 0.9343
Epoch 205/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9600 - val_loss: 0.0
105 - val_accuracy: 0.9358
Epoch 206/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9590 - val_loss: 0.0
108 - val_accuracy: 0.9357
Epoch 207/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9592 - val_loss: 0.0
108 - val_accuracy: 0.9346
Epoch 208/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0068 - accuracy: 0.9589 - val_loss: 0.0
108 - val_accuracy: 0.9342
Epoch 209/1000

Epoch 209/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9595 - val_loss: 0.0
110 - val_accuracy: 0.9337
Epoch 210/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9598 - val_loss: 0.0
109 - val_accuracy: 0.9340
Epoch 211/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9594 - val_loss: 0.0
108 - val_accuracy: 0.9331
Epoch 212/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9591 - val_loss: 0.0
108 - val_accuracy: 0.9340
Epoch 213/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9597 - val_loss: 0.0
105 - val_accuracy: 0.9356
Epoch 214/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9596 - val_loss: 0.0
105 - val_accuracy: 0.9361
Epoch 215/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9596 - val_loss: 0.0
107 - val_accuracy: 0.9360
Epoch 216/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9595 - val_loss: 0.0
106 - val_accuracy: 0.9351
Epoch 217/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9594 - val_loss: 0.0
107 - val_accuracy: 0.9354
Epoch 218/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9599 - val_loss: 0.0
108 - val_accuracy: 0.9344
Epoch 219/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9607 - val_loss: 0.0
108 - val_accuracy: 0.9343
Epoch 220/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9593 - val_loss: 0.0
108 - val_accuracy: 0.9352
Epoch 221/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9602 - val_loss: 0.0
106 - val_accuracy: 0.9365
Epoch 222/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9596 - val_loss: 0.0
108 - val_accuracy: 0.9347
Epoch 223/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9604 - val_loss: 0.0
107 - val_accuracy: 0.9347
Epoch 224/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0067 - accuracy: 0.9597 - val_loss: 0.0
109 - val_accuracy: 0.9345
Epoch 225/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9611 - val_loss: 0.0
106 - val_accuracy: 0.9353
Epoch 226/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9600 - val_loss: 0.0
109 - val_accuracy: 0.9347
Epoch 227/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9597 - val_loss: 0.0
106 - val_accuracy: 0.9362
Epoch 228/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9606 - val_loss: 0.0
108 - val_accuracy: 0.9357
Epoch 229/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9606 - val_loss: 0.0
106 - val_accuracy: 0.9362
Epoch 230/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9605 - val_loss: 0.0
108 - val_accuracy: 0.9349
Epoch 231/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9601 - val_loss: 0.0
109 - val_accuracy: 0.9337
Epoch 232/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9607 - val_loss: 0.0
106 - val_accuracy: 0.9367
Epoch 233/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9607 - val_loss: 0.0
106 - val_accuracy: 0.9354
Epoch 234/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9603 - val_loss: 0.0
110 - val_accuracy: 0.9346

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110 - val_accuracy: 0.9370
Epoch 235/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9593 - val_loss: 0.0
105 - val_accuracy: 0.9366
Epoch 236/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9614 - val_loss: 0.0
105 - val_accuracy: 0.9362
Epoch 237/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9618 - val_loss: 0.0
104 - val_accuracy: 0.9366
Epoch 238/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9615 - val_loss: 0.0
106 - val_accuracy: 0.9372
Epoch 239/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9611 - val_loss: 0.0
106 - val_accuracy: 0.9362
Epoch 240/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9609 - val_loss: 0.0
108 - val_accuracy: 0.9352
Epoch 241/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9618 - val_loss: 0.0
105 - val_accuracy: 0.9373
Epoch 242/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9622 - val_loss: 0.0
109 - val_accuracy: 0.9348
Epoch 243/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9606 - val_loss: 0.0
104 - val_accuracy: 0.9377
Epoch 244/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9602 - val_loss: 0.0
106 - val_accuracy: 0.9362
Epoch 245/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9614 - val_loss: 0.0
108 - val_accuracy: 0.9348
Epoch 246/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9616 - val_loss: 0.0
107 - val_accuracy: 0.9366
Epoch 247/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9616 - val_loss: 0.0
108 - val_accuracy: 0.9350
Epoch 248/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9606 - val_loss: 0.0
107 - val_accuracy: 0.9346
Epoch 249/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9617 - val_loss: 0.0
107 - val_accuracy: 0.9357
Epoch 250/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9620 - val_loss: 0.0
106 - val_accuracy: 0.9363
Epoch 251/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9615 - val_loss: 0.0
108 - val_accuracy: 0.9351
Epoch 252/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0065 - accuracy: 0.9611 - val_loss: 0.0
107 - val_accuracy: 0.9358
Epoch 253/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9614 - val_loss: 0.0
110 - val_accuracy: 0.9337
Epoch 254/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9621 - val_loss: 0.0
109 - val_accuracy: 0.9342
Epoch 255/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0066 - accuracy: 0.9601 - val_loss: 0.0
109 - val_accuracy: 0.9345
Epoch 256/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9613 - val_loss: 0.0
108 - val_accuracy: 0.9357
Epoch 257/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9614 - val_loss: 0.0
110 - val_accuracy: 0.9337
Epoch 258/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9616 - val_loss: 0.0
107 - val_accuracy: 0.9346
Epoch 259/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9622 - val_loss: 0.0
109 - val_accuracy: 0.9342
Epoch 260/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9619 - val_loss: 0.0
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375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9619 - val_loss: 0.0
106 - val_accuracy: 0.9362
Epoch 261/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9621 - val_loss: 0.0
108 - val_accuracy: 0.9348
Epoch 262/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9620 - val_loss: 0.0
107 - val_accuracy: 0.9352
Epoch 263/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9608 - val_loss: 0.0
108 - val_accuracy: 0.9352
Epoch 264/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9625 - val_loss: 0.0
105 - val_accuracy: 0.9376
Epoch 265/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9613 - val_loss: 0.0
106 - val_accuracy: 0.9367
Epoch 266/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9610 - val_loss: 0.0
106 - val_accuracy: 0.9369
Epoch 267/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9625 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 268/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9622 - val_loss: 0.0
107 - val_accuracy: 0.9348
Epoch 269/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9619 - val_loss: 0.0
105 - val_accuracy: 0.9378
Epoch 270/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9616 - val_loss: 0.0
107 - val_accuracy: 0.9360
Epoch 271/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0064 - accuracy: 0.9616 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 272/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9618 - val_loss: 0.0
111 - val_accuracy: 0.9350
Epoch 273/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9620 - val_loss: 0.0
107 - val_accuracy: 0.9361
Epoch 274/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9619 - val_loss: 0.0
106 - val_accuracy: 0.9364
Epoch 275/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9617 - val_loss: 0.0
108 - val_accuracy: 0.9357
Epoch 276/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9621 - val_loss: 0.0
106 - val_accuracy: 0.9354
Epoch 277/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9627 - val_loss: 0.0
107 - val_accuracy: 0.9352
Epoch 278/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9622 - val_loss: 0.0
108 - val_accuracy: 0.9350
Epoch 279/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9628 - val_loss: 0.0
107 - val_accuracy: 0.9360
Epoch 280/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9632 - val_loss: 0.0
106 - val_accuracy: 0.9352
Epoch 281/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9622 - val_loss: 0.0
107 - val_accuracy: 0.9368
Epoch 282/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9626 - val_loss: 0.0
106 - val_accuracy: 0.9362
Epoch 283/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9624 - val_loss: 0.0
107 - val_accuracy: 0.9359
Epoch 284/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9631 - val_loss: 0.0
108 - val_accuracy: 0.9355
Epoch 285/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9629 - val_loss: 0.0
109 - val_accuracy: 0.9358
Epoch 286/1000

Epoch 286/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9629 - val_loss: 0.0
109 - val_accuracy: 0.9351
Epoch 287/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9631 - val_loss: 0.0
107 - val_accuracy: 0.9358
Epoch 288/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9631 - val_loss: 0.0
106 - val_accuracy: 0.9367
Epoch 289/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9631 - val_loss: 0.0
106 - val_accuracy: 0.9367
Epoch 290/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9628 - val_loss: 0.0
107 - val_accuracy: 0.9360
Epoch 291/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9629 - val_loss: 0.0
108 - val_accuracy: 0.9357
Epoch 292/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9619 - val_loss: 0.0
107 - val_accuracy: 0.9359
Epoch 293/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9627 - val_loss: 0.0
109 - val_accuracy: 0.9350
Epoch 294/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9632 - val_loss: 0.0
109 - val_accuracy: 0.9351
Epoch 295/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0063 - accuracy: 0.9619 - val_loss: 0.0
111 - val_accuracy: 0.9326
Epoch 296/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9631 - val_loss: 0.0
109 - val_accuracy: 0.9356
Epoch 297/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9638 - val_loss: 0.0
107 - val_accuracy: 0.9366
Epoch 298/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9633 - val_loss: 0.0
110 - val_accuracy: 0.9352
Epoch 299/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9626 - val_loss: 0.0
108 - val_accuracy: 0.9368
Epoch 300/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9631 - val_loss: 0.0
107 - val_accuracy: 0.9362
Epoch 301/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9625 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 302/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9626 - val_loss: 0.0
109 - val_accuracy: 0.9346
Epoch 303/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9634 - val_loss: 0.0
109 - val_accuracy: 0.9350
Epoch 304/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9637 - val_loss: 0.0
108 - val_accuracy: 0.9355
Epoch 305/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9635 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 306/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9635 - val_loss: 0.0
111 - val_accuracy: 0.9343
Epoch 307/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9627 - val_loss: 0.0
106 - val_accuracy: 0.9370
Epoch 308/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9639 - val_loss: 0.0
107 - val_accuracy: 0.9359
Epoch 309/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9634 - val_loss: 0.0
108 - val_accuracy: 0.9360
Epoch 310/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9634 - val_loss: 0.0
111 - val_accuracy: 0.9344
Epoch 311/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9622 - val_loss: 0.0
110 - val_accuracy: 0.9352

110 - val_accuracy: 0.9352
Epoch 312/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9644 - val_loss: 0.0
107 - val_accuracy: 0.9369
Epoch 313/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9629 - val_loss: 0.0
107 - val_accuracy: 0.9373
Epoch 314/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9639 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 315/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9631 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 316/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9634 - val_loss: 0.0
107 - val_accuracy: 0.9362
Epoch 317/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9646 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 318/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9636 - val_loss: 0.0
107 - val_accuracy: 0.9363
Epoch 319/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9629 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 320/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9642 - val_loss: 0.0
107 - val_accuracy: 0.9358
Epoch 321/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9628 - val_loss: 0.0
107 - val_accuracy: 0.9350
Epoch 322/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9640 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 323/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9633 - val_loss: 0.0
108 - val_accuracy: 0.9366
Epoch 324/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9642 - val_loss: 0.0
108 - val_accuracy: 0.9360
Epoch 325/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9651 - val_loss: 0.0
107 - val_accuracy: 0.9371
Epoch 326/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9628 - val_loss: 0.0
109 - val_accuracy: 0.9356
Epoch 327/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9637 - val_loss: 0.0
107 - val_accuracy: 0.9373
Epoch 328/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9634 - val_loss: 0.0
110 - val_accuracy: 0.9342
Epoch 329/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9633 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 330/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9640 - val_loss: 0.0
108 - val_accuracy: 0.9363
Epoch 331/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9632 - val_loss: 0.0
108 - val_accuracy: 0.9356
Epoch 332/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0062 - accuracy: 0.9632 - val_loss: 0.0
109 - val_accuracy: 0.9353
Epoch 333/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9641 - val_loss: 0.0
106 - val_accuracy: 0.9373
Epoch 334/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9640 - val_loss: 0.0
107 - val_accuracy: 0.9362
Epoch 335/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9637 - val_loss: 0.0
109 - val_accuracy: 0.9349
Epoch 336/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9646 - val_loss: 0.0
107 - val_accuracy: 0.9363
Epoch 337/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9643 - val_loss: 0.0

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375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9643 - val_loss: 0.0
105 - val_accuracy: 0.9376
Epoch 338/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0061 - accuracy: 0.9637 - val_loss: 0.0
108 - val_accuracy: 0.9363
Epoch 339/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9638 - val_loss: 0.0
107 - val_accuracy: 0.9358
Epoch 340/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9643 - val_loss: 0.0
112 - val_accuracy: 0.9343
Epoch 341/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9633 - val_loss: 0.0
108 - val_accuracy: 0.9364
Epoch 342/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9644 - val_loss: 0.0
108 - val_accuracy: 0.9356
Epoch 343/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9643 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 344/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9655 - val_loss: 0.0
108 - val_accuracy: 0.9366
Epoch 345/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9644 - val_loss: 0.0
107 - val_accuracy: 0.9369
Epoch 346/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9645 - val_loss: 0.0
106 - val_accuracy: 0.9377
Epoch 347/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9644 - val_loss: 0.0
106 - val_accuracy: 0.9372
Epoch 348/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9648 - val_loss: 0.0
106 - val_accuracy: 0.9373
Epoch 349/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9641 - val_loss: 0.0
108 - val_accuracy: 0.9355
Epoch 350/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9642 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 351/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9639 - val_loss: 0.0
108 - val_accuracy: 0.9353
Epoch 352/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9640 - val_loss: 0.0
108 - val_accuracy: 0.9354
Epoch 353/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9649 - val_loss: 0.0
109 - val_accuracy: 0.9354
Epoch 354/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9649 - val_loss: 0.0
107 - val_accuracy: 0.9365
Epoch 355/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9651 - val_loss: 0.0
109 - val_accuracy: 0.9348
Epoch 356/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9637 - val_loss: 0.0
109 - val_accuracy: 0.9343
Epoch 357/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9652 - val_loss: 0.0
108 - val_accuracy: 0.9353
Epoch 358/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9654 - val_loss: 0.0
107 - val_accuracy: 0.9373
Epoch 359/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9646 - val_loss: 0.0
107 - val_accuracy: 0.9377
Epoch 360/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9643 - val_loss: 0.0
107 - val_accuracy: 0.9367
Epoch 361/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9644 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 362/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9654 - val_loss: 0.0
110 - val_accuracy: 0.9352
Epoch 363/1000
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Epoch 363/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9648 - val_loss: 0.0
109 - val_accuracy: 0.9361
Epoch 364/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9651 - val_loss: 0.0
108 - val_accuracy: 0.9368
Epoch 365/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9647 - val_loss: 0.0
109 - val_accuracy: 0.9360
Epoch 366/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9652 - val_loss: 0.0
109 - val_accuracy: 0.9358
Epoch 367/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9656 - val_loss: 0.0
109 - val_accuracy: 0.9344
Epoch 368/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9651 - val_loss: 0.0
109 - val_accuracy: 0.9349
Epoch 369/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9649 - val_loss: 0.0
109 - val_accuracy: 0.9354
Epoch 370/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9639 - val_loss: 0.0
111 - val_accuracy: 0.9348
Epoch 371/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9642 - val_loss: 0.0
110 - val_accuracy: 0.9342
Epoch 372/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9653 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 373/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9651 - val_loss: 0.0
106 - val_accuracy: 0.9369
Epoch 374/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9644 - val_loss: 0.0
109 - val_accuracy: 0.9351
Epoch 375/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9643 - val_loss: 0.0
111 - val_accuracy: 0.9333
Epoch 376/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0060 - accuracy: 0.9638 - val_loss: 0.0
109 - val_accuracy: 0.9362
Epoch 377/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9651 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 378/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9653 - val_loss: 0.0
109 - val_accuracy: 0.9351
Epoch 379/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9648 - val_loss: 0.0
109 - val_accuracy: 0.9351
Epoch 380/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9651 - val_loss: 0.0
108 - val_accuracy: 0.9364
Epoch 381/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9659 - val_loss: 0.0
110 - val_accuracy: 0.9347
Epoch 382/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9652 - val_loss: 0.0
111 - val_accuracy: 0.9337
Epoch 383/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9660 - val_loss: 0.0
110 - val_accuracy: 0.9356
Epoch 384/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9660 - val_loss: 0.0
110 - val_accuracy: 0.9349
Epoch 385/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9647 - val_loss: 0.0
108 - val_accuracy: 0.9360
Epoch 386/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9655 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 387/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9649 - val_loss: 0.0
110 - val_accuracy: 0.9343
Epoch 388/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9655 - val_loss: 0.0
```

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108 - val_accuracy: 0.9357
Epoch 389/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9661 - val_loss: 0.0
107 - val_accuracy: 0.9373
Epoch 390/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9647 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 391/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9656 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 392/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9648 - val_loss: 0.0
109 - val_accuracy: 0.9351
Epoch 393/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9653 - val_loss: 0.0
109 - val_accuracy: 0.9350
Epoch 394/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9659 - val_loss: 0.0
111 - val_accuracy: 0.9342
Epoch 395/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9652 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 396/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9653 - val_loss: 0.0
106 - val_accuracy: 0.9368
Epoch 397/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9658 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 398/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9660 - val_loss: 0.0
108 - val_accuracy: 0.9361
Epoch 399/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9646 - val_loss: 0.0
106 - val_accuracy: 0.9375
Epoch 400/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9654 - val_loss: 0.0
110 - val_accuracy: 0.9361
Epoch 401/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9654 - val_loss: 0.0
109 - val_accuracy: 0.9353
Epoch 402/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9661 - val_loss: 0.0
108 - val_accuracy: 0.9357
Epoch 403/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9641 - val_loss: 0.0
109 - val_accuracy: 0.9348
Epoch 404/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9649 - val_loss: 0.0
110 - val_accuracy: 0.9346
Epoch 405/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9658 - val_loss: 0.0
108 - val_accuracy: 0.9366
Epoch 406/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9655 - val_loss: 0.0
111 - val_accuracy: 0.9344
Epoch 407/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9650 - val_loss: 0.0
109 - val_accuracy: 0.9352
Epoch 408/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9648 - val_loss: 0.0
110 - val_accuracy: 0.9347
Epoch 409/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9662 - val_loss: 0.0
109 - val_accuracy: 0.9361
Epoch 410/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9661 - val_loss: 0.0
110 - val_accuracy: 0.9347
Epoch 411/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9652 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 412/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 413/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0059 - accuracy: 0.9643 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 414/1000
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375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9653 - val_loss: 0.0
110 - val_accuracy: 0.9342
Epoch 415/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9650 - val_loss: 0.0
108 - val_accuracy: 0.9360
Epoch 416/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
108 - val_accuracy: 0.9360
Epoch 417/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9661 - val_loss: 0.0
108 - val_accuracy: 0.9357
Epoch 418/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9660 - val_loss: 0.0
107 - val_accuracy: 0.9375
Epoch 419/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9656 - val_loss: 0.0
107 - val_accuracy: 0.9366
Epoch 420/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9662 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 421/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9653 - val_loss: 0.0
108 - val_accuracy: 0.9364
Epoch 422/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9667 - val_loss: 0.0
108 - val_accuracy: 0.9367
Epoch 423/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9666 - val_loss: 0.0
109 - val_accuracy: 0.9364
Epoch 424/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9660 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 425/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9662 - val_loss: 0.0
108 - val_accuracy: 0.9361
Epoch 426/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9665 - val_loss: 0.0
107 - val_accuracy: 0.9372
Epoch 427/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9660 - val_loss: 0.0
107 - val_accuracy: 0.9374
Epoch 428/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9655 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 429/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
106 - val_accuracy: 0.9368
Epoch 430/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9667 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 431/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9664 - val_loss: 0.0
109 - val_accuracy: 0.9364
Epoch 432/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
109 - val_accuracy: 0.9348
Epoch 433/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9653 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 434/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 435/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9662 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 436/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9658 - val_loss: 0.0
109 - val_accuracy: 0.9358
Epoch 437/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9665 - val_loss: 0.0
109 - val_accuracy: 0.9362
Epoch 438/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9668 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 439/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
108 - val_accuracy: 0.9363
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Epoch 440/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9661 - val_loss: 0.0
106 - val_accuracy: 0.9362
Epoch 441/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9666 - val_loss: 0.0
106 - val_accuracy: 0.9373
Epoch 442/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9659 - val_loss: 0.0
108 - val_accuracy: 0.9361
Epoch 443/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9655 - val_loss: 0.0
112 - val_accuracy: 0.9341
Epoch 444/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
106 - val_accuracy: 0.9372
Epoch 445/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9658 - val_loss: 0.0
107 - val_accuracy: 0.9361
Epoch 446/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9668 - val_loss: 0.0
107 - val_accuracy: 0.9365
Epoch 447/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9667 - val_loss: 0.0
107 - val_accuracy: 0.9368
Epoch 448/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 449/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9663 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 450/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9662 - val_loss: 0.0
107 - val_accuracy: 0.9367
Epoch 451/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
108 - val_accuracy: 0.9367
Epoch 452/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9659 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 453/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9659 - val_loss: 0.0
109 - val_accuracy: 0.9360
Epoch 454/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
109 - val_accuracy: 0.9349
Epoch 455/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9657 - val_loss: 0.0
105 - val_accuracy: 0.9370
Epoch 456/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9665 - val_loss: 0.0
108 - val_accuracy: 0.9366
Epoch 457/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9663 - val_loss: 0.0
108 - val_accuracy: 0.9365
Epoch 458/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
108 - val_accuracy: 0.9350
Epoch 459/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9671 - val_loss: 0.0
106 - val_accuracy: 0.9367
Epoch 460/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
106 - val_accuracy: 0.9368
Epoch 461/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9668 - val_loss: 0.0
109 - val_accuracy: 0.9364
Epoch 462/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9656 - val_loss: 0.0
110 - val_accuracy: 0.9344
Epoch 463/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9665 - val_loss: 0.0
108 - val_accuracy: 0.9360
Epoch 464/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9660 - val_loss: 0.0
107 - val_accuracy: 0.9359
Epoch 465/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
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108 - val_accuracy: 0.9361
Epoch 466/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9658 - val_loss: 0.0
107 - val_accuracy: 0.9370
Epoch 467/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9668 - val_loss: 0.0
106 - val_accuracy: 0.9368
Epoch 468/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9663 - val_loss: 0.0
107 - val_accuracy: 0.9360
Epoch 469/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9678 - val_loss: 0.0
107 - val_accuracy: 0.9366
Epoch 470/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9665 - val_loss: 0.0
108 - val_accuracy: 0.9367
Epoch 471/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9661 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 472/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9666 - val_loss: 0.0
109 - val_accuracy: 0.9348
Epoch 473/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9660 - val_loss: 0.0
110 - val_accuracy: 0.9345
Epoch 474/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9663 - val_loss: 0.0
109 - val_accuracy: 0.9364
Epoch 475/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9672 - val_loss: 0.0
107 - val_accuracy: 0.9370
Epoch 476/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
106 - val_accuracy: 0.9380
Epoch 477/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9666 - val_loss: 0.0
108 - val_accuracy: 0.9352
Epoch 478/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
106 - val_accuracy: 0.9362
Epoch 479/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0058 - accuracy: 0.9657 - val_loss: 0.0
107 - val_accuracy: 0.9362
Epoch 480/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9671 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 481/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 482/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9681 - val_loss: 0.0
109 - val_accuracy: 0.9356
Epoch 483/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9675 - val_loss: 0.0
106 - val_accuracy: 0.9371
Epoch 484/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9671 - val_loss: 0.0
107 - val_accuracy: 0.9361
Epoch 485/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9666 - val_loss: 0.0
106 - val_accuracy: 0.9369
Epoch 486/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9670 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 487/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 488/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9663 - val_loss: 0.0
107 - val_accuracy: 0.9371
Epoch 489/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9668 - val_loss: 0.0
108 - val_accuracy: 0.9353
Epoch 490/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9659 - val_loss: 0.0
108 - val_accuracy: 0.9366
Epoch 491/1000
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375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9675 - val_loss: 0.0
106 - val_accuracy: 0.9380
Epoch 492/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9674 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 493/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9666 - val_loss: 0.0
109 - val_accuracy: 0.9348
Epoch 494/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9665 - val_loss: 0.0
107 - val_accuracy: 0.9375
Epoch 495/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9678 - val_loss: 0.0
109 - val_accuracy: 0.9343
Epoch 496/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9680 - val_loss: 0.0
109 - val_accuracy: 0.9362
Epoch 497/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
109 - val_accuracy: 0.9352
Epoch 498/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9676 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 499/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9676 - val_loss: 0.0
108 - val_accuracy: 0.9364
Epoch 500/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9666 - val_loss: 0.0
109 - val_accuracy: 0.9358
Epoch 501/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9669 - val_loss: 0.0
107 - val_accuracy: 0.9359
Epoch 502/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9666 - val_loss: 0.0
107 - val_accuracy: 0.9362
Epoch 503/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9668 - val_loss: 0.0
107 - val_accuracy: 0.9372
Epoch 504/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9675 - val_loss: 0.0
110 - val_accuracy: 0.9337
Epoch 505/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9676 - val_loss: 0.0
112 - val_accuracy: 0.9335
Epoch 506/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9668 - val_loss: 0.0
108 - val_accuracy: 0.9368
Epoch 507/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
108 - val_accuracy: 0.9372
Epoch 508/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9674 - val_loss: 0.0
108 - val_accuracy: 0.9357
Epoch 509/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9672 - val_loss: 0.0
108 - val_accuracy: 0.9366
Epoch 510/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
110 - val_accuracy: 0.9354
Epoch 511/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9681 - val_loss: 0.0
107 - val_accuracy: 0.9371
Epoch 512/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 513/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9671 - val_loss: 0.0
108 - val_accuracy: 0.9364
Epoch 514/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9666 - val_loss: 0.0
108 - val_accuracy: 0.9368
Epoch 515/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9671 - val_loss: 0.0
109 - val_accuracy: 0.9350
Epoch 516/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9663 - val_loss: 0.0
108 - val_accuracy: 0.9356
```

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Epoch 517/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9670 - val_loss: 0.0
107 - val_accuracy: 0.9374
Epoch 518/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9672 - val_loss: 0.0
109 - val_accuracy: 0.9365
Epoch 519/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9668 - val_loss: 0.0
107 - val_accuracy: 0.9380
Epoch 520/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9678 - val_loss: 0.0
108 - val_accuracy: 0.9354
Epoch 521/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9677 - val_loss: 0.0
110 - val_accuracy: 0.9350
Epoch 522/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9678 - val_loss: 0.0
108 - val_accuracy: 0.9368
Epoch 523/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9667 - val_loss: 0.0
107 - val_accuracy: 0.9373
Epoch 524/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
107 - val_accuracy: 0.9382
Epoch 525/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9681 - val_loss: 0.0
108 - val_accuracy: 0.9368
Epoch 526/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
108 - val_accuracy: 0.9356
Epoch 527/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9684 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 528/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9674 - val_loss: 0.0
109 - val_accuracy: 0.9353
Epoch 529/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9670 - val_loss: 0.0
108 - val_accuracy: 0.9364
Epoch 530/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9675 - val_loss: 0.0
108 - val_accuracy: 0.9364
Epoch 531/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
107 - val_accuracy: 0.9373
Epoch 532/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9679 - val_loss: 0.0
108 - val_accuracy: 0.9359
Epoch 533/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9670 - val_loss: 0.0
109 - val_accuracy: 0.9351
Epoch 534/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9674 - val_loss: 0.0
109 - val_accuracy: 0.9353
Epoch 535/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9675 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 536/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
110 - val_accuracy: 0.9342
Epoch 537/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9677 - val_loss: 0.0
109 - val_accuracy: 0.9352
Epoch 538/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0057 - accuracy: 0.9661 - val_loss: 0.0
107 - val_accuracy: 0.9367
Epoch 539/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9675 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 540/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9681 - val_loss: 0.0
108 - val_accuracy: 0.9372
Epoch 541/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9675 - val_loss: 0.0
108 - val_accuracy: 0.9373
Epoch 542/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9675 - val_loss: 0.0
```

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108 - val_accuracy: 0.9363
Epoch 543/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9667 - val_loss: 0.0
111 - val_accuracy: 0.9352
Epoch 544/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9669 - val_loss: 0.0
109 - val_accuracy: 0.9361
Epoch 545/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9682 - val_loss: 0.0
109 - val_accuracy: 0.9363
Epoch 546/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
107 - val_accuracy: 0.9367
Epoch 547/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9667 - val_loss: 0.0
109 - val_accuracy: 0.9352
Epoch 548/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9675 - val_loss: 0.0
107 - val_accuracy: 0.9366
Epoch 549/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9669 - val_loss: 0.0
108 - val_accuracy: 0.9352
Epoch 550/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
110 - val_accuracy: 0.9356
Epoch 551/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9684 - val_loss: 0.0
108 - val_accuracy: 0.9369
Epoch 552/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9678 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 553/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
112 - val_accuracy: 0.9339
Epoch 554/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
109 - val_accuracy: 0.9353
Epoch 555/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9678 - val_loss: 0.0
108 - val_accuracy: 0.9352
Epoch 556/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9679 - val_loss: 0.0
109 - val_accuracy: 0.9348
Epoch 557/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9670 - val_loss: 0.0
109 - val_accuracy: 0.9339
Epoch 558/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9681 - val_loss: 0.0
107 - val_accuracy: 0.9379
Epoch 559/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9676 - val_loss: 0.0
108 - val_accuracy: 0.9355
Epoch 560/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9669 - val_loss: 0.0
107 - val_accuracy: 0.9365
Epoch 561/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9676 - val_loss: 0.0
110 - val_accuracy: 0.9352
Epoch 562/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9662 - val_loss: 0.0
107 - val_accuracy: 0.9364
Epoch 563/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0
110 - val_accuracy: 0.9342
Epoch 564/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9677 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 565/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9671 - val_loss: 0.0
108 - val_accuracy: 0.9369
Epoch 566/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0
108 - val_accuracy: 0.9354
Epoch 567/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9676 - val_loss: 0.0
109 - val_accuracy: 0.9356
Epoch 568/1000
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375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9677 - val_loss: 0.0
109 - val_accuracy: 0.9363
Epoch 569/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9664 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 570/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9682 - val_loss: 0.0
109 - val_accuracy: 0.9347
Epoch 571/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9671 - val_loss: 0.0
109 - val_accuracy: 0.9352
Epoch 572/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9674 - val_loss: 0.0
109 - val_accuracy: 0.9357
Epoch 573/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0
109 - val_accuracy: 0.9352
Epoch 574/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0
110 - val_accuracy: 0.9353
Epoch 575/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9683 - val_loss: 0.0
108 - val_accuracy: 0.9354
Epoch 576/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 577/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
107 - val_accuracy: 0.9372
Epoch 578/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9672 - val_loss: 0.0
109 - val_accuracy: 0.9363
Epoch 579/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9674 - val_loss: 0.0
107 - val_accuracy: 0.9362
Epoch 580/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9678 - val_loss: 0.0
109 - val_accuracy: 0.9337
Epoch 581/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9678 - val_loss: 0.0
111 - val_accuracy: 0.9346
Epoch 582/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0
110 - val_accuracy: 0.9352
Epoch 583/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
109 - val_accuracy: 0.9344
Epoch 584/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9669 - val_loss: 0.0
109 - val_accuracy: 0.9362
Epoch 585/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9675 - val_loss: 0.0
108 - val_accuracy: 0.9360
Epoch 586/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
108 - val_accuracy: 0.9369
Epoch 587/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9679 - val_loss: 0.0
110 - val_accuracy: 0.9353
Epoch 588/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9668 - val_loss: 0.0
108 - val_accuracy: 0.9356
Epoch 589/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0
111 - val_accuracy: 0.9333
Epoch 590/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9674 - val_loss: 0.0
109 - val_accuracy: 0.9365
Epoch 591/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9679 - val_loss: 0.0
109 - val_accuracy: 0.9363
Epoch 592/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9682 - val_loss: 0.0
109 - val_accuracy: 0.9360
Epoch 593/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9676 - val_loss: 0.0
108 - val accuracy: 0.9363
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Epoch 594/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 595/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0
111 - val_accuracy: 0.9342
Epoch 596/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
109 - val_accuracy: 0.9348
Epoch 597/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9677 - val_loss: 0.0
108 - val_accuracy: 0.9363
Epoch 598/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0
109 - val_accuracy: 0.9350
Epoch 599/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9693 - val_loss: 0.0
110 - val_accuracy: 0.9356
Epoch 600/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9688 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 601/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0056 - accuracy: 0.9667 - val_loss: 0.0
112 - val_accuracy: 0.9336
Epoch 602/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9678 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 603/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0
109 - val_accuracy: 0.9357
Epoch 604/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9682 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 605/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9678 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 606/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 607/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9678 - val_loss: 0.0
112 - val_accuracy: 0.9337
Epoch 608/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
106 - val_accuracy: 0.9379
Epoch 609/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9677 - val_loss: 0.0
109 - val_accuracy: 0.9372
Epoch 610/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9673 - val_loss: 0.0
109 - val_accuracy: 0.9360
Epoch 611/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
108 - val_accuracy: 0.9367
Epoch 612/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9682 - val_loss: 0.0
109 - val_accuracy: 0.9361
Epoch 613/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 614/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9682 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 615/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9672 - val_loss: 0.0
110 - val_accuracy: 0.9352
Epoch 616/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9684 - val_loss: 0.0
107 - val_accuracy: 0.9366
Epoch 617/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9681 - val_loss: 0.0
108 - val_accuracy: 0.9366
Epoch 618/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9682 - val_loss: 0.0
105 - val_accuracy: 0.9388
Epoch 619/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9688 - val_loss: 0.0
```

106 - val_accuracy: 0.9385
Epoch 620/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
107 - val_accuracy: 0.9371
Epoch 621/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
110 - val_accuracy: 0.9345
Epoch 622/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9679 - val_loss: 0.0
109 - val_accuracy: 0.9367
Epoch 623/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9683 - val_loss: 0.0
108 - val_accuracy: 0.9369
Epoch 624/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0
109 - val_accuracy: 0.9364
Epoch 625/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0055 - accuracy: 0.9673 - val_loss: 0.0
110 - val_accuracy: 0.9350
Epoch 626/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
108 - val_accuracy: 0.9370
Epoch 627/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
109 - val_accuracy: 0.9352
Epoch 628/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9682 - val_loss: 0.0
108 - val_accuracy: 0.9365
Epoch 629/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9675 - val_loss: 0.0
109 - val_accuracy: 0.9350
Epoch 630/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9682 - val_loss: 0.0
108 - val_accuracy: 0.9371
Epoch 631/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9688 - val_loss: 0.0
109 - val_accuracy: 0.9367
Epoch 632/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9688 - val_loss: 0.0
109 - val_accuracy: 0.9367
Epoch 633/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
108 - val_accuracy: 0.9373
Epoch 634/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0
108 - val_accuracy: 0.9366
Epoch 635/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9691 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 636/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
108 - val_accuracy: 0.9376
Epoch 637/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0
111 - val_accuracy: 0.9350
Epoch 638/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0
112 - val_accuracy: 0.9347
Epoch 639/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
109 - val_accuracy: 0.9360
Epoch 640/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9682 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 641/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9682 - val_loss: 0.0
106 - val_accuracy: 0.9373
Epoch 642/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9679 - val_loss: 0.0
110 - val_accuracy: 0.9361
Epoch 643/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
108 - val_accuracy: 0.9355
Epoch 644/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9682 - val_loss: 0.0
108 - val_accuracy: 0.9373
Epoch 645/1000

Epoch 645/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0109 - val_accuracy: 0.9361
Epoch 646/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0110 - val_accuracy: 0.9354
Epoch 647/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9681 - val_loss: 0.0109 - val_accuracy: 0.9355
Epoch 648/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9678 - val_loss: 0.0109 - val_accuracy: 0.9362
Epoch 649/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0109 - val_accuracy: 0.9357
Epoch 650/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9676 - val_loss: 0.0109 - val_accuracy: 0.9358
Epoch 651/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9683 - val_loss: 0.0109 - val_accuracy: 0.9362
Epoch 652/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9682 - val_loss: 0.0110 - val_accuracy: 0.9356
Epoch 653/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9679 - val_loss: 0.0109 - val_accuracy: 0.9354
Epoch 654/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9681 - val_loss: 0.0109 - val_accuracy: 0.9348
Epoch 655/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9688 - val_loss: 0.0109 - val_accuracy: 0.9360
Epoch 656/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0110 - val_accuracy: 0.9345
Epoch 657/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0109 - val_accuracy: 0.9351
Epoch 658/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0109 - val_accuracy: 0.9374
Epoch 659/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0113 - val_accuracy: 0.9318
Epoch 660/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0110 - val_accuracy: 0.9359
Epoch 661/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0108 - val_accuracy: 0.9375
Epoch 662/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9692 - val_loss: 0.0109 - val_accuracy: 0.9364
Epoch 663/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9681 - val_loss: 0.0109 - val_accuracy: 0.9352
Epoch 664/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0111 - val_accuracy: 0.9340
Epoch 665/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9687 - val_loss: 0.0109 - val_accuracy: 0.9357
Epoch 666/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0109 - val_accuracy: 0.9370
Epoch 667/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0108 - val_accuracy: 0.9364
Epoch 668/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9674 - val_loss: 0.0110 - val_accuracy: 0.9352
Epoch 669/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9677 - val_loss: 0.0109 - val_accuracy: 0.9371
Epoch 670/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9683 - val_loss: 0.0108 - val_accuracy: 0.9363

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Epoch 671/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9683 - val_loss: 0.0
107 - val_accuracy: 0.9377
Epoch 672/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9690 - val_loss: 0.0
110 - val_accuracy: 0.9350
Epoch 673/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0
109 - val_accuracy: 0.9360
Epoch 674/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
109 - val_accuracy: 0.9347
Epoch 675/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 676/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9681 - val_loss: 0.0
109 - val_accuracy: 0.9357
Epoch 677/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9679 - val_loss: 0.0
107 - val_accuracy: 0.9362
Epoch 678/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
107 - val_accuracy: 0.9370
Epoch 679/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9683 - val_loss: 0.0
107 - val_accuracy: 0.9377
Epoch 680/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
110 - val_accuracy: 0.9352
Epoch 681/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9681 - val_loss: 0.0
110 - val_accuracy: 0.9356
Epoch 682/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
112 - val_accuracy: 0.9348
Epoch 683/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
112 - val_accuracy: 0.9335
Epoch 684/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
109 - val_accuracy: 0.9357
Epoch 685/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
112 - val_accuracy: 0.9344
Epoch 686/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9697 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 687/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9680 - val_loss: 0.0
112 - val_accuracy: 0.9346
Epoch 688/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
109 - val_accuracy: 0.9363
Epoch 689/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9688 - val_loss: 0.0
108 - val_accuracy: 0.9355
Epoch 690/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9693 - val_loss: 0.0
108 - val_accuracy: 0.9372
Epoch 691/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
108 - val_accuracy: 0.9376
Epoch 692/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
108 - val_accuracy: 0.9365
Epoch 693/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9701 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 694/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9691 - val_loss: 0.0
111 - val_accuracy: 0.9356
Epoch 695/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
110 - val_accuracy: 0.9354
Epoch 696/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
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375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
108 - val_accuracy: 0.9368
Epoch 697/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
111 - val_accuracy: 0.9346
Epoch 698/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
108 - val_accuracy: 0.9368
Epoch 699/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0
109 - val_accuracy: 0.9356
Epoch 700/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0
110 - val_accuracy: 0.9358
Epoch 701/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0
108 - val_accuracy: 0.9358
Epoch 702/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
111 - val_accuracy: 0.9352
Epoch 703/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9688 - val_loss: 0.0
110 - val_accuracy: 0.9365
Epoch 704/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9698 - val_loss: 0.0
109 - val_accuracy: 0.9369
Epoch 705/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9688 - val_loss: 0.0
109 - val_accuracy: 0.9363
Epoch 706/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9691 - val_loss: 0.0
107 - val_accuracy: 0.9365
Epoch 707/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
110 - val_accuracy: 0.9356
Epoch 708/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
112 - val_accuracy: 0.9331
Epoch 709/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0
110 - val_accuracy: 0.9364
Epoch 710/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
114 - val_accuracy: 0.9334
Epoch 711/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9680 - val_loss: 0.0
108 - val_accuracy: 0.9362
Epoch 712/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9683 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 713/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
108 - val_accuracy: 0.9370
Epoch 714/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9687 - val_loss: 0.0
109 - val_accuracy: 0.9354
Epoch 715/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9685 - val_loss: 0.0
109 - val_accuracy: 0.9354
Epoch 716/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9688 - val_loss: 0.0
109 - val_accuracy: 0.9360
Epoch 717/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9681 - val_loss: 0.0
111 - val_accuracy: 0.9348
Epoch 718/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
110 - val_accuracy: 0.9350
Epoch 719/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9675 - val_loss: 0.0
110 - val_accuracy: 0.9356
Epoch 720/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0
110 - val_accuracy: 0.9357
Epoch 721/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 722/1000

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Epoch 722/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9702 - val_loss: 0.0
109 - val_accuracy: 0.9355
Epoch 723/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9695 - val_loss: 0.0
111 - val_accuracy: 0.9342
Epoch 724/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9680 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 725/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9697 - val_loss: 0.0
110 - val_accuracy: 0.9367
Epoch 726/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0
108 - val_accuracy: 0.9377
Epoch 727/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
109 - val_accuracy: 0.9367
Epoch 728/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
110 - val_accuracy: 0.9350
Epoch 729/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
110 - val_accuracy: 0.9365
Epoch 730/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
112 - val_accuracy: 0.9353
Epoch 731/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9697 - val_loss: 0.0
109 - val_accuracy: 0.9360
Epoch 732/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 733/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9694 - val_loss: 0.0
109 - val_accuracy: 0.9358
Epoch 734/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9692 - val_loss: 0.0
111 - val_accuracy: 0.9346
Epoch 735/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
108 - val_accuracy: 0.9367
Epoch 736/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 737/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9679 - val_loss: 0.0
110 - val_accuracy: 0.9358
Epoch 738/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 739/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9690 - val_loss: 0.0
110 - val_accuracy: 0.9352
Epoch 740/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
110 - val_accuracy: 0.9349
Epoch 741/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9682 - val_loss: 0.0
113 - val_accuracy: 0.9336
Epoch 742/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
111 - val_accuracy: 0.9337
Epoch 743/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9684 - val_loss: 0.0
110 - val_accuracy: 0.9353
Epoch 744/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9687 - val_loss: 0.0
111 - val_accuracy: 0.9337
Epoch 745/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
109 - val_accuracy: 0.9352
Epoch 746/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
111 - val_accuracy: 0.9349
Epoch 747/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
113 - val_accuracy: 0.9336
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112 - val_accuracy: 0.9356
Epoch 748/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9686 - val_loss: 0.0
112 - val_accuracy: 0.9343
Epoch 749/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
113 - val_accuracy: 0.9342
Epoch 750/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
110 - val_accuracy: 0.9354
Epoch 751/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
110 - val_accuracy: 0.9357
Epoch 752/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9693 - val_loss: 0.0
111 - val_accuracy: 0.9356
Epoch 753/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
110 - val_accuracy: 0.9349
Epoch 754/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
110 - val_accuracy: 0.9345
Epoch 755/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
110 - val_accuracy: 0.9340
Epoch 756/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9686 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 757/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
113 - val_accuracy: 0.9324
Epoch 758/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9682 - val_loss: 0.0
112 - val_accuracy: 0.9352
Epoch 759/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 760/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
112 - val_accuracy: 0.9348
Epoch 761/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0054 - accuracy: 0.9675 - val_loss: 0.0
114 - val_accuracy: 0.9325
Epoch 762/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9687 - val_loss: 0.0
112 - val_accuracy: 0.9337
Epoch 763/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9693 - val_loss: 0.0
113 - val_accuracy: 0.9333
Epoch 764/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
112 - val_accuracy: 0.9341
Epoch 765/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9686 - val_loss: 0.0
111 - val_accuracy: 0.9342
Epoch 766/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
111 - val_accuracy: 0.9347
Epoch 767/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 768/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9685 - val_loss: 0.0
113 - val_accuracy: 0.9331
Epoch 769/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9689 - val_loss: 0.0
111 - val_accuracy: 0.9349
Epoch 770/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
112 - val_accuracy: 0.9353
Epoch 771/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
111 - val_accuracy: 0.9354
Epoch 772/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9695 - val_loss: 0.0
111 - val_accuracy: 0.9344
Epoch 773/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0

375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
111 - val_accuracy: 0.9347
Epoch 774/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
111 - val_accuracy: 0.9351
Epoch 775/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9683 - val_loss: 0.0
109 - val_accuracy: 0.9359
Epoch 776/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9686 - val_loss: 0.0
111 - val_accuracy: 0.9347
Epoch 777/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 778/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 779/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
113 - val_accuracy: 0.9336
Epoch 780/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
114 - val_accuracy: 0.9342
Epoch 781/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
111 - val_accuracy: 0.9350
Epoch 782/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
112 - val_accuracy: 0.9345
Epoch 783/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
114 - val_accuracy: 0.9335
Epoch 784/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9695 - val_loss: 0.0
112 - val_accuracy: 0.9345
Epoch 785/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
113 - val_accuracy: 0.9339
Epoch 786/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
113 - val_accuracy: 0.9335
Epoch 787/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 788/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 789/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
111 - val_accuracy: 0.9352
Epoch 790/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0
113 - val_accuracy: 0.9341
Epoch 791/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 792/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9683 - val_loss: 0.0
112 - val_accuracy: 0.9347
Epoch 793/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 794/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
115 - val_accuracy: 0.9323
Epoch 795/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 796/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9701 - val_loss: 0.0
112 - val_accuracy: 0.9346
Epoch 797/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9705 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 798/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
113 - val_accuracy: 0.9327
Epoch 799/1000

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Epoch 799/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9332
Epoch 800/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
113 - val_accuracy: 0.9340
Epoch 801/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9712 - val_loss: 0.0
113 - val_accuracy: 0.9333
Epoch 802/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
114 - val_accuracy: 0.9332
Epoch 803/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
114 - val_accuracy: 0.9337
Epoch 804/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9686 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 805/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9695 - val_loss: 0.0
113 - val_accuracy: 0.9334
Epoch 806/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
112 - val_accuracy: 0.9337
Epoch 807/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9701 - val_loss: 0.0
112 - val_accuracy: 0.9341
Epoch 808/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
112 - val_accuracy: 0.9336
Epoch 809/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
111 - val_accuracy: 0.9342
Epoch 810/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
111 - val_accuracy: 0.9344
Epoch 811/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9698 - val_loss: 0.0
112 - val_accuracy: 0.9337
Epoch 812/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9705 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 813/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 814/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9687 - val_loss: 0.0
114 - val_accuracy: 0.9329
Epoch 815/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
113 - val_accuracy: 0.9340
Epoch 816/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9699 - val_loss: 0.0
113 - val_accuracy: 0.9322
Epoch 817/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9702 - val_loss: 0.0
112 - val_accuracy: 0.9340
Epoch 818/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
111 - val_accuracy: 0.9345
Epoch 819/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 820/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9694 - val_loss: 0.0
112 - val_accuracy: 0.9341
Epoch 821/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
112 - val_accuracy: 0.9345
Epoch 822/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9702 - val_loss: 0.0
110 - val_accuracy: 0.9358
Epoch 823/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
110 - val_accuracy: 0.9355
Epoch 824/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
```

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110 - val_accuracy: 0.9358
Epoch 825/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9704 - val_loss: 0.0
112 - val_accuracy: 0.9341
Epoch 826/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9695 - val_loss: 0.0
109 - val_accuracy: 0.9362
Epoch 827/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9334
Epoch 828/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
111 - val_accuracy: 0.9342
Epoch 829/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9705 - val_loss: 0.0
112 - val_accuracy: 0.9343
Epoch 830/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
113 - val_accuracy: 0.9334
Epoch 831/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
113 - val_accuracy: 0.9345
Epoch 832/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9698 - val_loss: 0.0
110 - val_accuracy: 0.9348
Epoch 833/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9705 - val_loss: 0.0
111 - val_accuracy: 0.9345
Epoch 834/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9681 - val_loss: 0.0
113 - val_accuracy: 0.9327
Epoch 835/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9691 - val_loss: 0.0
112 - val_accuracy: 0.9358
Epoch 836/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9687 - val_loss: 0.0
111 - val_accuracy: 0.9347
Epoch 837/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
114 - val_accuracy: 0.9333
Epoch 838/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9693 - val_loss: 0.0
113 - val_accuracy: 0.9341
Epoch 839/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
111 - val_accuracy: 0.9344
Epoch 840/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
116 - val_accuracy: 0.9323
Epoch 841/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
112 - val_accuracy: 0.9348
Epoch 842/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9690 - val_loss: 0.0
111 - val_accuracy: 0.9349
Epoch 843/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9331
Epoch 844/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9686 - val_loss: 0.0
114 - val_accuracy: 0.9331
Epoch 845/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9701 - val_loss: 0.0
113 - val_accuracy: 0.9342
Epoch 846/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9691 - val_loss: 0.0
113 - val_accuracy: 0.9346
Epoch 847/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9686 - val_loss: 0.0
112 - val_accuracy: 0.9340
Epoch 848/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9705 - val_loss: 0.0
113 - val_accuracy: 0.9334
Epoch 849/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9695 - val_loss: 0.0
114 - val_accuracy: 0.9336
Epoch 850/1000
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375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9705 - val_loss: 0.0
113 - val_accuracy: 0.9332
Epoch 851/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
113 - val_accuracy: 0.9340
Epoch 852/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9693 - val_loss: 0.0
112 - val_accuracy: 0.9341
Epoch 853/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9695 - val_loss: 0.0
113 - val_accuracy: 0.9344
Epoch 854/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9693 - val_loss: 0.0
114 - val_accuracy: 0.9335
Epoch 855/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9342
Epoch 856/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9334
Epoch 857/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9710 - val_loss: 0.0
114 - val_accuracy: 0.9333
Epoch 858/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9689 - val_loss: 0.0
112 - val_accuracy: 0.9348
Epoch 859/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0053 - accuracy: 0.9685 - val_loss: 0.0
112 - val_accuracy: 0.9351
Epoch 860/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
113 - val_accuracy: 0.9341
Epoch 861/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9692 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 862/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9694 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 863/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9693 - val_loss: 0.0
112 - val_accuracy: 0.9352
Epoch 864/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
112 - val_accuracy: 0.9354
Epoch 865/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9692 - val_loss: 0.0
110 - val_accuracy: 0.9360
Epoch 866/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
113 - val_accuracy: 0.9347
Epoch 867/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
111 - val_accuracy: 0.9348
Epoch 868/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
113 - val_accuracy: 0.9339
Epoch 869/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
112 - val_accuracy: 0.9339
Epoch 870/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
111 - val_accuracy: 0.9353
Epoch 871/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9702 - val_loss: 0.0
113 - val_accuracy: 0.9334
Epoch 872/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9691 - val_loss: 0.0
115 - val_accuracy: 0.9323
Epoch 873/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9701 - val_loss: 0.0
111 - val_accuracy: 0.9352
Epoch 874/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9701 - val_loss: 0.0
112 - val_accuracy: 0.9351
Epoch 875/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
112 - val_accuracy: 0.9349
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Epoch 876/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9702 - val_loss: 0.0
112 - val_accuracy: 0.9346
Epoch 877/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9701 - val_loss: 0.0
113 - val_accuracy: 0.9341
Epoch 878/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 879/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
113 - val_accuracy: 0.9332
Epoch 880/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9333
Epoch 881/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9693 - val_loss: 0.0
114 - val_accuracy: 0.9332
Epoch 882/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9694 - val_loss: 0.0
113 - val_accuracy: 0.9325
Epoch 883/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
114 - val_accuracy: 0.9341
Epoch 884/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
112 - val_accuracy: 0.9343
Epoch 885/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
114 - val_accuracy: 0.9326
Epoch 886/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9706 - val_loss: 0.0
114 - val_accuracy: 0.9327
Epoch 887/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9699 - val_loss: 0.0
113 - val_accuracy: 0.9333
Epoch 888/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9693 - val_loss: 0.0
113 - val_accuracy: 0.9329
Epoch 889/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9702 - val_loss: 0.0
113 - val_accuracy: 0.9339
Epoch 890/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9693 - val_loss: 0.0
113 - val_accuracy: 0.9343
Epoch 891/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9706 - val_loss: 0.0
113 - val_accuracy: 0.9338
Epoch 892/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
113 - val_accuracy: 0.9342
Epoch 893/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
114 - val_accuracy: 0.9326
Epoch 894/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
112 - val_accuracy: 0.9338
Epoch 895/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
113 - val_accuracy: 0.9338
Epoch 896/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9707 - val_loss: 0.0
113 - val_accuracy: 0.9335
Epoch 897/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9331
Epoch 898/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9707 - val_loss: 0.0
114 - val_accuracy: 0.9339
Epoch 899/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
114 - val_accuracy: 0.9321
Epoch 900/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9695 - val_loss: 0.0
112 - val_accuracy: 0.9343
Epoch 901/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
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116 - val_accuracy: 0.9327
Epoch 902/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9694 - val_loss: 0.0
113 - val_accuracy: 0.9321
Epoch 903/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
112 - val_accuracy: 0.9341
Epoch 904/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
113 - val_accuracy: 0.9338
Epoch 905/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
113 - val_accuracy: 0.9329
Epoch 906/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9689 - val_loss: 0.0
112 - val_accuracy: 0.9337
Epoch 907/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
112 - val_accuracy: 0.9346
Epoch 908/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
111 - val_accuracy: 0.9353
Epoch 909/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9683 - val_loss: 0.0
114 - val_accuracy: 0.9323
Epoch 910/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9704 - val_loss: 0.0
114 - val_accuracy: 0.9332
Epoch 911/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 912/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
115 - val_accuracy: 0.9329
Epoch 913/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
115 - val_accuracy: 0.9336
Epoch 914/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9693 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 915/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
113 - val_accuracy: 0.9340
Epoch 916/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
112 - val_accuracy: 0.9350
Epoch 917/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9705 - val_loss: 0.0
116 - val_accuracy: 0.9332
Epoch 918/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
113 - val_accuracy: 0.9342
Epoch 919/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
113 - val_accuracy: 0.9339
Epoch 920/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
111 - val_accuracy: 0.9358
Epoch 921/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
113 - val_accuracy: 0.9346
Epoch 922/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
113 - val_accuracy: 0.9337
Epoch 923/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9706 - val_loss: 0.0
114 - val_accuracy: 0.9318
Epoch 924/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
112 - val_accuracy: 0.9354
Epoch 925/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9686 - val_loss: 0.0
112 - val_accuracy: 0.9345
Epoch 926/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9702 - val_loss: 0.0
115 - val_accuracy: 0.9327
Epoch 927/1000
```

```
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
113 - val_accuracy: 0.9352
Epoch 928/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
112 - val_accuracy: 0.9357
Epoch 929/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
115 - val_accuracy: 0.9325
Epoch 930/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9689 - val_loss: 0.0
113 - val_accuracy: 0.9348
Epoch 931/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9701 - val_loss: 0.0
113 - val_accuracy: 0.9336
Epoch 932/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9701 - val_loss: 0.0
112 - val_accuracy: 0.9352
Epoch 933/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9708 - val_loss: 0.0
112 - val_accuracy: 0.9352
Epoch 934/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
114 - val_accuracy: 0.9345
Epoch 935/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
111 - val_accuracy: 0.9347
Epoch 936/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9707 - val_loss: 0.0
110 - val_accuracy: 0.9358
Epoch 937/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9699 - val_loss: 0.0
111 - val_accuracy: 0.9346
Epoch 938/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9707 - val_loss: 0.0
110 - val_accuracy: 0.9356
Epoch 939/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9710 - val_loss: 0.0
113 - val_accuracy: 0.9348
Epoch 940/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9696 - val_loss: 0.0
112 - val_accuracy: 0.9353
Epoch 941/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
113 - val_accuracy: 0.9341
Epoch 942/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
112 - val_accuracy: 0.9340
Epoch 943/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9701 - val_loss: 0.0
111 - val_accuracy: 0.9352
Epoch 944/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9699 - val_loss: 0.0
111 - val_accuracy: 0.9350
Epoch 945/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9706 - val_loss: 0.0
112 - val_accuracy: 0.9337
Epoch 946/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9702 - val_loss: 0.0
112 - val_accuracy: 0.9339
Epoch 947/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9716 - val_loss: 0.0
113 - val_accuracy: 0.9339
Epoch 948/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9702 - val_loss: 0.0
113 - val_accuracy: 0.9345
Epoch 949/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
113 - val_accuracy: 0.9344
Epoch 950/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9690 - val_loss: 0.0
114 - val_accuracy: 0.9338
Epoch 951/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
112 - val_accuracy: 0.9337
Epoch 952/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9706 - val_loss: 0.0
113 - val_accuracy: 0.9344
```

```
Epoch 953/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9701 - val_loss: 0.0
113 - val_accuracy: 0.9342
Epoch 954/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9696 - val_loss: 0.0
116 - val_accuracy: 0.9317
Epoch 955/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
113 - val_accuracy: 0.9338
Epoch 956/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9697 - val_loss: 0.0
112 - val_accuracy: 0.9338
Epoch 957/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9698 - val_loss: 0.0
113 - val_accuracy: 0.9342
Epoch 958/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9706 - val_loss: 0.0
113 - val_accuracy: 0.9335
Epoch 959/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9697 - val_loss: 0.0
114 - val_accuracy: 0.9327
Epoch 960/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9702 - val_loss: 0.0
113 - val_accuracy: 0.9348
Epoch 961/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9700 - val_loss: 0.0
112 - val_accuracy: 0.9344
Epoch 962/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
112 - val_accuracy: 0.9361
Epoch 963/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9695 - val_loss: 0.0
115 - val_accuracy: 0.9325
Epoch 964/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9695 - val_loss: 0.0
114 - val_accuracy: 0.9332
Epoch 965/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9690 - val_loss: 0.0
112 - val_accuracy: 0.9348
Epoch 966/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
116 - val_accuracy: 0.9318
Epoch 967/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9705 - val_loss: 0.0
115 - val_accuracy: 0.9332
Epoch 968/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 969/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9704 - val_loss: 0.0
115 - val_accuracy: 0.9326
Epoch 970/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9704 - val_loss: 0.0
113 - val_accuracy: 0.9336
Epoch 971/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9695 - val_loss: 0.0
112 - val_accuracy: 0.9342
Epoch 972/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9693 - val_loss: 0.0
112 - val_accuracy: 0.9346
Epoch 973/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9694 - val_loss: 0.0
113 - val_accuracy: 0.9320
Epoch 974/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9709 - val_loss: 0.0
116 - val_accuracy: 0.9325
Epoch 975/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
114 - val_accuracy: 0.9337
Epoch 976/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
113 - val_accuracy: 0.9334
Epoch 977/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9710 - val_loss: 0.0
114 - val_accuracy: 0.9322
Epoch 978/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9708 - val_loss: 0.0
```

```
112 - val_accuracy: 0.9333
Epoch 979/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9709 - val_loss: 0.0
114 - val_accuracy: 0.9333
Epoch 980/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9699 - val_loss: 0.0
114 - val_accuracy: 0.9326
Epoch 981/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
114 - val_accuracy: 0.9333
Epoch 982/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9703 - val_loss: 0.0
113 - val_accuracy: 0.9334
Epoch 983/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9710 - val_loss: 0.0
112 - val_accuracy: 0.9351
Epoch 984/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
112 - val_accuracy: 0.9348
Epoch 985/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
113 - val_accuracy: 0.9340
Epoch 986/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9702 - val_loss: 0.0
111 - val_accuracy: 0.9355
Epoch 987/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9714 - val_loss: 0.0
113 - val_accuracy: 0.9336
Epoch 988/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0052 - accuracy: 0.9690 - val_loss: 0.0
112 - val_accuracy: 0.9352
Epoch 989/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
111 - val_accuracy: 0.9351
Epoch 990/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
110 - val_accuracy: 0.9362
Epoch 991/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9708 - val_loss: 0.0
113 - val_accuracy: 0.9338
Epoch 992/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9703 - val_loss: 0.0
111 - val_accuracy: 0.9346
Epoch 993/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9710 - val_loss: 0.0
115 - val_accuracy: 0.9325
Epoch 994/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9705 - val_loss: 0.0
113 - val_accuracy: 0.9342
Epoch 995/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9700 - val_loss: 0.0
114 - val_accuracy: 0.9325
Epoch 996/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0049 - accuracy: 0.9710 - val_loss: 0.0
111 - val_accuracy: 0.9357
Epoch 997/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9697 - val_loss: 0.0
112 - val_accuracy: 0.9345
Epoch 998/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9704 - val_loss: 0.0
112 - val_accuracy: 0.9351
Epoch 999/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0051 - accuracy: 0.9698 - val_loss: 0.0
113 - val_accuracy: 0.9348
Epoch 1000/1000
375/375 [==============================] - 1s 2ms/step - loss: 0.0050 - accuracy: 0.9704 - val_loss: 0.0
113 - val_accuracy: 0.9333
Model: "sequential_33"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
batch_normalization_7 (Batch (None, 784)               3136
_________________________________________________________________
dense_layer_100 (DenseLayer) (None, 10)                7850
_________________________________________________________________
dense_layer_101 (DenseLayer) (None, 10)                110
```

```
_________________________________________________________________
dense_layer_102 (DenseLayer) (None, 10)                110       
=================================================================
Total params: 11,206
Trainable params: 9,638
Non-trainable params: 1,568
_________________________________________________________________
```

### Debug the training (10 points)

A neural network with your initial setting may not work straightforwardly, so you will need to diagnose the problems in the training procedure. One strategy for getting insight into what's wrong is to plot the loss function and the accuracies on the training and validation sets during optimization.

Another strategy is to visualize the weights that were learned in the first layer of the network. In most neural networks trained on visual data, the first layer weights typically show some visible structure when visualized.

**Tuning**. Tuning the hyperparameters and developing intuition for how they affect the final performance is a large part of using Neural Networks. This task gives you a chance to gain some experience. Below, you should experiment with different values of the various hyperparameters, including

- data preparation (data normalization and data augmentation)
- the achitecture (depth, hidden layer sizes, and activation functions),
- optimization (optimization algorithm, learning rate, learning rate decay, batch size, and numer of training epochs)
- regularization (regularization weight, dropout).

**Expected results**. You goal in this exercise is to get as good of a result as you can, with a fully-connected Neural Network. Feel free implement your own techniques (e.g. PCA to reduce dimensionality, or adding dropout, or adding features to the solver, etc.). You should be aim to achieve a classification accuracy of greater than 80% on the test results.

**Grading**. You will get

- 5 points if your model has an accuracy over 0.70
- 8 points if your model has an accuracy over 0.80
- 10 points if your model has an accuracy over 0.90

In [74]:

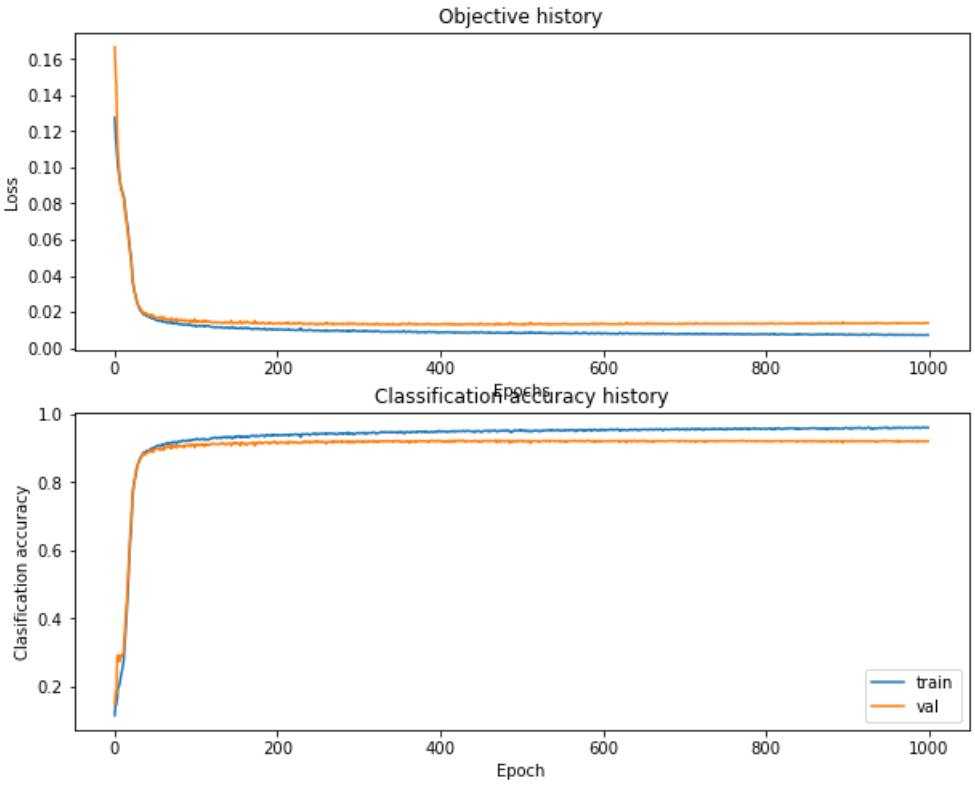
```
#debug
print(history.history.keys()) #only shows up as having "loss" and "val_loss", no accuracy or val_accuracy
```

```
dict_keys(['loss', 'accuracy', 'val_loss', 'val_accuracy'])
```

In [70]:

```
# Plot the loss function and train / validation accuracies
plt.subplot(2, 1, 1)
plt.plot(history.history['loss'], label='train')
plt.plot(history.history['val_loss'], label='val')
plt.title('Objective history')
plt.xlabel('Epochs')
plt.ylabel('Loss')

plt.subplot(2, 1, 2)
plt.plot(history.history['accuracy'], label='train')
plt.plot(history.history['val_accuracy'], label='val')
plt.title('Classification accuracy history')
plt.xlabel('Epoch')
plt.ylabel('Clasification accuracy')
plt.legend()
plt.show()
```




In [75]:

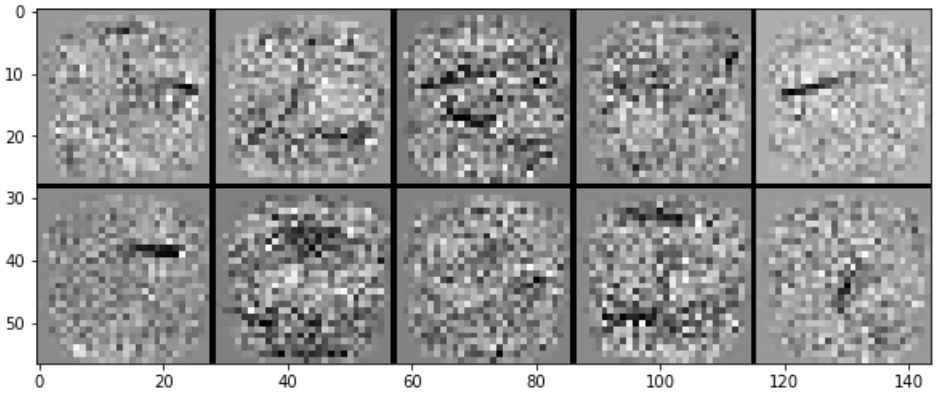
```
from vis_utils import visualize_grid

#was this
W1 = model.layers[1].W.numpy() #layer 0 is not batch norm
W1 = W1.transpose()
W1 = W1.reshape([W1.shape[0], 28, 28, 1])

plt.imshow(visualize_grid(W1))
```

Out[75]:

```
<matplotlib.image.AxesImage at 0x21905b172c8>
```



Finally, test the model on the test set and show the accuracy.

In [76]:

```
y_pred = model.predict(x_test.astype(np.float32))

acc = np.mean(np.argmax(y_test, axis=1) == np.argmax(y_pred, axis=1))

print('The test accuracy is ', acc)
```

```
The test accuracy is  0.9394
```

### Save the model

In [77]:

```
# Careful with this one...
model.save('mnist_cls.kmod')
```

```
INFO:tensorflow:Assets written to: mnist_cls.kmod\assets
```

## Question (5 points): what have you learned from this assignment?

Please summarize your model tuning experience into three points below. If possible, please elaborate after your summarization.

*Answer*:----------

1.) A network's ability to train a model is extremely dependant on selecting good hyperparameter values.

Learning rate: too small and can get stuck in local minima, too large and it will miss global minima Batch size: increasing batch size speeds up training but can hurt generalization from training data to validation data Number of neurons: more complex networks take longer to train but can more closely approximate some more complicated functions

2.) Different problems require different activation functions.

Regression tasks require both positive and negative outputs, therefore tanh is used as the final layer. Classification tasks require all output neurons ot sum to 1 (representing the relative probability of selecting each). Thus, the softmax function must be used. Relu activation functions seem to work best in the middle layers for most tasks.

3.) Batch normaliztion is important to make sure each layer is recieving inputs within a useful range

Because both sigmoid and tanh are "Squishing functions" all inputs greater than ~5 will yield similar outputs which will make learning progress slowly. This is referred to as the vanishing gradient problem. Relu has a similar problem where learning a large negative bias for a weight can cause the neuron to enter a "dead" state in which it will always output 0 and be unable to escape because all gradients will also be 0.